

The key issue

Substantial evidence exists to indicate that outdoor science education (OSE)—properly conceived, adequately planned, well taught, and effectively followed up—offers learners opportunities to develop their knowledge and skills in ways that add value to their everyday experiences in the classroom. Specifically, OSE can have a positive impact on long-term memory due to the memorable nature of the setting. Effective OSE, and residential experience in particular, can lead to individual growth and improvements in students' social skills. More importantly, there can be reinforcement between the affective and the cognitive, with each influencing the other and providing a bridge to higher-order learning. However, despite the substantial evidence of the potential of OSE to raise standards of attainment and improve attitudes toward the environment, there is evidence that the amount of OSE that takes place in the U.S. and in some other parts of the world is severely restricted.

The current state of knowledge and practice

Much of the research and writing on learning in informal settings focuses on what happens inside rather than outside. Although some of what we know about learning in informal settings is generalisable across contexts, there are aspects of learning out-of-doors that can *only* happen outside. **Strong evidence of the benefits of outdoor adventure education is provided by two meta-analyses of previous research** (Cason and Gillis, 1994; Hattie *et al.*, 1997). Looking across a wide range of outcome measures, these studies identify not only positive effects in the short term, but also continued gains in the long term. However, within these broad trends, there can be considerable variation between different kinds of programmes, and different types of outcomes.

There is substantial research evidence to suggest that **outdoor adventure programmes can impact positively on young people's:**

- **attitudes, beliefs, and self-perceptions:** examples of outcomes include independence, confidence, self-esteem, locus of control, self-efficacy, personal effectiveness, and coping strategies
- **interpersonal and social skills:** such as social effectiveness, communication skills, group cohesion, and teamwork.

The evidence base for cognitive and physical/behavioural benefits is less strong than for affective and interpersonal/social outcomes. However, in cases where there is a focus on such measures (for example, the work of Dowd and Dillon—both at King's—who researched the impact of an outdoor education award scheme in England), there are examples of outdoor adventure programmes yielding benefits in:

- the development of general and specific academic skills, as well as improved engagement and achievement, and,
- the promotion of positive behaviour and reduced rates of re-offending, and improved physical self-image and fitness.

In relation to fostering environmental concern and awareness, **the evidence of a positive link between outdoor adventure activities and environmental understanding and values is not strong.** There seems to be a strong case for questioning the notion that nature experience automatically contributes to environmental awareness, commitment, and action.

In considering the literature on learning outdoors, it is helpful to distinguish between:

- factors that can influence the provision of outdoor learning by schools, teachers, and others; and,
- factors that can influence the nature and quality of young people's learning in outdoor settings.

It is clear that **the provision of outdoor learning in schools and universities is affected by a wide range of barriers and opportunities**. Notable barriers include:

- fear and concern about health and safety
- teachers' lack of confidence in teaching outdoors
- school and university curriculum requirements limiting opportunities for outdoor learning
- shortages of time, resources, and support, and
- wider changes within and beyond the education sector.

Opportunities for outdoor learning provision, though, are also noted in the form of (1) new legislation and regulations, such as those relating to safety at outdoor activity centres, and (2) recent curriculum developments and initiatives. These various factors make clear the complexity of the challenge facing policy makers, practitioners, and others who are seeking to increase and improve young people's access to learning beyond the classroom and the school. Some of the complexity is being researched by Brandt (UCSC) and Hammond (Cal State Sacramento), who are examining the sociocultural relevance of outdoor activities carried out to meet new curricula.

The research that has been undertaken into students' experiences of outdoor learning activities suggests that **there are several factors that can facilitate and/or impede learning in outdoor settings**. These can be conceptualised in terms of:

- **programme factors** including the structure, duration, and pedagogy of outdoor education programmes;
- **participant factors** including the characteristics, interests, and preferences of learners, and,
- **place factors** relating to the nature and novelty of the outdoor learning setting.

Taken together, these factors provide a framework for thinking about how efforts to improve the quality and depth of young people's outdoor learning might be directed.

Recent CILS research has identified other salient issues that have implications for practitioners with respect to access of learning opportunities in outdoor education. In an ethnographic study of middle school Latinas in a marine science camp at a summer camp held at a major aquarium, Brandt and Wheaton (both UCSC) identified an emphasis on girls to maintain a 'mothering' or _caregiving role during outdoor activities. This role was reinforced by the camp staff, and the caregiving role dominated other "identities" offered to the participants and interns.

An agenda for research and practice

Social justice issues

The current evidence base is not without weaknesses or potential areas for improvement. The number of studies that address the experience of particular groups (for example, girls) or students with specific needs is negligible, although those that have been done draw conclusions that are important in terms of both policy and practice. Some children are more likely to take part in OSE than others for a range of reasons, many of which could and should be addressed. **There is a need to research which factors affect why certain groups have greater access to OSE than others**, and the roles that are open to participants engaging in OSE.

Factors affecting the impact of outdoor science education

There is a need for further research into: the extent of outdoor learning provision available to schools; the effectiveness of outdoor learning programmes that seek to build progression from local environments to more distant learning contexts; the sorts of fears and concerns that young people can bring to different kinds of learning situations beyond the classroom; teachers' and outdoor educators' conceptions of 'the outdoor classroom'; and the cost-effectiveness of different kinds of outdoor learning. There is a need for practitioners to look for ways to bridge home, school, and community, and to provide the necessary context for abstract science concepts taught in schools. There is

also a need for practitioners to see outdoor education as offering locations in which students can self-identify with aspects of science in ways that are not possible in school.

Improving the quality and depth of research

In order for these gaps to be addressed, attention will need to be given to **two important issues**. The first is **how to improve the methodological rigour of outdoor learning research and evaluation**. The literature too often displays a range of methodological weaknesses, including poor conceptualisation and research design, and little or no follow-up in the medium to long term. The second issue is **how to improve and deepen the research-based understandings of the outdoor learning process**. To put it simply, there is still much to be learnt about how and why programmes work or don't work.

Developing the theory base

Finally, there is a case to be made for greater theoretical and empirical attention being given to three significant 'blind spots' in the current literature. These concern: **(1) the nature of the 'learning' in outdoor education; (2) the relationship between indoor learning and outdoor learning; and (3) the historical and political aspects of outdoor education policy and curricula.**

Note

This paper is derived from the executive summary of a review of research on outdoor learning carried out in 2004 (Rickinson *et al.*, 2004).

References

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