Overcoming Barriers to Outdoor Science Education in Ireland

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Abstract

Outdoor education (OE) is purported to have several emotional, physical and academic benefits for students. The junior cycle science curriculum lends itself very well to OE, yet it seems to be an underutilised and under researched facet of education in Ireland. Inspired by a love of the outdoors and first-hand experience of witnessing the lack of awareness within schools of the potential benefits of outdoor education, this integrative literature review (ILR) sought to explore the perceived barriers to OE and identify how Irish science teachers can navigate these barriers effectively. The review carefully selected twelve papers which looked at outdoor education in secondary schools from varying perspectives and through thematic analysis identified three themes; the benefits of OE, the perceived barriers to OE and methods of overcoming these barriers. The findings demonstrate how with planning and support, OE can be employed by teachers delivering the Irish junior certificate science curriculum. The overall themes are discussed in light of the wider literature and with reference to the Irish context.

Introduction and Background

This dissertation topic developed from the researcher's appreciation of the environment and the beliefs that everyone should have a certain degree of knowledge about their environment. Also, that by providing an educational experience outside of the classroom and outside of what is normal for students, allows for an improvement in retention.

Due to the covid-19 pandemic the Department of Education and Skills (DES) has encouraged post primary schools to 'consider accessing available spaces in the local community if practicable' (DES, 2020, p.5). This has led schools to explore the use of outside classrooms and where practical, make use of other outdoor spaces in order to ensure adequate physical distancing while learning. Some teachers have conveyed a hesitancy to engage in outdoor learning amid 'concerns about children losing concentration, along with the notion that the outdoors could not provide appropriate reinforcement or consolidation of previous learning' (Hawxwell, 2019, p.111). This perception would go against the evidence which suggests that outdoor learning results in a 'superior working memory and greater reduction in inattentiveness' (Dadvand et al, 2015, p.7939).

A recent study surveyed teachers to ascertain what they perceived as the main barriers to (OE). The most common barriers identified included the fact that OE had 'no formal status in teachers' educational practice (46.3%), followed by a lack of teacher confidence in their own outdoor teaching expertise' (Van Dijk-Wesselius, 2020, p.6).

Science as a subject lends itself to outdoor learning more than most subjects taught in Irish secondary schools, especially the ecology component. However, the extensive curriculum does constrain teachers somewhat, who may feel they would achieve more in less time by remaining indoors. When surveyed, 20.5% of secondary school teachers 'declared that lack of time for outdoor teaching was an obstacle to environmental education' (Hyseni Spahiu et al, 2014, p.2758).

By initially identifying the barriers that obstruct teachers from teaching outdoors and the recognised advantages of outdoor learning, the main aim of this dissertation can be addressed, which is to explore how we can effectively incorporate an outdoor environment into the teaching of the Irish science curriculum.

Methodology

This research project involved the assemblage and analysis of relevant literature.

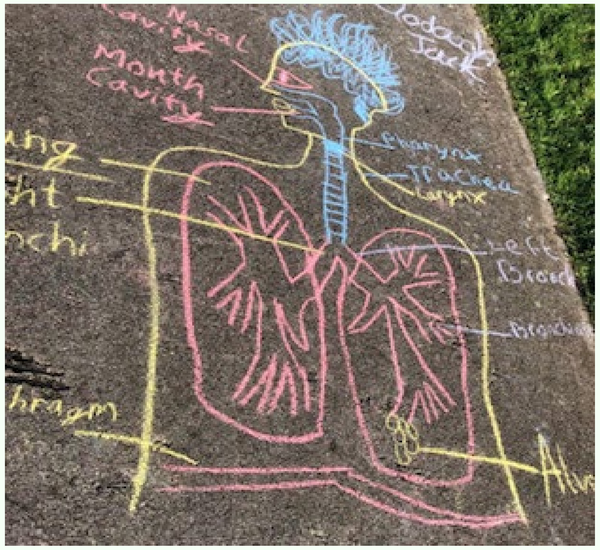
Following a preliminary literature review, Taylor & Francis and three other databases within EBSCOhost were used to search for relevant material.

A number of search terms pertaining to the topic were applied using Boolean logic and only articles published within the last 10 years were considered.

Forty-one abstracts were read, followed by twenty full articles. Eight articles were further excluded following more thorough assessment, which left the final selection of twelve articles.

Database / Source	Records Screened	Abstracts Read	Articles Read / Evaluated	Articles Included
Education Source	131	29	9	4
Academic Search Complete	32	6	5	3
ERIC	1	1	1	1
Taylor & Francis	58	5	5	4
Total	222	41	20	12

The articles were summarised and critiqued where the approach taken, methodology used and limitations were noted. This was then followed by a detailed thematic analysis based on Brun and Clarkes (2006) model.



Findings and Discussion

This ILR aimed to explore how outdoor learning can be effectively incorporated into the teaching of the Irish science curriculum. The selected studies were dissected to initially identify the perceptions, teachers and students have towards outdoor learning. The process uncovered three distinct themes which ran through all of the selected articles; the wide-ranging benefits of outdoor learning for students, the perceived barriers towards outdoor education and the steps than can be taken by teachers and schools to eliminate or minimise these perceived obstacles to outdoor education. While the studies selected pertain to the perceptions, barriers and importance of outdoor education internationally, the information can also be applied to an Irish context.

Benefits of outdoor education

- Outdoor school work more enjoyable, which in turn affected students' interest and motivation.
- There are positive correlations between standardised testing scores and/or classroom performance and the use of outdoor classrooms.
- Amos & Reiss (2012) acknowledged the 'personal, socio-cultural and physical benefits associated with informal learning' (Amos & Reis, 2012, p.487).
- Fagerstam (2014) noticed improvements in students' collaboration, communication skills, self-esteem and empathy towards other students.

Barriers to outdoor education

- School-based outdoor teaching is very time consuming.
- Sections of the Irish science curriculum, such as chemistry and physics, are not so conducive to the outdoors.
- For science teachers who do not have a personal interest in the outdoors, there are no CPD opportunities to train the teachers to the required level.
- Some authors reported bad behaviour or at least the fear of bad behaviour amongst teachers.
- Adverse weather conditions and student's inadequate clothing.

Steps to minimise barriers

- Develop a good rapport with the students.
- Make outdoor lessons resemble ordinary school activity to allow students accept it as part of normal school practice.
- Accept the uncertainty brought by being out of ones comfort zone as a significant learning opportunity.
- Adequate planning and preparation minimises the effect of climate on OE.
- A supportive institutional structure in the school.
- Teacher CPD training concentrating on areas where teachers' expertise can readily be developed in outdoor learning including supporting curriculum delivery through science.
- Locate a suitable site near the school, such as in the playground, a nearby park, forest, river or pond.

The mere act of being outside of a classroom, regardless of the environment can be enough to stimulate students and encourage them to use skills such as teamwork, which they would not ordinarily use in a classroom.

Conclusion

The papers in this review identify a commonality in terms of perceived barriers to OE amongst educators around the world

One of the most significant barriers as seen by those teachers who did not have a particularly strong affection for the outdoors, was the lack of suitable teacher training, which resulted in teachers not having the confidence to link the curriculum to outdoor activities.

The papers in this review also suggest that if teachers feel underprepared then their fear of losing control is also heightened.

For those who did practice OE, unfavourable 'weather and students inadequate clothing prevented teachers from going outdoors as much as they would have liked' (Kervinen, Uitto & Juuti, 2018, p.121). However, the same authors suggested that all barriers could be overcome by establishing a supportive structure within the schools.

OE is in its infancy in Ireland and Irish teachers are at the stage where they would initially just like the 'support of grassroots teacher-led movements' (Waite, 2020, p.21).

When OE is persevered with, the findings amongst the articles suggest that OE 'has a positive effect on student participation and social behaviour, which has major educational potential' (Fagerstam, 2014, p.75). An initial period of familiarisation is also essential to allow students time to come to the realisation that OE should be treated with the same level of respect and attention as indoor education.

Limitations

The constraints of a rigorous documentary research limited the articles that could be selected to those that were within the parameters of predefined search criteria including; specific databases, peer reviewed journals and ten-year time frame.

While the research question pertains specifically to Irish science teachers and OE, there is a considerable lack of empirical research within the Irish context. Therefore, research from around the world was analysed and the data extrapolated was applied to the Irish educational system.

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