

RESEARCH REPORTS

Our World, Our Futures: Transforming Education Through Environmental and Sustainability Education

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ABSTRACT *Environmental and sustainability education is critical to the world we live in today. Our World, Our Futures, a small-scale, cross-cultural participatory study, explored what transformative environmental and global citizenship education might look like in primary schools across two contexts. The study aimed to explore how teachers innovate curriculum through a flexible, cross-curricular approach within the constraints of the existing formal school curriculum. Informed by a culturally situated, responsive approach to researching with students and teachers, the research team supported the teachers in developing learning activities that foregrounded the students' situated knowledge, ideas and concerns about the environment. The students were invited to create and share art and other texts reflecting their perspectives on local environmental issues, their aspirations for their future spaces and their active roles as global citizens. Teachers were invited to reflect on how, and the extent to which, ideas of global citizenship, environmental and sustainability education can be incorporated into the curriculum, exploring how the project supported teachers' pedagogical praxis, autonomy and professional learning. Through these activities, data such as teacher interviews, classroom observations and artefacts of student work were gathered. The data were analysed to identify ways in which students' cross-cultural dialogue developed along with teachers' pedagogical development in integrating transformative and contextually relevant pedagogical approaches for delivery of environmental and sustainability education. The findings demonstrate the complexities and challenges of collaborating across distances, cultures and time zones, and of using virtual platforms. Finally, the findings present curriculum development as a lived, dynamic and experimental process that develops teacher autonomy and professional learning.*

Keywords: Environmental and sustainability education, global citizenship education, pedagogical practices for transforming education, SDGs

Introduction

While the importance of environmental and sustainability education is widely recognised, there is a lack of evidence about what good classroom practice of such educational approaches might look like. UNESCO (2021) advocates for educational approaches which place students at the centre of the learning experience in order to enhance their intellectual, social, emotional and behavioural dimensions of learning, thereby empowering individuals to take action for a more sustainable future. Further, studies demonstrate that when teachers engage in environmental

and sustainability education pedagogies in their classrooms, they are able to use contextually contingent teaching strategies that are more meaningful for their students (Stevenson et al., 2013). The argument is to move away from a fixed, ‘one size fits all’ prescriptive curriculum to enable contemporary ideas of environmental and sustainability to be contextually incorporated into the curriculum. Such an approach to curriculum leads to students being exposed to powerful learning experiences that are meaningful to them.

In the Maldives, the importance of environmental and sustainability education, and global citizenship education, is stated in the National Curriculum Framework (NCF) (NIE, 2011). One of the visions of the NCF is to develop students who are “responsible and productive contributors to their own family, local community and the global society” (NIE, 2011, p. 8). Further, the key competencies in the school curriculum of using sustainable practices and relating to people are directly related to the concepts of sustainability education and global citizenship education (NIE, 2011). Additionally, the current National Strategic Action Plan (SAP) of the Maldives also highlights the importance of sustainability education and global citizenship education, along with the teacher professional development needed to implement these actions (Government of Maldives, 2019). In particular, the need for innovations in teaching and learning practices is stated in Section 2.2 of the SAP.

This paper reports on a study conducted to explore how teachers can innovate curriculum through a flexible, cross-curricular approach to delivering environmental and sustainability education, within the constraints of the existing formal school curriculum. In particular, this study uses data from the project *Our World, Our Futures*, which brought together teachers and researchers in England and the Maldives to design, implement and evaluate an environmental and sustainability education project involving global citizenship education and cross-cultural communication through art and literacy.

The research objectives of the current paper are to:

- explore how teachers design and carry out classroom projects targeted at providing opportunities for the students to learn from one another about their local environments through learning activities based on students’ situated knowledge, ideas and concerns about the environment.
- examine how students express their understanding and perspectives of local environmental issues, their aspirations for their future spaces and their active roles as global citizens through art and other forms of texts.
- examine how, and the extent to which, teacher reflection, ideas of empathy, global citizenship and sustainability can be incorporated into the curriculum, by exploring how the process supports teachers’ pedagogical praxis, autonomy and professional learning.

Developing Environmental and Sustainability Education Curriculum

The role of education in developing an environmentally sustainable world is critical (Tikly, 2019). Tikly (2019) argues that such an education system must be developed based on a realistic analysis of the challenges facing the world in realising sustainable development and in transforming its education systems. Furthermore, school curricula that promote environmental and sustainability education are critical in the worldwide agenda of achieving the United Nations’ 17 Sustainable Development Goals (SDGs) by 2030. The SDGs are key global agendas that have been agreed upon by world leaders to promote a sustainable future for the world. Although SDG4 directly links to education, the role of education in achieving all 17 SDGs is paramount.

The traditional curriculum that is implemented in most school education systems is laden with top-down approaches to curriculum development, planning and implementation (Marsh & Willis, 1999). In such a curriculum there is limited room for teachers to innovate and teach key concepts around contextually emerging ideas such as the current context of environmental and sustainability education. Such a teacher-proof curriculum (Marsh & Willis, 1999) may have supported transferring knowledge in the pre-digital era when powerful knowledge drove the curriculum. However, in the context of the digital world we live in today, information and knowledge are easily accessible and deemed alternative approaches to school curriculum development and implementation (Voogt et al., 2011). Further, the importance of environment and sustainability education calls for alternative approaches to curriculum to forefront these concepts, skills and attitudes in our students. Such a curriculum should be connected with daily life, preparing students for future trends and new developments in our society (Elmas et al., 2014). Tilbury (1995) argues that such an approach to education addresses the immediate environmental issues while also addressing education for sustainability in the long term. Similarly, Ardoin et al. (2020) believe environmental education approaches create synergistic spaces for all, foregrounding local knowledge, experience, values and practices that prepare people to take informed actions on behalf of the environment. Thus, an approach to environmental and sustainability education should address the following (Tilbury, 1995).

- a. For reconciliation between economic development and environment conservation.
- b. To place an understanding of environmental concerns within a socio-economic and political context.
- c. To combine environmental and development concerns.

Environmental education and sustainability education are intertwined, one supporting the other (Agbedahin, 2019; Kopnina, 2012; Stevenson et al., 2013; Tilbury, 1995).

Numerous studies have investigated developing and implementing curricula that are focussed on environmental and sustainability education, demonstrating such an approach to curriculum design and development not only benefits the students and the local community but also supports teacher professional development and learning (Stevenson et al., 2013). Such a curriculum also stands to enhance teachers' pedagogical praxis by prompting innovative approaches for curriculum implementation (Sureda-Negre et al., 2014). A study in Tanzania demonstrated that while teachers understand the need to integrate environmental education into their curriculum, the existing formal curriculum is congested with facts that do not allow teachers much flexibility and time for exploring ideas about the environment, thus they need support to teach strategies that use local methods and be encouraged to apply them to fit their different contexts (Kimaryo, 2011). Similarly, Sukma et al. (2020) reported, from a study in Indonesia, that teachers' practices of implementing environmental education concepts by integrating across the subjects in the curriculum facilitate teachers' input to the curriculum restructuring in such a way that allows more time for implementing these ideas. An international study by Murphy et al. (2020) reported on the connection between sustainability and environmental education with teachers' professional development, as well as self-efficacy in sustainability education in their general approaches to pedagogical innovation. This study demonstrated that when teachers were given time to explore concepts of sustainability and environmental education their understanding and attitudes of sustainability and environmental issues changed positively. Further, the study also demonstrated how teacher professional development settings that allow teachers to put "knowledge into practice within a community of actively engaged

practitioners” (Smith, 2014, p. 3) supported a community of practitioners. The key to such approaches is providing teachers with opportunities to engage, implement and reflect on a range of environmental issues through inquiry-based science education pedagogies in their classrooms (Murphy et al., 2020).

Transforming Environmental Education Through Cross-Cultural Communication

Recent developments in environmental education show the benefits of cross-cultural communication in developing learners’ holistic understanding and the development of what they learn at school (Peng & Chen, 2023). The significance of providing opportunities for the exchange of information and communication facilitated and supported by technological advancements has also been noted in the literature (Scoffham, 2018). Cross-cultural communications have facilitated enhanced student learning through knowledge construction, the development of contextual understandings and the development of holistic perspectives concerning issues beyond the stand-alone curricula restricted within the classroom walls (Scoffham, 2018). Further, cross-cultural communication enables students to expand their worldviews and introduces them to experience “spaces, forms of living and ways of knowing”, and supports understanding beyond the learned stereotypical notions about others. This in turn enables students to take away real understanding from cultural exchanges (Scoffham, 2018, p.144).

Cross-cultural communication in learning also allows for active global citizenship and democratic participation (UNESCO, 2021). This approach supports expanding student learning from different cultural and social spaces. It is advocated that student learning should be connected through natural, built, virtual sites of learning allowing students the best learning from each modality (UNESCO, 2021). Such opportunities create the space for collective agency, intelligence and creativity through what is termed a new social contract for education, where participants understand, learn and accept the notions of being one and connected and interdependent with each other (UNESCO, 2021). Intercultural communication has become part of the pedagogy supporting the principles of cooperation and collaboration, where students develop the empathy and compassion required to work together for the collective good of everyone as global citizens (Pais & Costa, 2020). Uhlenwinkel (2017) described a cross-cultural study on understanding the Millennium Development Goals (MDG) and found that cross-cultural communication helped participants see things differently. Studies such as these suggest that cross-cultural communication may allow learners to acquire knowledge and think about things beyond what they already know, and help students develop empathy in general (Uhlenwinkel, 2017; Andreotti, 2014).

Technological advancements have brought in wider participation and instant global communication across cultures via social media and other digital platforms. It has been reported that such connectivities have brought environmental and sustainability education and learning closer to the everyday lives of children (Haleem et al, 2022). Further, digital technologies have enabled learner interaction in multiple ways. For example, communication is no longer only limited to ‘words’ but goes beyond verbal communication to include video and graphics communication channels and instant-messaging platforms for educational information (Haleem et al., 2022). Additional benefits of technology-enhanced learning include the development of teamwork and communication skills and collaboration towards solving issues students find concerning, such as climate change, biodiversity and catastrophe resilience (Haleem, et al, 2022).

Cross-cultural exchanges take students and their learning beyond the classroom and extend the learning spaces, especially through use of digital spaces (Haleem et al, 2022). Students are able to interact within a different space and form new understandings and learn how they relate to the world (Biesta, 2022). Furthermore, cross-cultural discussions enhance the level of reasoning by students (Morin et al., 2013). Through such exchanges, students learn to reflect and think critically about global interdependencies, develop an understanding of their own roles and make choices relevant to the global context (Scheunplug, 2010). A cross-cultural study on environmental risk perception conducted by Duan and Fortner (2010) suggested the benefits of this approach to environmental education. Their study highlighted student agreement on transparent communication in decision-making processes on topics related to the environment and the social economic development of countries, demonstrating the development of critical thinking skills and meta-cognitive skills through such communications.

Transforming Pedagogical Practices of Environmental and Sustainability Education

Learning experience drawing on the students' own environment, combined with effective ways of teaching, makes it easier for students to comprehend and build empathy for global issues. It is also important to incorporate students' life experiences, their voices and their prior knowledge and skills within the pedagogical approaches utilised in teaching environmental and sustainability education (Bourn et al., 2016). These pedagogical approaches should be complemented by opportunities for experiential learning that extend students' foundation of knowledge, giving them experience with the wider world and the people in it (Andreotti, 2014).

Further, these authors highlight that education for sustainable development should aim to raise awareness of issues within the context of the students' own environment. Environmental education is effective, therefore, when approaches that encourage critical and creative thinking are employed (Bourn et. al., 2016). Such approaches encourage analysis, evaluation and synthesis in teaching complex environmental issues such as climate change (Education Scotland, 2015). Sobel (2007) calls for place-based education as an approach where the local community is used as an entry point to teach concepts across the curriculum, allowing opportunities for hands-on experiences in real-world situations. This approach in turn contributes to the inculcation of values of global citizenship in students with pro-environmental thinking (Sobel, 2007).

The Programme for International Student Assessment (PISA) report by the OECD (2022) has highlighted that students are motivated to take action on environmental issues when their school peers and parents are involved in these kinds of issues. Furthermore, the report also stated that students participate in environmental projects and take action if they are in schools where other students are also taking part in such activities. Further, according to PISA's Global Competence Framework, students who have knowledge of global and intercultural issues are able to understand the perspectives of others, have an interest in other cultures and are better able to translate such positive attributes into actions that benefit their local communities and the world in which they live (Milfont & Sibley, 2012; OECD, 2018).

It has been argued that environmental education for sustainable development is best suited to exploration through art education (Sunassee, Bokhoree, & Patrizio, 2021). Tambling and Bacon (2023) state that art education enables

students to express their emotions and provides room to explore their identities while stimulating students' imaginations, as well as their cognitive and problem-solving skills. Art education also assists in developing key skills of global citizenship such as empathy, teamwork, problem-solving, experimentation, self-confidence, innovation, imagination and creativity (Sunassee, et al., 2021).

Through art education approaches students learn that there is more than one way to express themselves through art by appreciating and constructing various artworks inspired by famous artists and by their peers (Tambling & Bacon, 2023). The process of creating artwork is vital for communication, and also as a means of self-expression. The process has an important role in teaching young people about personal interpretation and how voicing views and opinions through different media can have a powerful impact (Tambling & Bacon, 2023). Thus, when using this approach for environmental and sustainability education and global citizenship education, teachers should ensure that safe spaces are created in which students can express their views (Lundy, 2007; Sunassee, et al., 2021).

Theoretical Framework: Transformative Learning Theory

Environmental and sustainability education centres around the ideologies of transforming learners' worldviews and actions. The theory of transformative learning – a theory based on the concepts of constructivism, humanist and critical social theory – offers potential for understanding and exploring how learners, both students and teachers, navigate their learning journeys in environmental and sustainability education (Grow & Almasi, 2011; Rodríguez Aboytes & Barth, 2020). Mezirow proposed this theory in 1985 to explore how adults learn and the theory has evolved into a strong field of education research, demonstrating the theory's viability in multiple contexts (Kitchenham, 2008). Considering the evolving nature of this theory, this study adopts the following definition of transformative learning:

learning that transforms problematic frames of reference – sets of fixed assumptions and expectations (habits of mind, meaning perspectives, mindsets) – to make them more inclusive, discriminating, open, reflective, and emotionally able to change.
(Based on Mezirow, 2003, p. 58).

This study adopts three dimensions of transformative learning theory, aligned with Mezirow (1997; 2003), to explore how teachers and students engage and learn about environmental issues via a flexible and innovative approach to environmental and sustainability education:

- a. Learning as a process – how people learn.
In this study this is explored through curriculum innovations and pedagogical approaches to environmental and sustainability education. In this aspect, this study looks at the planning and implementation processes of the curriculum.
- b. Learning outcomes – what people learn.
In this study this is explored through the learning students have acquired as well as the professional learning of the teachers in innovating the curriculum to integrate environmental and sustainability education via contextual and flexible pedagogical praxis. Transformative learning has been used to explain learning outcomes in school contexts for learners as well as for learning in professional development contexts (Alam, 2022; Rodríguez, Aboytes, & Barth, 2020).
- c. The learning conditions – how to best support their learning.
In this study this is explored through the classroom environment and the various teaching and learning arrangements that were made in the implementation of the curriculum and pedagogical approaches for environmental and sustainability education.

Additionally, this theory of learning encompasses the multifaceted and complex nature of learning (Kitchenham, 2008) and how individuals and their actions bring about learning. Such actions lead to autonomy, individuation empowerment, ecological consciousness, social action, global citizenship and democracy, and can be applied to learning in a diverse context (Rodríguez, Aboytes, & Barth, 2020).

Methodology

This study adopted a culturally situated, responsive approach to researching with students and teachers, forefronting teacher research methods (Cloonan, 2019; Cochran-Smith & Lytle, 1990; Mohr et al., 2004; Patton et al., 2015) that encouraged teacher autonomy, teacher collaboration and teacher professional learning. Check and Schutt (2011) have stated that teacher research is a broader label that describes all types of school and classroom-based research that is conducted by practitioners, within the broader ideals of teacher empowerment affirmed by teachers' stories, practices and voices.

The researchers and teachers in this study focussed on collaboratively developing learning activities that explored students' ideas and concerns about the environment and its future. Alongside the development and implementation of these activities, the development of teachers' pedagogies, curriculum innovations and environmental education practices were explored. Further, students' cross-cultural learning about global citizenship and the development of empathy and aspirations for the future were also explored via their artwork and their classroom engagements, both in-person and via digital platforms.

The project was implemented concurrently in three schools in the Maldives and four schools in England from January 2023 to July 2023. The students from both contexts were aged between seven and twelve years. From each school, one to three teachers, along with their students, joined this project. In the Maldives there were five teachers who participated, along with their students. Two schools had one teacher per school and the other school had three teachers participating. Supported by the research team and art educators, the teachers from seven schools planned, designed and carried out lessons aimed at providing the opportunity for the students to learn from one another about their local environments.

One of the key features of this project was the researchers' familiarity with the school contexts and the local environments. The England team had local researchers with knowledge of the school contexts and who had informal connections to England's participating schools. Similarly, in the Maldivian context, the researchers were Maldivians who spoke the local language (Dhivehi), were familiar with the participating school contexts and had previous formal and informal connections with the schools. For the researchers, such informal networks and connections help develop familiarity with the school contexts. Such relationships are an important feature in understanding the nuances of cultural contingencies in curriculum implementation and developing environmental pedagogies that promote teacher research and teacher professional development (Shiyama, 2020). The learning materials were shared between each team using a dedicated Moodle page and Padlets. Two online meetings of all the teachers and the research team were first held in order to orient the teachers to the project and introduce one another, while also providing support for each other and learning from each other's processes in the implementation of the lessons.

Since the research involved young students, careful attention was paid to both the procedural and situational ethical considerations, viewing the students as 'social actors and co-researchers' (Christensen & Prout, 2002). In the Maldivian context, following approval from both universities for the research, the Ministry

of Education's approval was sought to contact the schools, then the schools were contacted to seek their engagement. Once the approvals had been granted, the researchers approached the class teachers to inform them about the research. Following this, parents' consent and the students' consent to participate in this research was sought. As stated in the introduction, this paper uses the data from the Maldivian schools only.

According to Burnard, Apelgren and Cabaroglu (2015), teacher research allows multiple forms and types of data to be generated, including those from teachers, students and the research facilitators. Such diverse sources of data create a powerful and subjective landscape of school-based evidence of teacher and student learning (Mitchell, 2002). In this study the students were invited to create and share art and other texts about their perspectives on local environmental issues, their aspirations for their future spaces and their active roles as global citizens. Teachers were invited to reflect upon how, and the extent to which, ideas of empathy, global citizenship and sustainability can be incorporated into the curriculum. This allowed teachers to explore how the project supported teachers' pedagogical praxis, autonomy and professional learning. These activities generated data from both teachers and students. Unstructured interviews, lesson plans and planning discussions, along with teacher reflections, generated the teacher data. Student data include their artwork and lesson engagement data as recorded by the research team.

Since the corpus of data was situated within the contexts and time in which the lessons were conducted, it was important that each set of data be analysed by the local research team, with support from the teachers involved. Further, as each set of data was generated, they were initially analysed to inform the trajectory of the school activities supporting the evolving nature of the project itself (Jones, 2021). Such an approach to data analysis is critical in providing a nuanced understanding of teachers' development of environmental and sustainability education pedagogies, along with the values of global citizenship, while exploring students' learning trajectories. With this understanding, all the interviews were independently transcribed by the local team members and coded to identify themes that contributed to the research objectives. Next, the team members discussed the themes in order to compare and contrast them, highlighting findings common across the themes and those that stood out as context-specific. The multiplicity of the sources of data and the context-specific focus of the analysis allowed the researchers to interpret data that were contextually focussed and to understand the contextual data.

Findings and Discussion

To achieve the research objectives of this paper, the data from the Maldivian schools that participated in the project is used. The reason for focussing on this data is not only to understand the contextual nuances of the data but also to explore the contextually contingent nature of the curriculum and pedagogical innovations alongside students' learning. The three schools from the Maldives will be referred to anonymously as School 1 – a public school in Male', School 2 – a private school in Male', and School 3 – a public school in the Greater Male' region. What follows is a discussion of the findings under the identified themes as a means for environmental and sustainability education, and global citizenship education.

Contextually Contingent Diverse Pedagogies for Environmental and Sustainability Education

After the initial discussions with the whole team (the research team and the teachers from the Maldives and England), teachers proceeded with their lessons in their respective classrooms. Observations and discussions showed multiple and varied approaches used by different teachers.

For example, in one lesson conducted in School 3, the teacher decided to integrate a science lesson and social studies lesson from the curriculum to explore ideas of natural resources and the importance of using them sustainably. In the planning of the lesson, the teacher decided to keep the lesson flexible, open and student-centred through the use of group work and questioning techniques that engaged the students in discussions. The lesson was centred around a video that demonstrated some sustainable and unsustainable use of natural resources. The students were asked to provide reasons for various methods of use of natural resources shown in the video. In discussing the use of water, the 2014 water crisis in Male' was used as an example of how, even in a country surrounded by water, drinkable water shortages can impact daily lives. Despite the fact the students were too young to remember the crisis, their parents had discussed this crisis in their homes and students were aware of the incident. The discussion got students highly concerned about ensuring that they do not face such a crisis again. Students were eager to discuss this matter more at home with their parents and understand the crisis so that they as concerned citizens can do their part to make sure water is used wisely and sustainably at home and in school. These actions were put into posters, such as in Figure 1.

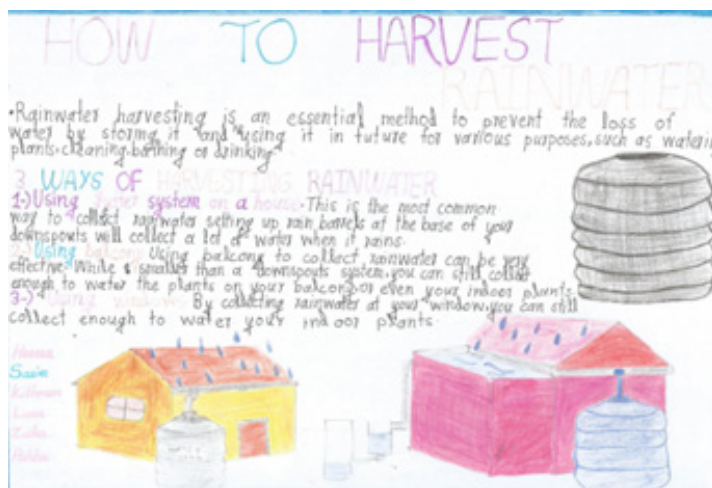


Figure 1: Sample student's artwork from the lesson on sustainability.

Such pedagogical approaches to using impactful examples from the environment and exploring them as case studies play a significant role in engaging students on environmental matters. This approach is in line with what Sobel (2004) termed "place-based education" where the local community and the environment are used as a starting point that enables the emphasis on hands-on, real-world learning experiences. Sobel (2004) argues that such an approach to education helps students develop stronger ties to their communities and enhances students' appreciation for the natural world, creating a heightened commitment to serving as active, contributing citizens. Further, Shiyama (2020) also highlights the importance of contextually contingent pedagogies to ground students' learning and make the

experiences more meaningful, and this is further asserted in the current study.

The students' commitment to discussing the water crisis and engaging in exploring ways to avoid such a catastrophe in the future demonstrates an awareness of their own agency and empowerment and a desire to help their communities – which are similar to the results reported as outcomes of Alam's (2022) environmental education study. Further, the form of learning process that the students experienced, together with the students' desire to take the discussion beyond the classroom, demonstrate transformative learning, as articulated by Rodríguez, et. al., (2020), because in this instance the students were willing to engage in self-reflection and further engage in courses of action and integrate these solutions in their lives.

In School 2 the teacher conducted a lesson about different places people live around the world and their conditions of living. In particular, a case study of people living in remote areas in Africa was used and their lifestyles were compared with those of developing countries. The students were shown videos of life in rural Africa and learnt how children living there had limited access to resources and opportunities for schooling. This lesson focused on using questioning and critical thinking to learn about people living in different contexts, prompting the exploration of similarities and differences in contexts that led to the development of empathy. Such a pedagogical approach is significant towards building global citizenship values among students, as argued by Pais and Costa (2020).

Overall, the findings from this study point towards the importance of using multiple pedagogical approaches that are suited to the contexts of students' lives and experiences. Such pedagogical approaches provide strong mechanisms for environmental and sustainability education that forefronts global citizenship values, as Tikly (2019) maintains.

The Role of Art-Based Pedagogy for Environmental and Sustainability Education

The art workshop held as part of the project activity was attended by students from two of the three participating schools. The theme of the art workshop was exploring materials from the environment to create a piece of artwork within a group. The pedagogical approach used by the art educator was informed by ideas of activism and critical reflection and critical thinking to promote environmental and sustainable practices. The students were motivated to learn more about the environment and explore the use of materials from the environment. Such an interest supported creative discussion in the group and the art-educators' prompts facilitated the students' explorations in a supportive and safe environment, despite the groups comprising students from two different schools. The use of mind maps to first brainstorm about the potential artwork created a supportive starting point for the students. The artworks focussed on where the student lived, how the spaces might look in the future and how they could be used in a more environmentally friendly way (see Fig. 2 for a sample). The interactions and the resulting artwork demonstrate that art-based education is a potential pedagogical approach that facilitates students to learn from one another. Such an approach stands to boost critical and creative thinking that encourages analysis, evaluation and synthesis in teaching complex environmental issues, as argued by Sunassee et Al. (2021). The findings from this study demonstrate that art-based approaches, together with student-centred pedagogical strategies, are powerful in enabling students to individually and in groups express themselves through multiple artforms, and this reiterates findings of Tambling and Bacon (2023).



Figure 2: Idea board created by students using materials found in the art workshop area.

Additionally, Alam (2022) explains that these forms of hands-on activities and experimenting with new approaches to environmental challenges facilitate social interaction and discourse in the form of conversation and reflective observation. Such an environment was created in the art workshop whereby discussions between the students and the art educator were productive and meaningful. The nature of the discussion had the purpose of creating the art piece while at the same time exploring the environment they were trying to portray through the artwork. The pedagogical approach the art educator used centred on questioning students' assumptions about how various materials in the environment can be used in creative artwork to give the material a voice. This approach prompted students to undergo transformative learning about the environment and in their dispositions about the materials in the environment. This learning was evident in how students approached using artwork in future lessons in this project. Such teaching approaches, according to Mezirow (2003), work because the discussions challenge the students' own strongly held views and support them to become more active and rational learners.

Cross-Cultural Communication in Developing Global Citizenship Values

As part of the project, one school from England and two schools from the Maldives met online to discuss and explore each other's environment through dialogue. In this online session the students from both countries asked questions about each other's environment, lifestyle and environmental practices. One of the points they explored was the landscapes in the two countries. Students discussed and compared the local landscapes they observed as they walked to school: England school students described walking past farms and across green hills, while the Maldivian school students described riding on a motorbike or taking a boat ferry to get to school. Maldivian students asked the England students if they were familiar with

mangroves – a body of inland water adjoining the sea and protecting the islands from the waves. The England students expressed their limited understanding of mangroves, and although mangroves are found in many islands in the Maldives there were students from Maldivian schools who also expressed their limited knowledge of mangroves. This discussion led to the idea that the Maldivian students would create a diorama of a mangrove and send pictures of it to the England students to show them how mangroves work. Figure 3 shows the mangrove diorama the Maldivian students made to share with their counterparts in England.



Figure 3: The mangrove diorama created by Maldivian students prompted by the discussion with England students.

The England students shared their sustainable practices around water use and environmentally friendly practices used in their schools. Their school gardens were used as an example. The Maldivian students found this concept of environmentally friendly practices interesting and expressed their keenness to create a school garden. The Maldivian school students shared some sustainable school practices such as the reusing textbooks from one grade to the other and bringing single-use plastics to school.

The interaction and the exchange of questions and responses between the two student groups as well as among the Maldivian students support the proposition of intercultural communication promoting cooperation and collaboration among students on concerning issues. The cross-cultural communications facilitated in the online meeting show that students who have knowledge of global and intercultural issues are able to understand the perspectives of others and demonstrate an interest in other cultures by translating such positive attributes into actions that benefit their local communities and the world in which they live (Milfont & Sibley, 2012; OECD, 2018). Evidence from the online meeting in this study showed that students were intrigued by the impact of nature on their well-being, demonstrating the important role of cross-cultural communication in enhancing students' learning of environmental and sustainability education along with developing values of global citizenship (Peng & Chen, 2023).

Teacher Professional Development and Learning Through Curriculum Innovation

The pre- and post-lesson discussions between the teachers and the researchers opened up opportunities for teachers to reflect on how they integrate empathy, global citizenship and sustainability into the curriculum. These reflections focussed on how such an integration can support teachers' pedagogical praxis, develop autonomy and enhance professional learning. According to a teacher from School 2, the process of reflecting that was supported by the project encouraged her to examine her teaching from previous lessons to explicitly encourage students to discuss ideas about sustainability and global citizenship. According to Mezirow (2003), the act of self-reflection and critical reflection enhances one's own practice and the discourse of reflection provides a strong foundation for pedagogical enhancement that supports transformative learning practices.

This teacher reflected,

"The way the students think, when they take these things, internalise the values and the lives of people, how they are living and all those things, are different actually from student to student. That is one of the things I realised. Because there were some kids who did not actually understand how these kids were living in conditions, how they were living and all that. They are not able to imagine how poor these kids can be, even if we explain that they are living on maybe one pound or one certain amount of money per day. So, they can't get this one perspective. It's not there. Because they actually, whenever they want, they get it. If you are not getting food one meal per day, when we say, they can't actually understand it. Certain kids can get it very well, but there are certain kids who do not understand it. So, I think from that one, I understood that these are the kind of things we need to teach our students". (Teacher from School 2).

This reflection demonstrates that when teachers explicitly focus on aspects of how different people live, students are keen to explore their lifestyles critically. Further, such discussions can lead to an understanding that promotes self-reflection about students' environmentally unfriendly behaviours. Such reflective thinking can change students' behaviour positively, towards pro-environmental actions, demonstrating how a direct focus on enabling students to discuss their behaviour and engaging in such meaningful discourse can facilitate pro-environmental thinking and behaviour (Stevenson et al., 2013). This reflection also provides a meaningful discourse for the teacher, enabling them to explore their current teaching practices and incorporate environmental issues in their future lessons. Such findings demonstrate how reflecting on innovations in teaching can provide powerful professional learning opportunities (Jones, 2021).

Further, the approaches to planning and implementation of these lessons demonstrate the ways teachers engaged in curriculum innovation and pedagogical enhancement. For instance, the three teachers from School 3 sat down to co-plan the project lessons with the research facilitator, allowing them guidance in ways in which lessons from this project can be implemented within the existing curriculum. The reflection and observation notes of these meetings taken by the research facilitator expressed how the teachers were able to move away from their initial hesitancy to identify ways in which they could integrate ideas of environmental and sustainability education in their lessons. Here is such an excerpt from one of the researchers:

"While communicating with the teachers regarding the lesson planning, the teachers identified the themes and topics that they were teaching, such as natural resources in the subjects science and social studies, and in the discussions the teachers needed a lot of guidance on how to incorporate and teach sustainable

use of natural resources. I observed initially that the teachers needed assistance on how to utilise critical thinking and problem-solving approaches to find solutions to the issue of freshwater sustainability and water shortages. However, following our discussions, the teacher has shown that they can implement such topics when guidance is provided and are able to utilise innovative pedagogy as well. Further, in the post-lesson discussion, the teacher expressed her excitement over the lesson and how she wanted to be more active in protecting the environment. I think this is powerful professional learning for the teachers.” (Researcher notes 2)

These findings demonstrate the importance of providing teachers support in curriculum innovation and how powerful that support can be to their professional development and learning (Shiyama, 2020). Further, the findings also demonstrate the challenges to curriculum innovation for teachers who are used to strong prescriptive curriculum implementation. For teachers with such habits, decisions to move towards flexible curriculum approaches are difficult and require time and support from both the school and their peers (Sukma et al., 2020). In addition, the process of curriculum innovation through peer collaborations can provide strong professional learning experiences, as demonstrated in this study. Biesta (2022) argues that such opportunities also provide teachers themselves with ideas for environmental activism. Such opportunities in turn motivate teachers towards self-learning and improvement in their pedagogical practices (Sureda-Negre et al., 2014).

Limitations

This paper reports on part of the findings from this project and highlights the data from the Maldives only. It is important to highlight that the data collection time frame limited the amount and the nature of the data that was collected. Additionally, the input from the teachers at all stages of the project was limited when compare with what was anticipated, owing to school workload and various other commitments.

Conclusion

This study explored how students express their understanding and perspectives of local environmental issues, their aspirations for their future spaces and their active roles as global citizens through art and other forms of texts. Further, this study also examined how teachers practise curriculum innovations for environmental and sustainability education and the associated pedagogical enhancement and professional learning experiences.

Overall, this study highlights the opportunities for curriculum innovation despite teacher hesitancy to move away from the one-size-fits-all approaches in curriculum implementation. This study has shown that one way such curriculum innovation can be brought about is by the thematic integration of environmental and sustainability education, together with global citizenship values, in the existing curriculum. In particular, the findings of this study indicate that when teachers are supported by peers and collegial co-planning, teachers are willing to integrate the subjects into more meaningful lessons that stand to provide powerful learning experiences for their students. Further, this study has also shown that when teachers are given the time and support for curriculum innovations, their professional development and learning are powerful and more meaningful.

This study has also shown that when students are provided with local examples and opportunities to discuss environmental issues of concern, students' critical discourse about environmental and sustainable practices is activated. Further, this study has shown that such activities when facilitated by cross cultural-

communication and dialogue can have a stronger and meaningful impact on students' worldviews. In addition, this study has demonstrated that cross-cultural communication can be facilitated by digital learning spaces that can bring students and teachers together, across different cultures and time zones. These findings highlight how cross-cultural communications can enable the students to capitalise on their culturally situated knowledge, ideas and concerns about the environment. Furthermore, this study has shown that students are more motivated and keener to learn when a place-based education approach is used, in which themes are based on their local environment and used as entry points for classroom discussions. This study also demonstrates the criticality of using art-based pedagogical approaches in environmental and sustainability education. The study has shown that the arts are important for cross-cultural communication and as a means of self-expression and that the arts have a vital role in teaching young people about personal interpretation and how voicing views and opinions through different media can have a powerful impact. Further, such pedagogical approaches stand to expand students' horizons of other cultures beyond their textbooks and assist students in developing empathy for others, thereby inculcating values of global citizenship.

In conclusion, these findings can be used in designing powerful teacher professional learning opportunities and approaches centred around environmental and sustainability education practices. These pedagogies and their focus on art-based education, cross-cultural communication and place-based-education are powerful tools and teaching strategies that promote students' understanding of sustainability and environmental education. In doing so, the findings of this study seamlessly contribute to the Government of Maldives' Policy 2 (2019) aim to reduce the learning gap and ensure improved and equitable learning and skills development, for all students through effective curricula implementation and learning assessments, as well as contributing to implementation of the SAP of the Maldives. As such, these practices and pedagogical approaches can be integrated into the formal curriculum to make the curriculum more meaningful for teachers and students alike. The long-term impact of such pedagogical and curriculum innovations could be examined as an extension of this research.

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