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Music and art as a hubs for transdisciplinarity: toward the achievement of the Sustainable Development Goals

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ABSTRACT

Exploring the intersection between art and education, this systematic literature review investigates how these disciplines can contribute to the achievement of the Sustainable Development Goals (hereafter SDGs) of the UN Agenda 2030, which seek to address the main challenges of the planet in its economic, social and environmental dimensions. The methodology implemented is based on the *Preferred Reporting Items for Systematic Reviews and Meta-Analysis* (PRISMA) protocol, focusing the study on Primary and Secondary Education levels. The results show ambiguity regarding the content of the SDGs and propose a transdisciplinary educational approach that integrates the arts and humanities. In this regard, it shows the need for curriculum reform that incorporates artistic and ecological perspectives to foster more meaningful and holistic learning that prepares students to act as responsible and proactive citizens in a changing world. Furthermore, it insists on the need for teacher training in appropriate methodologies for the effective inclusion of sustainability in all areas and levels of education. Finally, the need to continue with research work on the subject and the development of educational policies that integrate sustainability and art in order to respond to the challenges facing the planet is emphasized.

KEYWORDS

Art; Education; Music; Transdisciplinarity; SDGs

Introduction

Since the UN formulated the 17 Sustainable Development Goals (SDGs) and the 169 targets that flesh them out, numerous studies have highlighted the urgent need for profound transformations capable of confronting the unsustainable trajectories that characterize the world we live in Asplund et al. (2023). This need to "take the bold and transformative steps which are urgently needed to shift the world onto a sustainable and resilient path" (United States, 2015, p. 1) has been clearly refleced in the 2030 Agenda in force for the period 2016–2030. To this end, and mindful of the important role that education can play, the SDGs were integrated into United Nations Educational, Scientific, and Cultural Organization's Education for Sustainable Development (ESD) Roadmap ((United Nations Educational, Scientific and Cultural Organization, 2020)).

Although the majority of researchers agree on the importance of working on the SDGs through education, there are also some detractors, such as Kopnina (2020). In various studies this researcher shows her disbelief in economic development that does not lead to inequalities and a loss of biodiversity and natural resources. As she points out, sustainability is often confused with sustainable development, and the numerous texts that have been written on this subject do not indicate how to overcome poverty or hunger in the world or what is meant by equal or quality education. With regard to the latter, some authors (Battiste, 1998; Black, 2010; Kopnina, 2020) have pointed out the implicit tendency of the education system to be more responsive to the needs of the poor; they have pointed to the implicit tendency toward Eurocentric education, or even cognitive imperialism, namely "a form of cognitive manipulation used to discredit other knowledge bases and values and seeks to validate one source of knowledge and empower it through public education" (Battiste, 1998, p. 20). All these goals formulated by the UN are vague and imprecise for these authors, and they therefore oppose their inclusion in the education system as they are formulated. The lack of a logical order in the SDGs or the way in which the 169 goals are grouped together has also been criticized, albeit less strongly (Mika, 2017).

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This article has been corrected with minor changes. These changes do not impact the academic content of the article.

In the face of these opinions, which question their implementation or effectiveness, since the formulation of the SDGs, teaching and research on sustainability have focused primarily on subjects linked either to the natural sciences (Kueffer & Wiedmer, 2022) or to STEM disciplines (i.e. Science, Technology, Engineering and Mathematics), whether or not in conjunction with other subjects (Marcone, 2022). Some authors (Kueffer & Wiedmer, 2022) believe that, in addition to the need of interdisciplinary collaboration and globalization efforts, new educational programmes that embed sustainability, particularly in the art, humanities and social sciences, must be developed to meet the contemporary challenges posed by the implementation of the SDGs.

It is this group of arts-centred studies, using interdisciplinary methodologies, that we will focus on in the following pages. That is, research that focuses on the capacity of artistic languages and artistic experiences worked on in a cross-disciplinary way to develop critical thinking that is linked to the SDGs in students. The aim is for students to become interested in and try to understand the world in which we live and, from there, to reflect on the possibility of this "sustainable development" (Chapman & O'Gorman, 2022).

The benefit of addressing the SDGs in connection with the arts has been highlighted in numerous studies, because the arts provide opportunities to see the world in new ways and to imagine different futures (Wright, 2012). They are an effective means of inventing and also imagining different ways of approaching reality, of understanding and also of representing knowledge (Graham, 2021). Used as a pedagogical tool, they offer numerous benefits that are useful in teaching the SDGs. More specifically, Delacroix (2024) refers to the benefits of artistic language in fostering empathy with other people's experiences – – in the development of creativity, innovation or a collaborative mindset. In addition, it seeks to facilitate more meaningful and dynamic learning (Graham, 2021). It is this capacity of the arts that suggests that they can play a crucial role in supporting transformative education to help meet the challenges of the SDGs.

One possible approach to working on the SDGs in education is through the application of STEAM methodology, which brings together the usual characteristics of scientific disciplines –STEM– and the arts, namely the development of convergent and divergent thinking (Yakman & Lee, 2012). This integration between the sciences and the arts will not only help to understand the world we live in and its nuances, but will also respond to future demands for professionals, in a society where not only science experts but also people with a broad humanistic background will be needed (Hartley, 2017). As Bautista (2021) points out, the curriculum design following the STEAM methodology that is implemented admits certain variants: both interdisciplinary models in which at least two of the subjects of the acronym are integrated, as well as transdisciplinary models in which the objective set for students is the resolution of a starting problem. In any case, it is necessary to rethink education so that it is in line with the social challenges we face (Feito, 2020).

But it is not only the importance of the humanities and artistic activity in the development of the SDGs that has been highlighted, but also the role that music can play. Authors such as Emily Akuno highlight the importance of musical practice in this way (Vernia-Carrasco, 2021). But for this to happen, music must cease to be a product for the masses and instead become an integral part of transformative education (Guo et al., 2020). This would require rethinking the educational paradigm and embracing music education that includes methods and ideas from ecological thinking (Guo et al., 2020) that help to create a community in which individuals are ecologically responsible. It is in this environment that the modern concept of esthetic music education (Guo et al., 2020) has a place, which, away from the esthetic music education of Modernity, integrates musical ecology and ecological rationality.

Eisner (1995) warned, as Bauman and Mazzeo (Bauman, 2013) and many others would later do, that a purely scientific-technical education results in an incomplete education. And this results in a lack of development of critical thinking, a capacity that is necessary for living in democracy (Nussbaum, 2010), because democracy is based on respect and concern for others as well as care and responsibility for the environment.

Method

This paper seeks to answer the following research question: To what extent does the inclusion of art in primary and secondary education contribute to the achievement of the Sustainable Development Goals? To this end, a systematic review of the literature has been carried out, adopting the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) protocol framework (Page et al., 2021) as the organizational model to be followed, which ensures rigor and transparency in the process (Cacciamani et al., 2023). The essence of this research

requires the selection, analysis and synthesis of all relevant sources in a specific area and time interval to answer a research question. This method is characterized by following a set of strict and previously established procedures in order to minimize bias and provide more reliable results (Monge & Rodríguez Zambrano, 2024). Systematic reviews are imperative to consolidate existing knowledge, detect gaps in the current literature and set the direction for future research in order to derive objective and tangible answers through the integration of previous research (Grant & Booth, 2009).

The phases carried out within this process were heuristic and hermeneutic (Pastor, 2020). On the one hand, the heuristic phase refers to the carrying out of an exploratory search for bibliographic information to select relevant previous works on the subject of study. On the other hand, the hermeneutic phase involves the in-depth analysis of the works selected in the previous phase, establishing connections between the data extracted to draw conclusions that provide answers to the research objectives and questions (Pastor, 2020). For all these reasons, this review focuses on the analysis of the content of the texts in order to understand the extent to which art in primary and secondary education contributes to the achievement of the SDGs.

The studies selected for this review meet the following inclusion criteria: (1) they address the influence of art on the achievement of the Sustainable Development Goals within Primary and Secondary Education; (2) they were published between January 2015 (date of formulation of the SDGs) and March 2024; (3) they are written in English or Spanish; and (4) they are scientific articles that have undergone a double-blind peer review process. The exclusion criteria applied discard those studies that do not focus specifically on the aforementioned elements, as well as those articles that are not indexed in the databases selected for this research, which are: SCOPUS, Education Proquest (Education Database and ERIC) and Arts & Humanities Database. In addition, a manual review of references cited in the included studies was carried out to identify additional research that might meet the eligibility criteria.

As for the search strategy, it was designed to identify research that converges in the fields of art and sustainable development in the context of primary and secondary education. A combination of terms and descriptors related to "art", "education", "sustainable development" and "primary and secondary education" were used. Search terms were adapted to each database to take advantage of their specific thesauri and optimize the retrieval of relevant articles. An example search string used is: (("arts" OR "music") AND ("sustainable development goals" OR "SDGs") AND ("primary education" OR "secondary education")).

The identified studies were subjected to a two-stage selection process. In the first phase, an analysis of the titles, abstracts and keywords of the retrieved articles was carried out to determine their preliminary relevance according to the established criteria. In the second phase, the full texts of the shortlisted studies were examined in detail to confirm, or not, their eligibility. Figure 1 shows the flow chart resulting from this selection of studies according to the identification, screening and inclusion phases delimited by the PRISMA protocol. Thus, the initial number of documents selected was 448, of which a total of 10 were included after the screening and selection process described above.

The selection of articles began with a clear protocol to ensure that only relevant and high quality studies are included (Booth et al., 2016). This was followed by iterative and reflective reading of the texts to facilitate the initial identification of key concepts and emerging patterns that underpin the initial categories (Thomas & Harden, 2008). Braun and Clarke (2006) propose a thematic analysis approach, where these categories are generated from the themes identified in the reading phase. This process is flexible and adaptable, allowing for adjustments as new articles are added. The coding process was then carried out. Saldana (2015) differentiates two stages in this process: the first, known as initial coding, involves exploring the texts openly to identify patterns and emerging themes; and the second, known as axial coding, in which the relationships between the categories identified during the initial coding are analyzed. This two-stage methodology provides a robust framework for the analysis of qualitative data in a variety of research contexts (Saldana, 2015). Initial coding allows researchers to dive into the data without bias, while axial coding facilitates a deeper understanding of the interconnectedness between identified categories.

The next step was to review and refine the categories through an iterative approach to integrate new perspectives and ensure that the categories are representative of the data (Miles et al., 2013). This was followed by a repeated pattern analysis that involved looking for connections, frequencies and trends within the defined categories. Finally, the results are presented. Transparency in this step is crucial, as Creswell (2013) points out, to validate the rigorousness of the study and facilitate its replicability.

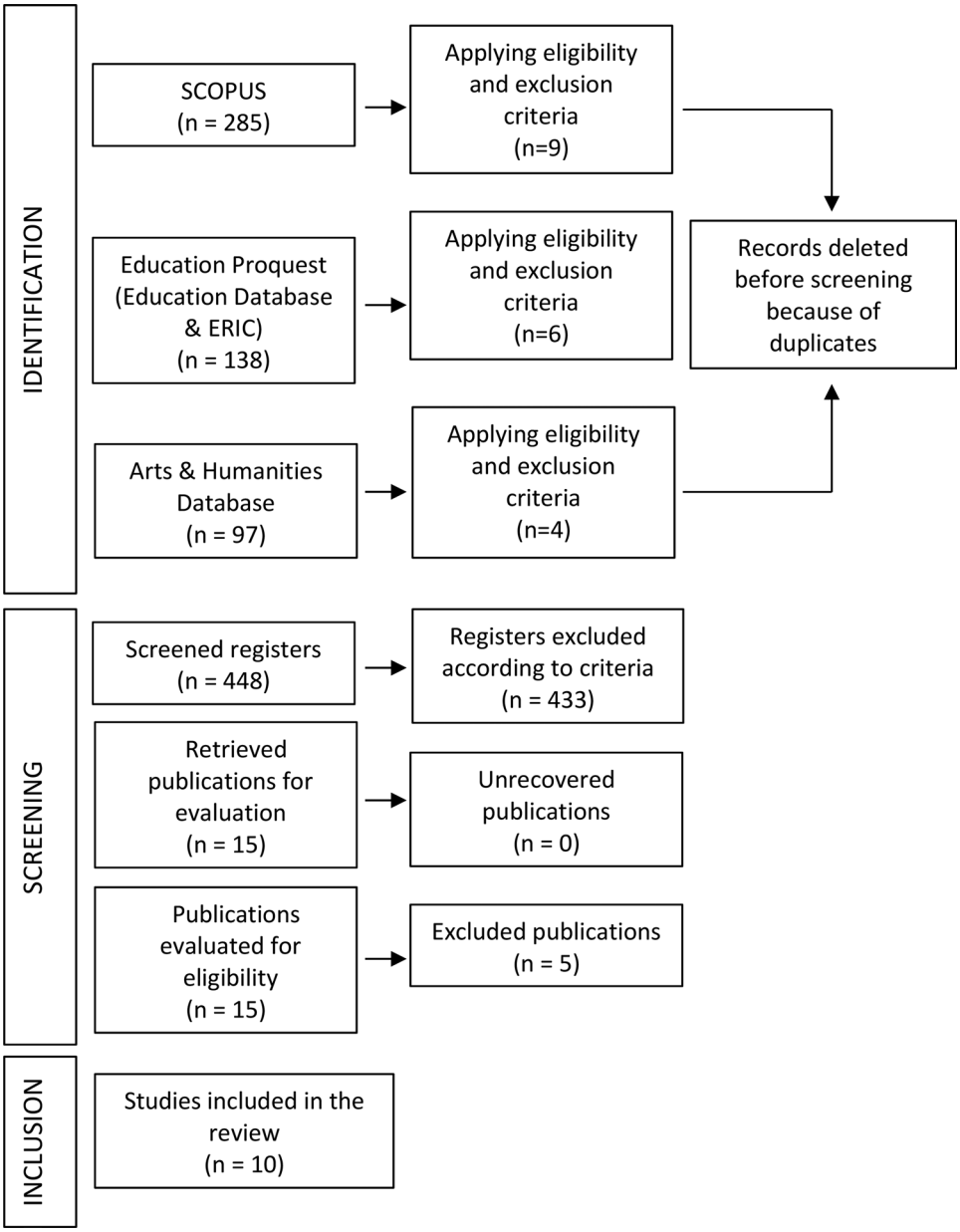

Figure 1. Declaration flowchart PRISMA.

Results

In this systematic literature review, several categories have been established to reflect the main themes and findings in the field of study. The effectiveness of using categorisations in systematic reviews is evidenced by research such as Page et al. (2021), who emphasize that clear and thematic structuring not only improves the interpretation of data, but also facilitates comparability and synthesis in systematic studies. The specific contributions of each category are detailed below, providing a clear and structured overview of progress and areas for further research. This approach not only optimizes the understanding and application of findings, but also sets clear guidelines for future research.

Educational curricula and/or syllabus

This section starts with an overview of the different needs for the integration of sustainability issues in the curricula of both primary and secondary education.

Berríos-Villarroel et al. (2021) provide a detailed analysis of the integration of sustainability into the Secondary Education curriculum in Chile, focusing on how four specific subjects (Visual Arts, Natural Sciences, Technology, History, Geography and Social

Sciences) address issues related to sustainable development. The study criticizes that the current implementation of these subjects is superficial and does not promote a deep and critical understanding of the real challenges of sustainability, limiting students' ability to actively engage and form informed opinions on environmental and social issues. Therefore, they emphasize a first need to focus on revising the curriculum to incorporate a variety of perspectives and foster interdisciplinarity that links subjects such as arts, science and technology. They highlight the option of enriching the curriculum with new perspectives that challenge traditional approaches (Mika, 2017), integrating sustainability effectively, promoting inclusive pedagogical approaches and adapting an interdisciplinary approach that fosters new perspectives in education (Walshe et al., 2020). Some authors, such as Guo et al. (2020), focus this necessary curriculum change on the incorporation of ecological rationality, esthetic education and musical ecology to promote an innovative educational model that integrates music and esthetic education for personal development in balance with a sustainable environment. They suggest that music education should not only be a utilitarian product of the consumer society, but should also play an important role in achieving the SDGs by promoting an ecological and esthetic approach that nurtures a new generation to live in harmony with nature. To achieve this, these authors highlights the need for a curricular transformation that integrates sustainability effectively, not only in the natural sciences but also in the arts and technology, underlining the importance of adopting pedagogical methods that encourage debate, critique and a holistic understanding of global and local challenges (Mika, 2017). It is therefore proposed to adopt an interdisciplinary approach linking arts subjects with sustainability, enhancing collaboration and creativity, understood as essential skills in a sustainable development context (Guo et al., 2020).

Jones et al. (2022) argue that the reform of the educational approach must move toward a more holistic and multidisciplinary perspective. By focusing on students' life experiences and connecting them to global environmental issues, deeper and more personalized collective learning is encouraged. By using the arts as a vehicle for exploring and expressing sustainability issues, students become experts on their own environment, which is essential for fostering active and conscious ecological citizenship. This interdisciplinary approach, combining esthetic education with ecological rationality, fosters collaboration, creativity and critical capacity, key skills in a sustainable development context.

Next, and focusing on another need in the field of teaching methods, there is an urgent need to implement active and participatory methodologies that lead students to reflect on everything related to sustainability (Berríos-Villarroel et al., 2021). In this context, Henze et al. (2022) study how schools explore strategies to foster the 4Cs (Creativity, Cooperation, Communication and Critical Thinking) in students through the use of STEAM methodologies and digital tools. Thus, they focus their proposal on connecting Robotics and Artificial Intelligence (AI) with the SDGs by implementing an educational model that extends the five phases of the so-called 5E Model (Engagement, Exploration, Explanation, Elaboration and Evaluation according) (Henze et al., 2022) with an additional phase called: Exchange. This new phase allows students to reflect on what and how they have learned and facilitates the collection of students' learning experiences. The findings of Henze et al. (2022) suggest that the introduction of STEAM methodology in this 5E model with this additional phase is a solid basis for implementing these approaches with the help of digital creativity tools because it reinforces the 4Cs and prepares students to face challenges, aligning with the critical need to transform the school curriculum to incorporate sustainability effectively. Furthermore, this model is considered inclusive and interdisciplinary by connecting various disciplines such as robotics or AI with sustainability, seeking to enhance student collaboration and creativity (Mika, 2017).

Another proposal focuses on conducting continuous evaluation of the curriculum through ongoing empirical research to adapt and improve educational approaches to sustainability, ensuring that they remain relevant and effective in the face of the changing challenges of sustainable development (Mika, 2017). In this regard, Walshe et al. (2020) focus this research need to assess how interactions with artists and the creative process itself can improve student wellbeing, from the perspective of the learners themselves. Thus, this research explores how integrating nature-based art projects for children can foster children's wellbeing by promoting confidence and creativity. Their findings suggest that not only do they benefit the emotional wellbeing of learners, but they may also be beneficial for those from disadvantaged backgrounds or with special educational needs, providing opportunities to interact meaningfully with their environment. This is based on the premise that outdoor exposure contributes to the development of emotional wellbeing in children, through activities such as imaginative play, risk-taking, empowerment and the development of empathy (Walshe et al., 2020). Thus, arts practices in

natural settings can have a significant positive impact on children's well-being and contribute to addressing illnesses such as depression and anxiety, in line with the SDGs (Walshe et al., 2020). This future research is thus crucial as there is little evidence of strategies that promote such emotional wellbeing through the combination of nature and art (Walshe et al., 2020).

Teacher training

In the analyzed works, references are made to both the professional development of in-service teachers and to the initial training of pre-service teachers. This training insists on the incorporation of a holistic approach to teaching. In this regard, Guo et al. (2020) state that although some subjects offer a holistic view of sustainable development, their learning is limited by the lack of methodologies that promote problematisation and discussion on sustainable development paradigms. Therefore, the importance of training teachers in new methodological approaches is stressed, as well as the need to continuously evaluate and improve pedagogical methods to maintain their relevance and effectiveness (Berríos-Villarroel et al., 2021; Guo et al., 2020). This limitation suggests that teacher education is not fully aligned with the needs of education for critical and active sustainability (Guo et al., 2020). Therefore, the development of a new educational paradigm integrating elements such as ecological rationality, esthetic education and musical ecology is called for to enable students to effectively question and discuss sustainability issues (Guo et al., 2020). In this regard, teacher education programmes need to be revised to include and emphasize these critical competencies, allowing for a more holistic and effective approach to sustainability (Henze et al., 2022).

Jones et al. (2022) advocate for an integrated and contextualized approach to climate change education in contemporary teacher training programmes, with a particular focus on fragile ecosystems. Their model proposes three essential phases in the training of pre-service teachers: concept building, experiential learning and community development. This approach transcends traditional didactic strategies and leverages arts-based pedagogy to foster a holistic and multidisciplinary understanding of environmental issues (Jones et al., 2022). Therefore, this paper suggests that teacher education should incorporate local knowledge and students' lived experiences as a basis for learning, promoting an educational dialogue that not only relies on conventional school resources, but also integrates the community and the natural environment as key elements in teaching. It therefore highlights the importance for teacher education programmes to expand their support for the development of disciplinary knowledge beyond teachers of science subjects, integrating pedagogical practices that foster ecological citizenship through inclusive and dialogical approaches (Jones et al., 2022). This pedagogical model not only seeks to enable trainee teachers to see educational activities as processes in which learners are co-creators of knowledge, but also highlights the need for a hands-on, community-based approach to teaching about climate change, which can be vital in fostering environmentally aware and active future citizens (Jones et al., 2022).

Discussion

This systematic literature review highlights some problems arising from the implementation of the SDGs in the field of education. These difficulties are in line with the technical limitations and criticisms already pointed out by the international community and collected by authors such as Gómez Gil (2018). In this regard, it should be noted that the countries involved in the 2030 Agenda have not received clear and precise instructions on how to implement it, a fact that encourages the emergence of both obstacles to the effective implementation of the SDGs and discrepancies between countries when implementing and putting them into practice in all areas (Gómez Gil, 2018), including education.

Firstly, these results point to the need to regularly review educational curricula in order to integrate sustainability more deeply into them. This requirement is paramount at all levels, including higher education (Leal et al., 2023), and arises from the neglect of curricula, which limits the quality of teaching (Sayed & Moriarty, 2020). This need necessarily implies that: (1) students build a clear critical and less trivial view of sustainability (Berríos-Villarroel et al., 2021); (2) interdisciplinarity and curricular multidisciplinarity are fostered (Berríos-Villarroel et al., 2021; Jones et al., 2022; Walshe et al., 2020); (3) traditional approaches are challenged by including new active methodologies (Berríos-Villarroel et al., 2021; Henze et al., 2022; Mika, 2017); and (4) educational models include music and esthetic education in line with a sustainable context in the natural environment closest to the students (Guo et al., 2020; Jones et al., 2022; Walshe et al., 2020).

Regarding the first item, which refers to a critical view of sustainability, Leiva-Brondo et al. (2021) have

noted that students' approach to this concept is not very clear, which makes it difficult for them to understand the SDGs. In this regard, the authors assessed the knowledge of the SDGs in Primary School students, concluding that their understanding of the SDGs is at average levels, which is why they consider that literacy in this area still has ample room for improvement (Leiva-Brondo et al., 2021). In relation to this, Gómez Gil points out that both the SDGs and their accompanying targets have an "extraordinarily weak, vague and imprecise vocabulary", sometimes containing very ambiguous terms that hinder their understanding (2018, p. 113). At the same time, SDGs present idealistic issues, which does not facilitate their fulfillment either (Gómez Gil, 2018). Indeed, it is acknowledged that the connection of the SDGs to education could be much better articulated (Unterhalter, 2019) and that the various linkages of some goals to others creates ambiguity, which makes it difficult to relate them to educational learning outcomes (Kioupi & Voulvoulis, 2019).

With regard to the imperative need to promote interdisciplinarity between the different curricular subjects in primary and secondary education, as pointed out by Berríos-Villarroel et al. (2021), Jones et al. (2022) and Walshe et al. (2020), other authors (e.g. Christ & Burritt, 2019) stress that, even in higher education it is essential for university academics to work together to find holistic solutions to the SDG problems. It is only from this perspective of working across disciplines that the gap between the purely theoretical aspects of sustainable development and its practical application can be bridged. Thus, interdisciplinarity and multidisciplinarity are conceived as central axes from which to build knowledge on the SDGs (de Oliveira & Garcés, 2023).

Regarding the third and fourth elements of the outcomes, which refer to active methodologies and educational models that are aligned with the immediate context, it seems obvious that transformative pedagogies are needed and that only these have the capacity to promote sustainable development in schools (Taimur, 2020). Thus, for effective implementation of the SDGs, it is essential to equip teachers with pedagogical and methodological approaches that include active learning approaches in the real and near world (Taimur, 2020).

Our findings also point to the need for more teacher training in new approaches to achieving holistic pupil development (Berríos-Villarroel et al., 2021; Guo et al., 2020; Henze et al., 2022). In fact, several authors allude to the importance of teacher training in primary education in order to correctly implement the SDGs (Robles-Moral, 2021). Thus, teaching education becomes central to achieve the SDGs (Nnokam & Sule, 2017), an approach which is paramount in all countries. For example, Nakidien et al. (2021) highlight how the achievement of SDG 4–inclusive and equitable quality education and lifelong learning will remain elusive in Africa at both primary and secondary school levels because teachers need additional training. In this sense, one of the criticisms that the SDGs have received is linked to their ethnocentric vision, which aims to "place many advances "under the leadership of developed countries", as if they were a model for poor countries to follow and imitate" (Gómez Gil, 2018, p. 114).

Finally, it is imperative to continue research related to the SDGs and their integration at all levels of education. Despite being a topic of growing interest, as evidenced by a 74% annual increase in the volume of publications and a remarkable 171% increase in the total number of citations between 2016 and 2022 (Raman et al., 2024), the implementation of the SDGs is still incipient in the arts. As proof of this, it has only been possible to integrate 10 articles in this systematic review. Therefore, the importance of this line of research to identify and address the gaps that still affect the implementation of the SDGs in the educational context remains.

Conclusions

The systematic review reported in this paper has provided insights into how the arts can promote the achievement of the SDGs. Our findings underline the critical need to review and transform education curricula, at all stages, to effectively incorporate sustainability, ensuring a more holistic approach.

Evidence suggests that art plays a significant role in the development of critical and creative skills, facilitating students' deeper and more empathetic understanding of the world. The adoption of pedagogical methods involving esthetic music education, and the incorporation of ecological rationality, could be key to an education that not only informs, but also transforms.

The importance of interdisciplinary and transdisciplinary approaches, such as STEAM methodology, which link arts education with sustainability, enhancing collaboration and innovation, has also been highlighted. This integration is proposed as a necessary response to current demands for well-trained teachers, not only in science but also in humanistic competences, to face global challenges.

However, a notable disparity is identified in the effectiveness with which these approaches are being

implemented in different educational contexts, reflecting a variability in the understanding and implementation of the SDGs. Continued investment in research and teacher training is therefore recommended to ensure that teachers are able to deliver these new curricula and methodologies.

Finally, this study supports the view that an education that properly integrates the elements of sustainability and art not only enriches learning but also prepares students to participate as active and responsible citizens in an ever-changing world. Education policy makers and curriculum designers are asked to consider these findings in order to foster education that responds effectively and ethically to the global imperatives of sustainable development. Our continued existence on this planet is only possible if each person regards all other human beings as having equal rights and obligations.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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References

Asplund, T., Kall, A. S., & Uhrqvist, O. (2023). Creative arts for sustainability transformations. Exploring children's theater for the UN Sustainable Development Goals. *Elementa: Science of the Anthropocene*, *11*(1), 00124. https://doi.org/10.1525/elementa.2022.00124

Battiste, M. (1998). Enabling the autumn seed: Toward a decolonized approach to aboriginal knowledge, language, and education. *Canadian Journal of Native Education*, *22*(1), 16–27. https://doi.org/10.14288/cjne.v22i1.195792

Bauman, Z. (2013). *Sobre la educación en un mundo líquido: Conversaciones con Ricardo Mazzeo*. Paidós.

Bautista, A. (2021). STEAM education: Contributing evidence of validity and effectiveness. *Journal for the Study of Education and Development*, *44*(4), 755–768. https://doi.org/10.1080/02103702.2021.1926678

Berríos-Villarroel, A., Orellana-Fernández, R., & Bastías-Bastías, L. S. (2021). Desarrollo sostenible y currículo chileno de enseñanza secundaria: ¿Qué proponen los programas escolares? *Revista Electrónica Educare*, *25*(1), 1–23. https://doi.org/10.15359/ree.25-1.18

Black, C. (2010). *Schooling the world: The white man's last burden*. Documentary film. Lost People Films. www.schoolingtheworld.org

Booth, A., Papaioannou, D., & Sutton, A. (2016). *Systematic approaches to a successful literature review*. SAGE Publications.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Cacciamani, G. E., Chu, T. N., Sanford, D. I., Abreu, A., Duddalwar, V., Oberai, A., Kuo, C.-C. J., Liu, X., Denniston, A. K., Vasey, B., McCulloch, P., Wolff, R. F., Mallett, S., Mongan, J., Kahn, C. E., Sounderajah, V., Darzi, A., Dahm, P., Moons, K. G. M., & Hung, A. J. (2023). PRISMA AI reporting guidelines for systematic reviews and meta-analyses on AI in healthcare. *Nature Medicine*, *29*(1), 14–15. https://doi.org/10.1038/s41591-022-02139-w

Chapman, S. N., & O'Gorman, L. (2022). Transforming learning environments in early childhood contexts through the arts: Responding to the United Nations Sustainable Development Goals. *International Journal of Early Childhood*, *54*(1), 33–50. https://doi.org/10.1007/s13158-022-00320-3

Christ, K. A., & Burritt, R. L. (2019). Implementation of sustainable development goals: The role for business academics. *Australian Journal of Management*, *44*(4), 571–593. https://doi.org/10.1177/0312896219870575

Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publication.

de Oliveira, A. K. P., & Garcés, S. A. (2023). Metodologías activas e interdisciplinariedad como ejes de la construcción del conocimiento sobre los ODS: una experiencia en las asignaturas Dirección de Recursos Humanos y Dirección de la Producción. In A. Salas Vallina (Coord.), *Innovación docente en dirección de Recursos Humanos* (pp. 85–96). Tirant lo Blanch.

Delacroix, E. (2024). Raising marketing students' awareness of their role in achieving Sustainable Development Goals: An arts-and-crafts-based pedagogy. *Journal of Marketing Education*, 46(2), 97–109. https://doi.org/10.1177/02734753231209701

Eisner, E. W. (1995). *Educar la vision artística*. Paidós.

Feito, R. (2020). Este es el fin de la escuela tal como la conocemos. Unas reflexiones en tiempo de confinamiento. *Revista de Sociología de La Educación-RASE*, *13*(2), 156–163. https://doi.org/10.7203/RASE.13.2.17130

Gómez Gil, C. (2018). Sustainable Development Goals (SDGs): A critical review. *Papers in Ecosocial Relations and Global Change*, *140*, 107–118.

Graham, M. A. (2021). The disciplinary borderlands of education: Art and STEAM education. *Journal for the Study of Education and Development*, *44*(4), 769–800. https://doi.org/10.1080/02103702.2021.1926163

Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Information and Libraries Journal*, *26*(2), 91–108. https://doi.org/10.1111/j.14711842.2009.00848.x

Guo, M., Su, H., & Yue, L. (2020). Ecology-focused aesthetic music education as a foundation of the sustainable development culture. *Interdisciplinary Science Reviews*, *45*(4), 564–580. https://doi.org/10.1080/03080188.2020.1820154

Hartley, S. (2017). *The fuzzy and the techie: Why the liberal arts will rule the digital world*. Hartley Global.

Henze, J., Schatz, C., Malik, S., & Bresges, A. (2022). How might we raise interest in robotics, coding, artificial intelligence, STEAM and sustainable development in university and on-the-job teacher training? *Frontiers in Education*, *7*, 872637. https://doi.org/10.3389/feduc.2022.872637

Jones, V., Mitra, S., & Gupta, N. (2022). Climate change and sustainability education in India and the place for arts-based practice: Reflections from East Kolkata Wetlands. *London Review of Education*, *20*(1), 48. https://doi.org/10.14324/LRE.20.1.48

Kioupi, V., & Voulvoulis, N. (2019). Education for sustainable development: A systemic framework for connecting the SDGs to educational outcomes. *Sustainability*, *11*(21), 6104. https://doi.org/10.3390/su11216104

Kopnina, H. (2020). Education for the future? Critical evaluation of education for sustainable development goals. *Journal of Environmental Education*, *51*(4), 280–291. https://doi.org/10.1080/00958964.2019.1710444

Kueffer, C., & Wiedmer, C. (2022). Upscaling research and teaching on the Sustainable Development Goals in the arts, humanities, and social sciences. *GAIA – Ecological Perspectives for Science and Society*, *31*(1), 57–59. https://doi.org/10.14512/gaia.31.1.14

Leal, W., Lange, A., & Pires, J. H. P. (2023). An overview of the engagement of higher education institutions in the implementation of the UN Sustainable Development Goals. *Journal of Cleaner Production*, *386* 135694. https://doi.org/10.1016/j.jclepro.2022.135694

Leiva-Brondo, M., Ramos, A., Nebauer, S. G., & Lull Noguera, C. (2021). *A comparative study on the Sustainable Development Goals knowledge by primary school and university students* [Paper presentation]. ICERI2021 Proceedings (pp. 4329–4335). IATED.

Marcone, G. (2022). Humanities and social sciences in relation to Sustainable Development Goals and STEM education. *Sustainability*, *14*(6), 3279. https://doi.org/10.3390/su14063279

Mika, J. (2017). Education in the Sustainability Development Goals (2016-2030), sustainability in education. *Journal of Applied Technical and Educational Sciences*, *7*(4), 43–61. https://doi.org/10.24368/jates.v7i4.10

Miles, M. B., Huberman, A. M., & Saldaña, J. (2013). *Qualitative data analysis: A methods sourcebook* (3rd ed.). SAGE Publications.

Monge, M. E., & Rodríguez Zambrano, A. D. (2024). Discapacidad visual e inclusión escolar: una revisión sistemática con PRISMA y VOSviewer. *Ibero-American Journal of Education & Society Research*, *4*(1), 23–30. https://doi.org/10.56183/iberoeds.v4i1.649

Nakidien, T., Singh, M., & Sayed, Y. (2021). Teachers and teacher education: Limitations and possibilities of attaining SDG 4 in South Africa. *Education Sciences*, *11*(2), 66. https://doi.org/10.3390/educsci11020066

Nnokam, N. C., & Sule, H. (2017). Teachers education and Sustainable Development Goals in Nigeria: Problems and prospects. *International Journal of Scientific Research in Education*, *10*(4), 401–412.

Nussbaum, M. C. (2010). *Not for profit: Why democracy needs the humanities*. Princeton University Press.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., & Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ (Clinical Research ed.)*, *372*, n71. https://doi.org/10.1136/bmj.n71

Pastor, M. (2020). Heurística histórica y hermenéutica en tiempos de posverdad. *Filosofía y Letras. Revista de la Facultad de Filosofía y Letras de la Universidad Nacional Autónoma de México*, *3*, 1–18.

Raman, R., Lathabhai, H., Pattnaik, D., Kumar, C., & Nedungadi, P. (2024). Research contribution of bibliometric studies related to sustainable development goals and sustainability. *Discover Sustainability*, *5*(1), 7. https://doi.org/10.1007/s43621-024-00182-w

Robles-Moral, F. J. (2021). Learning about sustainability and SDG with future primary education teachers in initial training. *Social Sciences*, *10*(11), 409. https://doi.org/10.3390/socsci10110409

Saldana, J. (2015). *The coding manual for qualitative researchers* (3rd ed.). SAGE Publications.

Sayed, Y., & Moriarty, K. (2020). SDG 4 and the 'education quality turn': Prospects, possibilities, and problems. In A. Wulff (Ed.), *Grading goal four* (pp. 194–213). Brill. https://doi.org/10.1163/9789004430365_009

Taimur, S. (2020). Pedagogical training for sustainability education. In W. Leal, A. Azul, L. Brandli, P. Özuyar, & T. Wall, T. (Eds.), *Quality education. Encyclopedia of the UN Sustainable Development Goals* (pp. 611–621). Springer. https://doi.org/10.1007/978-3-319-69902-8_51-1

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*, *8*(1), 45. https://doi.org/10.1186/1471-2288-8-45

United Nations Educational, Scientific and Cultural Organization. (2020). Education for sustainable development: A roadmap. UNESCO.

United States. (2015). General Assembly. Resolution adopted by the General Assembly on 25 September 2015. UN.

Unterhalter, E. (2019). The many meanings of quality education: Politics of targets and indicators in SDG4. *Global Policy*, *10*(S1), 39–51. https://doi.org/10.1111/1758-5899.12591

Vernia-Carrasco, A. M. (2021). Entrevista a Emily Achieng Akuno por Ana M. Vernia. *ARTSEDUCA*, (30), 93–96. https://doi.org/10.6035/artseduca.6137

Walshe, N., Lee, E., & Smith, M. J. (2020). Supporting children's well-being with art in nature: Artist pedagogue perceptions. *Journal of Education for Sustainable Development*, *14*(1), 98–112. https://doi.org/10.1177/0973408220930708

Wright, S. (2012). Ways of knowing in the arts. In S. Wright (Ed.), *Children, meaning making and the arts* (2nd ed., pp. 1–29). Pearson.

Yakman, G., & Lee, H. (2012). Exploring the exemplary STEAM education in the US as a practical educational framework for Korea. *Journal of the Korean Association For Science Education*, *32*(6), 1072–1086. https://doi.org/10.14697/jkase.2012.32.6.1072