NATURAL HISTORY MUSEUM

Sustainability

a public engagement literature review

Executive summary

This paper explores what people know and understand about sustainability and their attitudes to it. It examines some of the issues raised in the learning research literature, and highlights implications and recommendations for our practice in engaging NHM audiences in learning about sustainability.

There are several key points emerging.

- The term 'sustainable development' is not used freely by young people, or well understood. Sustainability is commonly taken to mean 'keeping things going as they are'.
- Young people do seem to have a good understanding of the term 'sustainable practices', however, eg in the context of supermarket packaging and locally sourced produce.
- Sustainability, along with other environmental issues, is not a main concern of people when asked to rank a range of social issues.
- Many people are misinformed about environmental problems and do not perceive them to be as important as many experts argue they are.

We should consider the following in our public engagement practice:

- challenging learners to explore their own values by looking at social, economic and environmental dimensions to any sustainability issue
- using current/topical real-world sustainability issues provides interest, motivation and relevance for learners
- multiple voices expressing different viewpoints are essential for effective exploration of sustainability issues
- experiential, active learning approaches improve thinking skills and cognitive understanding of sustainability
- the best sustainability education requires learners to take part in activities that contribute towards sustainability.

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Introduction

The purpose of this paper is to inform Natural History Museum (NHM) colleagues about research on the public's awareness, knowledge and understanding of, and their attitudes towards, sustainability and successful ways of engaging the public with the subject. This is a living document that will be updated frequently.

Sustainability is one of the three core Museum narratives alongside evolution and biodiversity. These narratives underpin and inform both NHM science and public engagement activity.

The NHM has a position statement in the strategy to 2020 that outlines a role for the Museum with regard to sustainable futures:

"Our planet is entering a period of rapid environmental change. Such changes threaten the stability of the natural systems on which human well-being depends as well as the supply of resources that underpin global economies. Working with other organisations, we study the effects of biodiversity loss, pollution, mineral extraction and spread of diseases and provide the expert knowledge on which to build innovative solutions to these challenges. At the same time, our public profile as a voice of authority on the natural world allows us to engage the public in the debate on sustainable approaches to how we use our natural resources."

Natural History Museum, 2015

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Definitions

- **Sustainability:** the interaction of social, economic and environmental conditions. An activity, process, project or region is deemed sustainable if harmony between these three dimensions can be maintained over the long term (Herremans and Reid, 2002).
- **Sustainable development (SD):** is usually defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Corney, 2006).

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Knowledge and attitudes towards sustainability

The key points emerging from the research are:

- The term 'sustainable development' is not used freely by young people, or well understood. Sustainability is commonly taken to mean 'keeping things going as they are.'
- Young people do seem to have a good understanding of the term 'sustainable practices', however, eg in the context of supermarket packaging and locally sourced produce.
- Sustainability, along with other environmental issues, is not a main concern of people when asked to rank a range of social issues.
- Many people are misinformed about environmental problems and do not perceive them to be as important as many experts argue they are.

Vasi (2012) reports that 'results from international and national surveys suggest that public sentiment towards sustainable development is somewhat inconsistent. On the one hand, the public's support for sustainable development is "a mile wide" since a large majority say they are concerned about environmental problems. On the other hand, the public's support is often "an inch deep" since many people are misinformed about environmental problems and do not perceive them to be as important as many experts argue they are.' Vasi attributes these findings to two main factors, a lack of accessible information about environmental issues and widespread misinformation.

Renton et al (2011) found that the term 'sustainable development' was not used freely by young people, but that they had a good understanding of sustainable practices, for example in the context of supermarket packaging and locally sourced produce. They concluded that 'environment and environmental problems are important themes for children and young people.' Similarly, the majority of 7- to 11-year-old girl guides in the study Girlguiding UK (2010) showed some concern for environmental issues. By far the biggest concern for girls of this age was humanitarian, and they were least concerned by the sustainability issue of 'oil and gas becoming too expensive in this country, so people won't be able to drive cars and use central heating'.

A report produced for the World Wildlife Fund by Gayford (2009) found in one study that young people 'expressed particular concern for biodiversity when considering issues of sustainability and saw rainforests as important habitats for animals, particularly the more exotic species.' They also found that 'most pupils, including some of the youngest (in Year 4), had heard of the word "sustainability" as applied to the environment. Perhaps not surprisingly though, relatively few could give a satisfactory explanation. If they were able to suggest a personal concept of sustainability, most would say "to keep things going as they are".'

A study from Northern Ireland by Rogerson (2009) found that when adults are asked to rank different issues, 'highest importance is assigned to economic issues; crime and violence; employment; education; health, family and relationship issues. Issues such as sustainability, climate change, and the environment are assigned lower importance.'

Recent surveys of UK residents (aged 16–64 years) on environmental issues by Ipsos MORI (2012, 2014) found that:

- people rate 'future energy resources', 'waste' and 'overpopulation' as the top environmental priorities
- 83 per cent of people believe that extreme weather events have become more frequent
- 26 per cent of people believe the UK will find it difficult to meet its energy needs in the next five years
- 34 per cent of people are in favour of using nuclear energy as a future source for electricity
- 59 per cent of people agree we are heading for environmental disaster unless we change our habits quickly
- only 13 per cent of people would pay more for clothes that have less impact on the environment.

A report by the Department for Environment, Food and Rural Affairs (DEFRA 2009) in 2011 found that:

- 65 per cent strongly agree or tend to agree that the Earth has limited resources
- 82 per cent strongly agree or tend to agree that people have a duty to recycle
- 61 per cent strongly disagree or tend to disagree that it's only worth doing environmentally friendly things if it saves you money
- 53 per cent are happy with what they currently do for the environment
- 75 per cent report that they waste either hardly any, a small amount or no food
- 70 per cent of people strongly agree or tend to agree that they understand the issues around sustainable fishing
- most people (79 per cent) do not know how to tell if fish and shellfish comes from sustainable stocks.

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Issues in biodiversity education

The research highlights a number of issues to consider when planning learning experiences around the topic of sustainability.

- There is a tension between social, economic and environmental considerations in sustainability issues.
- It is not always clear what the role of science is within socio-scientific issues.
- Sustainability is not a subject in itself, it is a theme that cuts across formal curricula.
- The socio-scientific concept of sustainability does not easily fit within many formal science curricula.
- There is a risk that within science education sustainability may be oversimplified, diminishing social and ethical dimensions, while exaggerating the role of technology and the importance of technical expertise at the expense of non-STEM disciplines and nontechnical expertise.

Jickling (1992) highlights an issue that is still relevant today, arguing that educating pupils for sustainable development raises questions about whether 'education should aim to advance a particular end such as sustainable development' or 'to make people behave in a certain way', compared with enabling 'students to debate, evaluate and judge for themselves the relative merits of contesting positions'. The main issue appears to be the relative emphasis/priority given to social, economic and environmental considerations. Dealing with sustainable development issues involves acknowledging competing value positions and interests. This tension is right at the heart of sustainability education.

Most commentators agree that education for sustainable development is not a separate curriculum subject. It is not a series of discrete concepts or topics confined to the classroom, the responsibility of just one teacher, or about transmitting a set of answers to learners. It is a theme that cuts across the curriculum.

Vikashni (2014) makes the point that 'the concept of sustainable development originates from a Western paradigm where its interpretation and implementation reflects Western culture and values' and that it can be viewed as undermining and undervaluing indigenous lifestyles.

It is not obvious how sustainability fits within science education. Feinstein and Kirchgasler (2015) make the case that although sustainability issues are not scientific per se, they do offer 'an engaging and dynamic context for science education that could increase learner interest and provide useful preparation for public engagement around socio-scientific issues.' However, they point out that there may also be risks involved in incorporating sustainability into science education. For example, by 'advancing an oversimplified idea of sustainability that diminishes its social and ethical dimensions, exaggerating the role of technology and the importance of technical expertise at the expense of non-STEM disciplines and nontechnical expertise.'

Tytler (2012) raises the issue of how to approach 'the complex and contingent nature of science knowledge as it applies to socio-scientific issues' and points out that 'the legitimacy of wider viewpoints than scientific and technological knowledge and perspectives in resolving or even understanding these complex problems is universally recognized.' Similarly the contributors to the paper by Prain (2012) broadly agree that 'science knowledge and research are critical resources, but need to be contextualized and informed by relevant ethical, cultural, and pragmatic considerations.' Robottom (2012) points out that while 'empirical questions inviting scientific knowledge and investigation are nearly always present' within any socio-scientific issue, 'so too are ethical and other philosophical questions relating to what ought to be done'.

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Implications for practice

The following points summarise advice in the education research literature on how to approach creating learning experiences about sustainability:

- challenge learners to explore their own values by looking at social, economic and environmental dimensions to any sustainability issue
- use familiar case studies to enable learners to better understand the nature of multidimensional decisions
- use current/topical real-world sustainability issues to provide interest, motivation and relevance for learners
- used multiple voices to express different viewpoints, which is essential for effective exploration of sustainability issues
- ask learners to identify non-sustainable courses of action when thinking about sustainability
- use experiential, active learning approaches to improve students' thinking skills and cognitive understanding of sustainability
- ask learners to take part in in activities that contribute towards sustainability.

Herremans and Reid (2002) examine how groups of learners will often differ in what actions should be taken to achieve sustainability. They suggest that 'to understand why disagreements exist, students must understand their own values by looking at social, economic, and environmental dimensions to any issue, and think about where they would place themselves in this context.' They recommend that learning based around familiar case studies enables learners to better understand the nature of multi-dimensional decisions.' Vikashni (2014) suggests that learners should be 'given a chance to compare strengths and weaknesses of different value systems and look at alternative ethical positions to nurture environmental ethics'.

Similarly, Corney (2006) concludes that the 'literature on the strategies for educating about sustainable development largely advocates learner-centred and interactive teaching strategies, demonstrating constructivist approaches to teaching and learning'. This strategy of engaging learners centres on 'investigations and enquiries into differing viewpoints and value positions on sustainability issues, embracing discussion and debate, experiential and fieldwork activities, and investigation of future scenarios, all of which are aimed at developing a range of skills and enabling learners to develop, express and justify their own views'. In considering the competencies required to engage learning in this type of learning experiences, Corney concludes that 'educators need to be skilled in facilitating discussion in a way that makes everybody feel their opinion is valid'. Redman (2013) also advocates experiential, active learning approaches, saying that they 'improve students' system thinking skills and cognitive understanding of sustainability'. Tran (2009) finds that 'students who are given the opportunity to talk, argue, and defend their ideas in small groups show positive change in their understanding of difficult and complex concepts'.

It is clear from the literature that whether the learning scenario is a live facilitated experience, an interpreted exhibit or digital resource, multiple voices expressing different viewpoints are essential for effective exploration of sustainability issues. Bentham (2013) goes further than this, saying that good learning experiences not only communicate about sustainable development, but also require learners to take part in in activities that contribute towards sustainability.

Gresch and Bögeholz (2013) conclude that it is important that learners 'are able to identify non-sustainable courses of action' when thinking about sustainability, and that 'ecological standards (eg minimum requirements for the water quality of limnological or marine ecosystems)' should be a core part of sustainability education.

A UNESCO-funded biodiversity project exploring sustainability issues related to forestry suggested that there are eight perspectives to be considered in sustainability education programmes (UNESCO, 2014):

- **scientific:** natural cycles and phenomena
- **historical:** how natural resources and climate have changed over time
- **geographic:** resources identification in different landscapes
- **human rights:** how society, institutional capacities and adequate governance affect biodiversity
- **gender equality:** how social and cultural practices regarding access to and use of natural resources may affect men and women differently
- **values:** value of biodiversity in terms of provisioning services
- **cultural diversity:** how different cultures engage with biodiversity
- **sustainability:** how to use natural resources in sustainable ways.

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