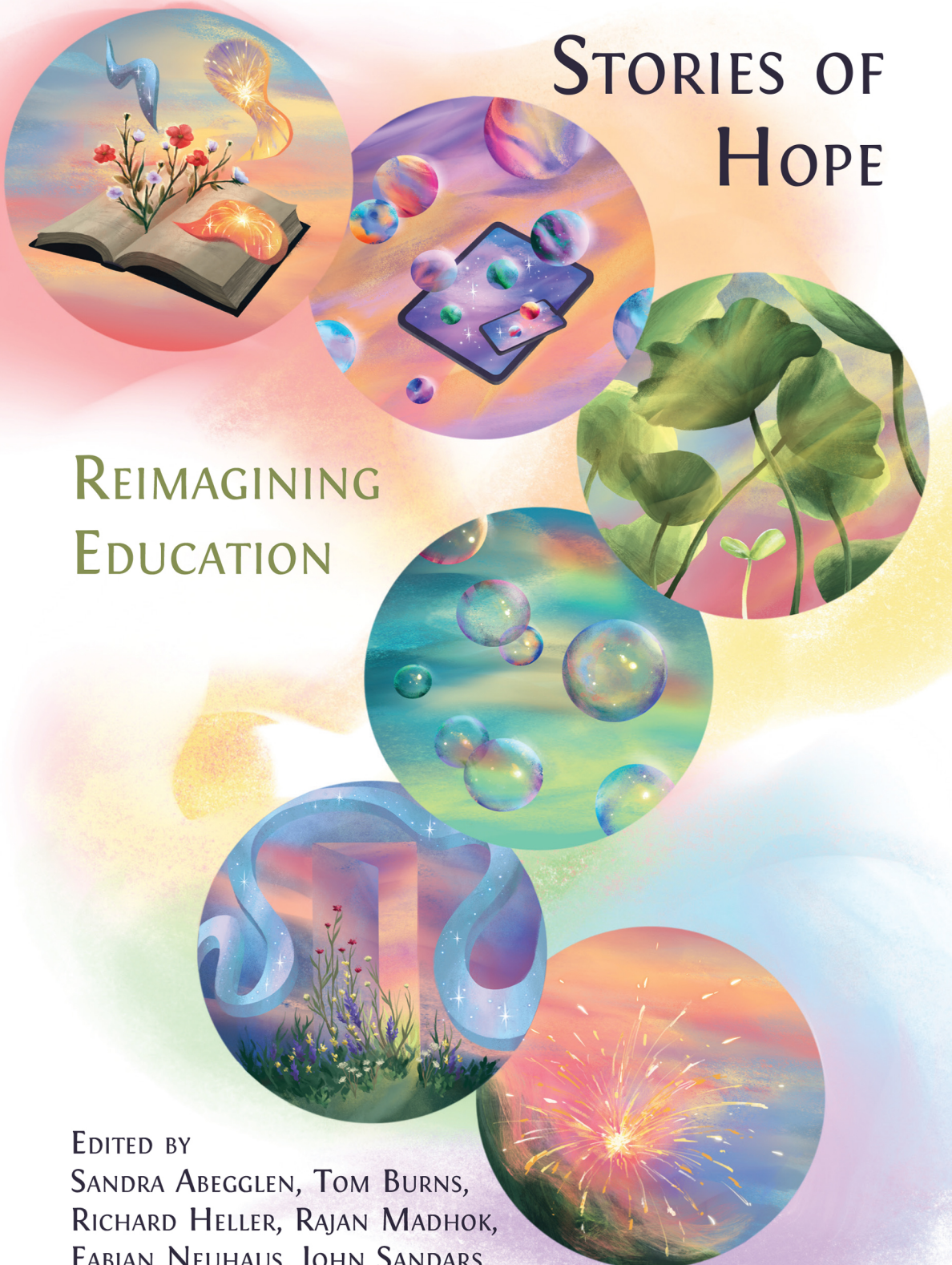
Stories of Hope

Reimagining Education



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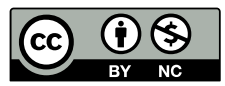

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9. The emotional impact of nature seen through the lenses of virtual reality (VR) and revealed through the power of expressive art

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Abstract

This chapter explores the integration of Virtual Reality (VR) technology, expressive art, and nature exploration to enrich educational experiences and enhance education. The VR-ART project aimed to foster a deeper connection to nature by using VR to evoke emotions and visual art to facilitate the exploration and expression of those feelings. The project's outcomes were transformed into pedagogical artifacts for Pre-Service Teachers (PSTs), offering practical examples and opportunities for reflective practice. These resources serve as exemplars of innovative teaching approaches, highlighting the potential of combining technology, art, and nature to create meaningful learning experiences and foster hope.

Keywords: virtual reality; education; expressive art; emotions; nature; teachers

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Introduction

In the rapidly evolving landscape of education, innovative technologies have the potential to revolutionise students' learning experience and change the outlook on education. This chapter discusses the potential benefits of Virtual Reality (VR) in eco-centric education, the challenges associated with its implementation, and the role of expressive art as a medium for reconnection with reality through the expression of one's own emotions. Ultimately, the aim is to inspire a deeper connection to nature and foster a more empathetic and environmentally conscious generation of learners that can move forward with hope.

VR in education

VR is an immersive, multisensory, three-dimensional (3-D) experience (Gigante, 1993) created with software that replicates the real world (Sherman & Craig, 2019). Within the context of education, emerging evidence has demonstrated that VR-supported lessons can enhance positive emotions and engagement when compared to more traditional tools, such as reading from textbooks (Allcoat & von Mühlenen, 2018).

According to Riva et al. (2019), VR could support our brain in generating embodied simulations. It is known that our brain can create mental images of 3-D objects, and by interacting with and rotating these objects, they become visually and motorically embodied in our minds, stimulating cognitive processes and learning (Jang et al., 2010). With the advancement of new technologies, VR programs for education now enable users to interact directly in a 3-D environment, triggering embodiment and cognitive processes through situated learning (Schott & Marshall, 2018; Hamilton et al., 2021), experiential learning (Jantjies et al., 2018), and various other pedagogical experiences beyond time and classroom constraints.

However, it is necessary to consider that technology-mediated teaching and learning, such as VR-supported lessons, could pose real risks to an individual's physical, cognitive, and psychosocial development. Careful consideration of health and safety, along with limited usage time, is crucial, especially in young adults (Nichols, & Patel, 2002). Further barriers to reaping VR benefits in a learning environment

could be linked to educators' self-efficacy and confidence (Cooper et al., 2019). Implementing VR-supported lessons and providing student teachers specifically Pre-Service Teachers (PSTs), with opportunities for reflection could be particularly effective in enhancing PSTs' self-confidence (Rodolico & Ding, 2021) and capacity for experimentation and change.

The emotional impact of nature

It is well known that contact with nature can be beneficial to mood, overall health, and even to executive cognitive tasks that demand directed attention processes (Stenfors et al., 2019). Connection to nature, empathy, and cognitive processes could be particularly important for student teachers, not only for their learning experience but also for their teaching careers (Zeyer & Dillon, 2019). By linking empathy with eco-centric values, education could become a potential vehicle for transformation towards a society based on ecological principles (Lithoxoidou et al., 2017)—a hopeful education. Initial Teacher Education (ITE) could play a significant role in supporting the successful practice of Education for Sustainable Development in schools by fostering a connection to nature in their courses (Anđić & Šuperina, 2021).

Virtual reality and the connection to nature

While outdoor learning is widely studied as an effective pedagogy for developing contact with nature (Pirchio et al., 2021), there are times when travel restrictions, such as financial barriers and, more recently, the COVID-19 pandemic, could make it difficult or even impossible for some learners to experience a wide range of different environments. This could affect not only their connectedness to nature but also the way they react to a crisis such as a pandemic (Haasova et al., 2020). In a classroom setting where walls represent a barrier, VR could serve as a medium to promote situated experiential eco-centric education (Schott & Marshall, 2018), increasing opportunities for "out of the classroom" learning. VR could support experiential and emotional aspects, impacting two out of the five elements required to reconnect with nature: material, experiential, cognitive, emotional, and philosophical. It acts as a

bridge between internal and external factors, pushing forward the idea that reconnecting people with nature can function as a treatment for the global environmental crisis (Ives et al., 2018). Ultimately, when the Intended Learning Outcomes are based on a reconnection with nature, it is also necessary to reconnect with reality and the inner self. Art-based methods have shown great potential in unveiling nuances of human–nature connectedness that go beyond words due to their capability of tapping into emotions and embodied experiences (Muhr, 2020), allowing for a profound understanding, and learning through embodied cognition.

Expressive art as a medium for emotional expression

Expressive art, particularly visual art, offers a powerful medium for individuals to analyse and express their emotions (Dubal et al., 2014). When combined with VR experiences of nature, expressive art can help individuals explore and convey their emotional responses to the natural world. Through various art forms, individuals can tap into their emotions and embodied experiences, fostering a deeper understanding of themselves and the environment.

Visual art as responsive narrative

The use of visual coding as a narrative is a powerful, often cathartic means of conveying an intrinsic non-verbal emotional response to extrinsic stimuli. We interact emotionally and psychologically with the "visual frequencies" or "elements"—essentially, the colours, lines, angles, patterns, forms, shapes, textures, and spaces that collectively comprise our natural and built environment, the world. We may respond in various ways—consciously and subconsciously—to different permutations of visual elements; their aesthetic/emotional impact may differ based on our knowledge and experiences in our lives or first-time experiences (Eisner, 1997). Artmaking becomes a fundamental form of symbolic analysis, problem-solving, communication and expression, and means of connectedness - the cultivation of "multiple ways of seeing, and multiple dialogues in a world where nothing stays the same" (Greene, 1995, p. 16). When we create a drawing or compose a painting

in response to a given point of reference, whether internal or external to oneself, the positioning of the "self" in a composition can offer insights into one's sense of identity and perceived agency within their personal environment and the wider world (Hadiprawiro, 2019).

In-Service Teachers' practical experience

To explore the integration of VR, expressive art, and nature exploration in education, a case study was conducted with In-Service Teachers (IST). The study consisted of two phases: a pilot stage and an intervention in schools.

During the pilot stage, participants were asked to work in pairs:

1. Exploratory phase: During the initial phase of the project, participants were afforded the opportunity to familiarise themselves with immersive VR through supported tours focusing on natural landscapes, enabling them to immerse themselves in lifelike environments and VR exploration of nature. They were asked to use ClassVR headsets to explore ten VR scenarios, ranging from under the sea, to a forest setting and more. The first 10 minutes were needed to familiarise themselves with the equipment and to go through the safety rules. Then they undertook 20 minutes of VR exploration with regular breaks (every 5 minutes for children from 5 to 12 years old and 7–10 minutes for 13 years old and above)
2. Emotion Expression: Expression of emotion through art-based medium. Participants were provided with painting, colours, crayons and other art-based equipment including seeded paper and recycled paper. IST educators were paired together. Within each pair, one participant would immerse themselves in a nature-focused VR experience. Subsequently, employing the strategies and insights previously discussed, they would articulate and describe the emotional landscape elicited by the virtual environment to their partner. In response, their partner would translate these emotional impressions into a visual representation, reflecting their personal interpretation of the feelings conveyed (Fig. 9.1a and 9.1b).

Fig. 9.1a Left, VR scenario obtained via ClassVR, www.classvr.com). Right, teachers expressing and drawing each other's emotion (Mrs Anne McColloch (headset), Miss Ciara Kinsella (painting)).

Fig. 9.1b Teachers expressing and drawing each other's emotion (photo by authors).

3. This dynamic was then reciprocated, with the roles being swapped between the educators. An example of the artwork is shown and explained in Fig. 9.2.

The emotions felt in VR expressed by these educators were subsequently documented in their feedback. Examples of such feedback were: "I didn't' know how tall the trees could be"; "I feel the cold"; "the fire was scary", and "it makes one wish to go there". Notably, these educators centred their descriptions not on the objective aspects of the virtual environments they explored, but rather on the emotional responses

evoked by those environments.

4.

Fig. 9.2 Artwork by an In-Service Teacher (Mrs Pauline Egan).

environments they explored, but rather on the emotional responses evoked by those environments.

Following this pilot experiential phase, IST participants were provided with the opportunity to engage in dialogues with accomplished artists, such as Pieter van der Houwen. This interaction was intended to further enhance their competence in employing expressive arts methodologies. This reflective stage was substantially enriched by the exchange of insights and techniques encompassing expressive art strategies (as contributed by the artists) and pedagogical approaches (as shared by the educators). This collaborative exploration empowered the participants to harness the potential of expressive arts to deconstruct and articulate their emotional experiences. Pieter van der Houwen has worked on several projects involving participatory photography and he led this step of the workshop, captivating the teachers with his descriptions.

Peter's comments:

> Participatory photography offers a unique opportunity to investigate and document communities and social environments. The subject basically becomes the photographer. This dual role provides a very personal and intimate approach which is able to create a link between the pupils (photographers) and the topics focus of this workshop. In return this can enhance their understanding creating a unique connection between learning and personal life.
>
> It has often been used as a pedagogical tool creating a more in-depth understanding of one's own surroundings.
>
> It can be influential in the processing of trauma and coming to terms with loss. This is beyond doubt; however, what is very interesting is that through participatory photography we, as the viewers, gain access to relatively unknown environments and a deep level of evaluation of impact that goes beyond simple words.
>
> Participatory photography could also be referred to as civilian journalism. The professional photographer is no longer our proxy documenting the world we occupy but an "amateur" picturing their understanding of the world. This has also produced a strong new visual vernacular, one that is no longer determined by technical capability but relies much more on immediate intimacy.

In summary, the pilot stage of the project facilitated the engagement of IST with VR-enhanced natural landscapes, prompting them to delve into their emotional responses. In the final stage, IST were provided with VR and art-based equipment with the aim of embedding this authentic experience in their own classrooms.

Teachers' feedback

Teacher 1: "I was very surprised at how tricky it actually is to connect with your emotions and get out of a rigid and concrete way of thinking—this was quite enlightening!"

Teacher 2: "Allowing each teacher to genuinely explore the emotions evoked by the use of VR, and respond in a completely unconstrained way, ensured that the course was deeply meaningful to each individual."

Teacher 3: "For many pupils, their experience of nature is limited. VR use certainly opens a new channel through which 'nature' can be made real to them. On a more advanced level, VR makes real to children the places that otherwise they would be very unlikely to visit. Personally,

experiencing VR stirred up emotions that inspired me to engage with the suggestion of responding through expressive art."

A study by Kalvaitis and Monhardt (2012) explores the relationship between children and nature, and how art can be used to convey and explore this relationship. Children between the ages of 6–11 were asked to draw from their imagination, portraying themselves in an outdoor environment and then creating art to express their experience. The study found that all of the children demonstrated a positive relationship with, attitude to, and concern for, the natural world. While this approach is effective in conveying children's relationships with nature, it is important to note that it is the child's own reality that can be altered at will.

In contrast, when it comes to immersive VR, the point of reference is not intrinsic to the child and is a perpetually changing environment that cannot be stilled for sustained close observation. This raises ethical concerns about exposing young people to potentially traumatic sensory experiences.

However, if one considers John Dewey's view of the child as an organism living in and interacting with the environment (Dewey, 1925) encountering challenging environmental conditions is necessary in order for intelligent action to go forward and through which the problematic situation could be resolved (Eisner, 1997). Thus, they become truly wide awake and connected.

Creating pedagogical artifacts for Pre-Service Teachers

The project's outcomes, including reflections, artworks, and pedagogical artifacts, were used to generate resources that have been embedded in the ITE courses to enhance the learning experience of PSTs in primary and secondary education. By observing and engaging with the learning experiences of In-Service Teachers, PSTs could develop their understanding of environmental issues, emotional engagement, and expression.

Resource 1: Digital storytelling artifact (https://figshare.com/s/9caab7bcb2000c9344ac)

Resource 2: A virtual tour with the project's outcomes (https://doi.org/10.25416/NTR.16689208.v3)

Conclusions and recommendations

To bring this vision to life, teacher education institutions can take gradual and reflective steps to incorporate VR and expressive arts into their pedagogical practices. This includes exploring suitable VR tools, designing art-based activities that support emotional expression, engaging in relevant professional development, and fostering spaces for reflective dialogue. Crucially, effective collaboration among educators, researchers, and technology developers is essential to overcoming implementation challenges and ensuring the pedagogical integrity of these innovations.

Over the course of this study, the use of VR-generated immersive learning promoted a wide range of participant responses, communicated through artmaking as both a narrative and a medium of verbal and non-verbal dialogue. By blending immersive technologies with creative and environmental exploration, participants engaged with nature-based scenarios in ways not possible within the limitations of a conventional classroom. Instead of being passive observers, reading about deforestation or watching a documentary, they became emotionally and sensorily immersed, enabling them to offer more informed critical perspectives on environmental issues.

Artmaking in this context goes beyond representation. It becomes a multisensory, emotionally driven process where students express what cannot be captured through conventional dialogue alone. Rather than simply painting an image of the rainforest, they render how it feels to stand within it from experiencing and observing it in VR to embody emotional and ecological awareness using colour, line, and forms. This shift from observing and experiencing to embodying and feeling helps students to develop emotional and ethical awareness which in return could enable them to engage not only intellectually, but empathically and responsibly with the issues they encounter (Greene, 1995). In conclusion, the thoughtful integration of VR, expressive arts, and ecological themes in teacher education can provide opportunities to create emotionally resonant learning experiences. These experiences not only could potentially cultivate empathy and environmental consciousness but also empower students as critical thinkers and future agents of change. Future research might explore how such practices can be scaled, adapted across cultural contexts, and embedded within teacher training frameworks to support sustainable educational reform.

Steps toward hope

- Leverage VR technology to create immersive educational experiences that foster emotional connections to nature and enhance learning, integrating these experiences into educational practices.
- Encourage the explicit expression of emotions through visual art as a complementary tool to deepen connections with nature in educational contexts and develop and share pedagogical artifacts for further discussion and celebration.
- Provide PSTs with exemplars and opportunities for reflection and discussion of practice that demonstrate the integration of VR, art, and nature exploration in meaningful and reflective ways.

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