

## Future Directions for Research in Free-Choice Environmental Learning Roy Ballantyne and Jan Packer

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Research is the means by which a discipline or field of study grows and develops its underpinning theory and guiding principles. In the field of free-choice environmental learning, this may involve developing a better understanding of visitors' needs, motivations, learning processes and learning outcomes. Research can also be applied to solve practical problems, improve practice, develop new products or procedures, and evaluate program effectiveness. Through research, we build an empirically-supported body of knowledge on which we can base decisions about best practice. Research advances by building incrementally on previous theories and research findings.

Research in free-choice environmental learning is informed by a range of disciplines, including education, psychology, sociology, geography and tourism, as well as the broader field of free-choice learning. Falk and Dierking's (2000) Contextual Model of Learning is widely accepted as a theoretical framework for understanding and investigating free-choice learning. This model conceptualises learning as being constructed over time, as the process and product of the interactions between three overlapping contexts – the personal, the sociocultural, and the physical (Falk & Dierking, 2000). The model recognises that free-choice learners have a range of prior experiences and motivations for learning that influence the way they experience the learning environment, and that learning is a cumulative process drawing from a wide variety of sources over long periods of time. The Contextual Model of Learning is consistent with recent educational theories such as constructivism (Hein, 1996; 1998) and socio-cultural theories (Schauble, Leinhardt & Martin, 1997) which view learning as an active process of meaning-making that emerges as individuals interact with phenomena and information in a social context.

In the following sections, we will discuss the ways in which free-choice environmental learning research differs from other kinds of free-choice learning research, focusing on both theoretical and methodological issues. We will then present a number of challenges which we believe free-choice environmental learning research needs to address in order to advance theory and practice in the field.

#### Theoretical Issues in Free-Choice Environmental Learning Research

The issues that distinguish free-choice *environmental* learning from free-choice learning in general, relate to the special characteristics of environmental learning, as well as the theoretical and philosophical concerns inherent in the field of environmental education. Arguments regarding the nature and purpose of environmental education abound and there is considerable debate regarding its aims, and the ways in which it is, and should be, implemented. For example, Scott and Gough (2003) identify nine different "categories of interest" which encapsulate a range of different focuses, objectives and assumptions held by those who espouse environmental learning. These range from a focus on the individual learner, to a focus on the social context; from a realist view of nature to a metaphorical one. The interests include "sharing the joy and fulfilment derived from nature"; "understanding the processes of nature"; "using environmental, conservation and/or sustainability issues as contexts for the development of skills and knowledge related to the exercise of democratic social change"; and "promoting nature as a metaphor for a preferred social order" (Scott & Gough, 2003 p54). All of these perspectives have

something to contribute to our understanding of the breadth and depth of what might be termed environmental learning, but all require very different research questions and approaches. This is a highly contested issue in environmental education. Arguably, much of the work on environmental learning in formal education contexts has involved academics and practitioners debating the nature of the subject and arguing from different paradigms, rather than undertaking research that leads to practical improvements in environmental learning, however this is defined. For the purposes of this chapter, therefore, we will focus on a particular view of environmental learning, to which we believe the mainstream of environmental educators, particularly those working within free-choice learning settings, ascribe. In this way, we hope to provide some positive suggestions for future research directions in free-choice environmental learning, without becoming immobilised by debates regarding aims and approaches to facilitating environmental learning.

The perspective we take in this paper is based on the UNESCO-UNEP description of environmental education from the Tbilisi Declaration of 1977 (UNESCO, 1977). This description “has received wide and enduring acceptance internationally and provides a useful foundation for continued action” (Environment Australia, 1999). It holds that the goals of environmental education are:

- to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
- to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment; and
- to create new patterns of behaviour of individuals, groups and society as a whole towards the environment. (UNESCO 1977, p. 26)

Thus environmental education should not only extend students’ knowledge about the environment, but should also challenge the attitudes and behaviours that form the basis of environmental citizenship (Ballantyne and Packer, 1996). According to Tilbury (1995), the decision to participate in environmental improvement is more likely to be stimulated by affective factors such as personal motivation and a sense of responsibility than by cognitive factors. Free-choice environmental learning, then, must also adopt a broad definition of learning which incorporates affective as well as cognitive aspects.

Some of the major theoretical issues underpinning free-choice environmental learning research arise from a focus on the affective aspects of learning, and include the following in relation to (1) learning outcomes, (2) learning processes, (3) learning strategies, and (4) the gap between learning and action.

### 1. Environmental Learning Outcomes Can Include Aspects Of Knowledge, Attitudes And Behaviour.

Attempts to define the nature and scope of environmental education often promote, as its ultimate aim, the development of responsible environmental behaviour (Howe and Disinger, 1991; Hungerford and Volk, 1990). Effective environmental learning thus involves not only a change or growth in understanding, but also a willingness to depart from previously held attitudes and beliefs and make commitments to new ways of interacting with the world (Ballantyne and Packer, 1996). Research in free-choice environmental learning must therefore find

ways of measuring not only changes in knowledge and understanding, but also changes in attitudes, beliefs, motivation, and behaviour, and the inter-relationships among these. For example, learning outcomes may include changes in the way people feel about particular species or the environment in general; changes in awareness, appreciation and concern for wildlife; the development of empathy; an increase in motivation or commitment; lifestyle changes; willingness to talk to others about environmental issues; joining volunteer programs; or donating to environmental organisations (Ballantyne and Packer, 2005).

## 2. Affective Factors May Be More Important than Cognitive Factors in Bringing About Free-Choice Environmental Learning

Recent theories of learning have started to take greater account of the role of emotion in learning, especially as a motivational force, influencing our selection of what we attend to, and what seems important to explore (Boler, 1999; Eich & Schooler, 2000). Emotion also plays a major role in moral judgement and attitude development (Breckler, 1993; Kaplan, 1991; Yob, 1997). Kals, Schumacher and Montada (1999) contend that rational decision making processes are not sufficient to explain engagement in environmentally responsible behaviours, and that the power of emotions such as guilt, fear or empathy must also be taken into account. Our research (Ballantyne, Fien & Packer, 2001a; 2001b; Ballantyne & Packer, 2002) has consistently found that the empathy and emotional engagement with wildlife experienced by school students on field trips to natural areas, and by participants in nature-based tourism experiences, is one of the most powerful factors contributing to the achievement of environmental education and sustainability goals.

## 3. Theories Of Attitude And Behaviour Change Can Inform The Development Of Free-Choice Environmental Learning Strategies.

If the aim of free-choice environmental learning is to encourage people to question and change their attitudes and behaviour, as well as develop their knowledge and understanding, then the strategies and techniques used to present and interpret experiences need to be informed by theories of attitude and behaviour change. One particularly influential theory in this regard has been Ajzen's (1985) Theory of Planned Behaviour. The theory posits that behaviour is a function of three categories of salient beliefs: behavioural beliefs (beliefs about the outcomes and consequences of particular behaviour); normative beliefs (beliefs relating to social pressures to perform or not perform the behaviour); and control beliefs (beliefs about our ability, knowledge, skill, resources and opportunity to perform the behaviour). Free-choice learning experiences that target the specific beliefs that people hold in relation to an environmental action are likely to be more effective in influencing people to adopt (or refrain from) that action (Ham and Krumpal, 1996). Community Based Social Marketing Theory (McKenzie-Mohr and Smith, 1999), which is an extension of the Theory of Planned Behaviour, is similarly based on identifying and targeting the barriers and benefits associated with the adoption of conservation activities. Drawing from these and other theories of attitude and behaviour change, free-choice environmental learning research needs to investigate the beliefs, barriers and benefits typically associated with different environmental behaviours. Such research will be valuable in informing the types of messages that need to be presented in order to facilitate effective environmental learning.

## 4. Motivation Theories Can Inform Our Understanding of the Gap between Environmental Learning and Environmental Action

Maehr and Braskamp (1986) define motivation in terms of the extent to which individuals invest themselves (their time, talents and effort) in a given activity. Education researchers have long recognised the importance of motivation in our understanding of human learning. The concept is particularly relevant to environmental learning, especially if we accept that the aim of such learning is to bring about responsible environmental behaviour. Adding the *free-choice* component further multiplies the importance of motivation, as participants can freely choose the extent to which they attend to, take heed of, and enact the messages presented in free-choice learning contexts. The concept of motivation incorporates cognitive, affective, behavioural and biological aspects, but it cannot simply be regarded as an individual characteristic. The situational context in which an activity is embedded is also conceived as a major constituent of motivation (Turner, 2001). Motivation is seen to impact on the selective *direction* of behaviour (why one behaviour is chosen over another); the selective *energisation* of behaviour (how much effort is devoted to it); and the selective *regulation* of behaviour (whether a particular behaviour is maintained, altered or terminated) (Ford, 1992; Locke & Latham, 1994; Pintrich, Marx, & Boyle, 1993). Clearly these factors are relevant to an individual's choice to act in an environmentally responsible manner, to devote effort and energy to such actions, and to persist in these actions in the face of barriers and obstacles. Motivation theories thus have great potential to inform research in free-choice environmental learning. Some attempts have been made to understand the motivational factors that influence participation in, and learning through free-choice learning experiences (e.g., Falk, 2006; Hood, 1983; Packer and Ballantyne, 2002). These need to be extended to inform our understanding of factors that influence the uptake of environmental actions in response to a free-choice learning experience. Perhaps, for example, different visitor groups will be more open to different types of environmental messages, and knowing this will enable these messages to be more accurately targeted (Dierking, et al., 2004; Falk, personal communication, 24 July 2007).

#### Methodological Issues in Free-Choice Environmental Learning Research

Some of the methodological issues faced by free-choice environmental learning research relate to (1) difficulties in measuring behavioural impacts; (2) the need for follow-up measures beyond the site; (3) the limitations of a purely quantitative approach and (4) the diversity of contexts in which free-choice learning occurs.

##### 1. Difficulties in Measuring Behavioural Impacts

The impact of free-choice learning experiences on participants' environmental learning is notoriously difficult to measure, especially in relation to long-term behavioural changes. While it is possible, and indeed valuable, to observe the impact of a free-choice learning experience on visitors' behaviour at the actual site of the experience, it is much more difficult to measure long-term changes to everyday environmentally responsible activities, using anything other than self-report measures. People don't always behave the way they say they behave, and so it is difficult to establish the validity of purely self-report measures. To further complicate the issue, research has demonstrated that different environmental actions appear to be relatively independent (Ebreo & Vining, 2001; Granzin & Olsen, 1991; Oskamp et al., 1991), and so changes in relation to one environmental action do not necessarily imply or predict changes in others. Free-choice environmental learning research must therefore employ multiple measures in order to assess a range of possible learning outcomes and environmental behaviours, and attempt to establish validity through triangulation.

## 2. The Need for Follow-Up Measures beyond the Site

If the aim of free-choice environmental learning experiences is to develop environmentally responsible behaviour in everyday life, there is a clear need for measures of learning outcomes that extend beyond the site itself. An often-used shortcut has been to measure the impact of a learning experience on participants' behavioural intentions as they leave the site, but clearly, there are many factors that might influence the extent to which intentions are converted into actions. Utilising follow-up measures some weeks or months after the experience provides a more realistic assessment of the behavioural impact of a free-choice environmental learning experience, however, it then becomes difficult to isolate the impact of the free-choice learning experience itself from a range of other influences. Researchers need to accept that learning is a complex process that occurs incrementally, and it is neither possible nor desirable to dissect the experience into discrete events. It will often be necessary to take a more holistic view which recognizes the synergies between multiple experiences.

## 3. The Limitations of a Purely Quantitative Approach

One of the key difficulties of assessing the educational impact of free-choice learning experiences in general, is that visitors differ greatly in their pre-visit experiences, knowledge, attitudes, interests and motivations. Learners in free-choice contexts are a more heterogeneous group than is typically the case in formal education settings (Falk & Dierking, 2000). Free-choice learning experiences are also more self-directed and personalised than formal education experiences. As a consequence of these two factors, it is often very difficult to predict the learning outcomes that may be expected from a free-choice learning experience. Quantitative measures of learning which rely on responses to a pre-determined set of items can often, therefore, miss the mark and/or fail to detect small but important changes in awareness, understanding, attitudes and behaviour. However, reliable and valid quantitative data that can be collected from large numbers of respondents are clearly necessary in order for research to progress from the exploratory stage into more rigorous hypothesis-testing and multivariate analysis. For this reason, researchers have often found it necessary to use a hybrid measurement system that entails quantification of qualitative data. Personal Meaning Mapping (Falk, 2003) is a good example of this. This method is designed to measure how a learning experience uniquely affects each individual's understanding or meaning-making process. It does not assume that all learners enter with comparable knowledge and experience nor does it require an individual to produce a specific "correct" answer in order to demonstrate learning. The procedure involves participants providing multiple responses to a "prompt" word or phrase, which are then scored on four dimensions – the extent of knowledge; the breadth of conceptual understanding; the depth or richness of understanding; and level of mastery. In our own research we have also used a method for dealing quantitatively with qualitative data. We use a set of open-ended questions designed to elicit extended qualitative responses regarding changes in understanding, attitudes and behaviours that participants attribute to the free-choice environmental learning experience. Responses in each of three categories (knowledge, attitude and behaviour) are then coded on a four-point scale from no change through to a definitive statement of new knowledge, a changed attitude, or a new behaviour that has been adopted as a result of the experience. The disadvantage of these hybrid methods, however, is their reliance on participants' insights into and ability to verbally describe their learning experience. These measures may thus be difficult to use with children or with those who are responding in a non-preferred language.

#### 4. The Diversity of Contexts in Which Free-Choice Learning Occurs

Free-choice environmental learning may occur in a range of contexts, from a fleeting glance at a television news report, to an intensive, immersive ecotourism or educational tourism experience. Thus not only do visitors differ greatly in what they bring to the experience, but also free-choice environmental learning experiences themselves are highly variable, in their duration, their aims, their intensity and their educational impact. For example, in the context of ecotourism, Weaver (2005) identifies two types of experience: the minimalist, which emphasises superficial learning opportunities and aims only to maintain the particular site or property on which the experience is based; and the comprehensive, which aims to foster deep understanding and transformation of visitors' behaviour. The minimalist approach tends to be associated with the "soft" ecotourism market, i.e., larger numbers of participants making relatively short and physically comfortable visits, while the comprehensive approach tends to be associated with "hard" ecotourism, i.e., relatively long, specialized trips that are physically and mentally challenging. According to Weaver (2005), more effort is needed to devise strategies and techniques that enable transformative outcomes to be generated through mass (or soft) ecotourism experiences. A similar challenge faces the providers of free-choice environmental learning experiences in other contexts – to devise strategies that enable even very brief free-choice learning encounters to have a transformative effect on visitors and their subsequent actions. Research is thus needed in a range of free-choice learning contexts in order to establish the generalisability of the results obtained in specific settings.

##### Challenges For Future Research In Free-Choice Environmental Learning

The following challenges that face the field of free-choice environmental learning provide ample opportunities for research.

##### 1. Advancing Theory in Free-Choice Environmental Learning

Pure, theory-based research is needed in order to establish and advance our understanding of the processes and outcomes of free-choice environmental learning. For example, further research is needed to explore the links between environmental knowledge, attitudes, motivations, intentions and behaviours in the context of free-choice learning settings. Research in free-choice environmental learning needs to go beyond the cognitive domain of learning. The role of emotion in free-choice environmental learning, attitude change and behavioural decision-making needs to be further explored, particularly in relation to the intensity of responses and their persistence over time. The salient elements within free-choice learning experiences that facilitate and support visitors' adoption of environmentally sustainable practices need to be identified. An understanding of the ways in which visitors approach and respond to different experiences is necessary in order to inform the development of strategies which maximise the effectiveness of free-choice environmental learning experiences.

##### 2. Developing Research Methodologies

Instruments and procedures for measuring all aspects of environmental learning outcomes need to be developed. As discussed above, measures of learning outcomes need to extend beyond the learning site, in both space and time; behavioural measures need to be validated using triangulation procedures and if possible direct observation measures; and techniques should

ideally incorporate both quantitative and qualitative aspects. Researchers working in different contexts and different locations need to share both their research methods and their findings in order to build a comprehensive database that will support meta-analysis.

### 3. Integrating the Cognitive, Affective and Behavioural Elements of Free-Choice Environmental Learning

In the context of formal environmental education programs, we have previously argued the importance of an holistic approach that recognises the interrelatedness of environmental knowledge, attitudes/values and behaviors (Ballantyne and Packer, 1996). Such an approach is perhaps even more important in free-choice learning settings. Research is thus needed to inform the development of free-choice environmental learning experiences that integrate the cognitive, affective and behavioural elements of environmental learning. For example, research by Ballantyne, Fien and Packer (2001a; 2001b) led to the recommendation that for maximum effect, environmental learning experiences should focus on the *evidence* of an environmental problem (particularly in relation to human impact and mismanagement), the *effects* of the problem (particularly in relation to wildlife and wildlife habitats), and the *efforts* needed to alleviate the problem (practical steps the learner can take). Free-choice learning experiences are in an ideal position to apply this approach, which clearly incorporates and integrates cognitive, affective and behavioural aspects. Further research is needed to establish the long-term impact of such an approach upon visitor environmental learning in free-choice settings, and to identify other strategies that are likely to be effective in this regard.

### 4. Balancing the Needs and Purposes of Different Stakeholders

As many free-choice environmental learning experiences are provided by profit-making enterprises, research is needed to understand the sometimes contradictory agendas of different stakeholder groups. For example, providers want to make a profit, visitors want to be entertained, protected area management agencies want to ensure that the site and/or wildlife are properly managed and protected, and the wider society wants venues for education in sustainability. Information from a variety of different perspectives will be required if these divergent needs and purposes are to be addressed. Researchers from a range of disciplines, including business, tourism, psychology, education and ecology, will need to work together in this regard. A further challenge lies in the dilemma that increased visitation to nature-based free-choice learning experiences may contribute to the destruction of the site or habitat on which the experience depends. Providing effective visitor experiences can thus be counterproductive, unless appropriate management plans and visitor infrastructures are in place. Further research into the role of interpretation and education in controlling visitors' on-site behaviour may be helpful in this regard.

### 5. Balancing Professional Responsibilities

Much of the research into influencing visitors' behaviour through environmental free-choice learning experiences has been based on theories of persuasive communication or social marketing. For some, this may raise questions about the ethical issues involved in 'indoctrination' and 'behaviour modification'. In interpreting controversial issues, museums and other free-choice learning sites often prefer to take a 'balanced approach' which seeks to present a number of differing interpretations of events and issues in order to encourage visitors to engage with different viewpoints and meanings (Ballantyne and Uzzell, 1999). Such an approach avoids

the accusation of bias and is consistent with a postmodern view of meaning-making where different perspectives are equally valued. In relation to environmental issues, however, there may be a case for the active promotion of pro-environmental messages. Uzzell and Ballantyne (1998) argue that interpreters should play a positive role in leading and shaping public opinion. They argue that taking a neutral approach in response to an emotive or contentious issue is also a form of value judgement. Thus free-choice environmental learning experiences need to find a balance between their professional responsibility to present a balanced or unbiased interpretation, and their social responsibility to bring about positive societal change. Uzzell and Ballantyne (1998) argue that visitors should be encouraged to reflect on contentious issues, question their own values and beliefs, and appreciate and understand differing viewpoints, attitudes and behaviour. Research is needed to explore the most appropriate and ethical ways of bringing about positive and long-lasting behavioural changes. It may be, for example, that approaches that target emotional or behavioural responses alone, without addressing associated components of knowledge, values, beliefs and attitudes, are short-lived in their effectiveness.

## 6. Interpreting Human Impacts

There has often been a perception that visitors to free-choice environmental learning experiences such as zoos and aquariums are there to be entertained, and so may not be open to receiving confronting or challenging messages about environmental issues. Our own research suggests otherwise, however. Responses from 839 visitors to an aquarium, a marine park, and marine ecotourism experiences indicate that 89-94% of visitors at each site endorsed the statement that “Experiences like this should give people information about conservation issues”. (Ballantyne, Packer & Hughes, 2008). Free-choice learning experiences that involve any sort of contact with live animals provide optimal conditions for presenting an effective environmental message. Our research suggests that a powerful way of doing this is to make visitors aware of the impact of human actions on the animals they are observing. For example, an aquarium exhibit showing the effects on a whale of ingesting a plastic bag (mistaken for a jelly-fish) provides an excellent opportunity for interpretation designed to not only raise awareness and convey information, but also to change visitors’ everyday behaviour. Further research is needed to document the long-term impacts of this form of interpretation. Preliminary evidence from our own research suggests that this approach has the potential to motivate visitors to not only change their own behaviour, but also to promote responsible environmental behaviour with others, thus multiplying the impact of the visit.

## 7. Overcoming Action Paralysis

The recent media attention given to global issues such as climate change may exacerbate the “action paralysis” identified by Uzzell and Rutland (1993). Visitors may be so overwhelmed by the enormity of the environmental issues facing the world, that they are unable to take any action at all. It is therefore vitally important that free-choice environmental learning experiences provide positive messages that demonstrate to visitors that their actions *can* have an influence on environmental problems. They need to provide practical examples of everyday actions that visitors can take to reduce their “ecological footprint”.

## 8. Extending the Focus from Site Specific to Global Issues

Visitors to free-choice environmental learning experiences consistently report that such experiences impact on their general knowledge of, interest in, and concern for the well-being of

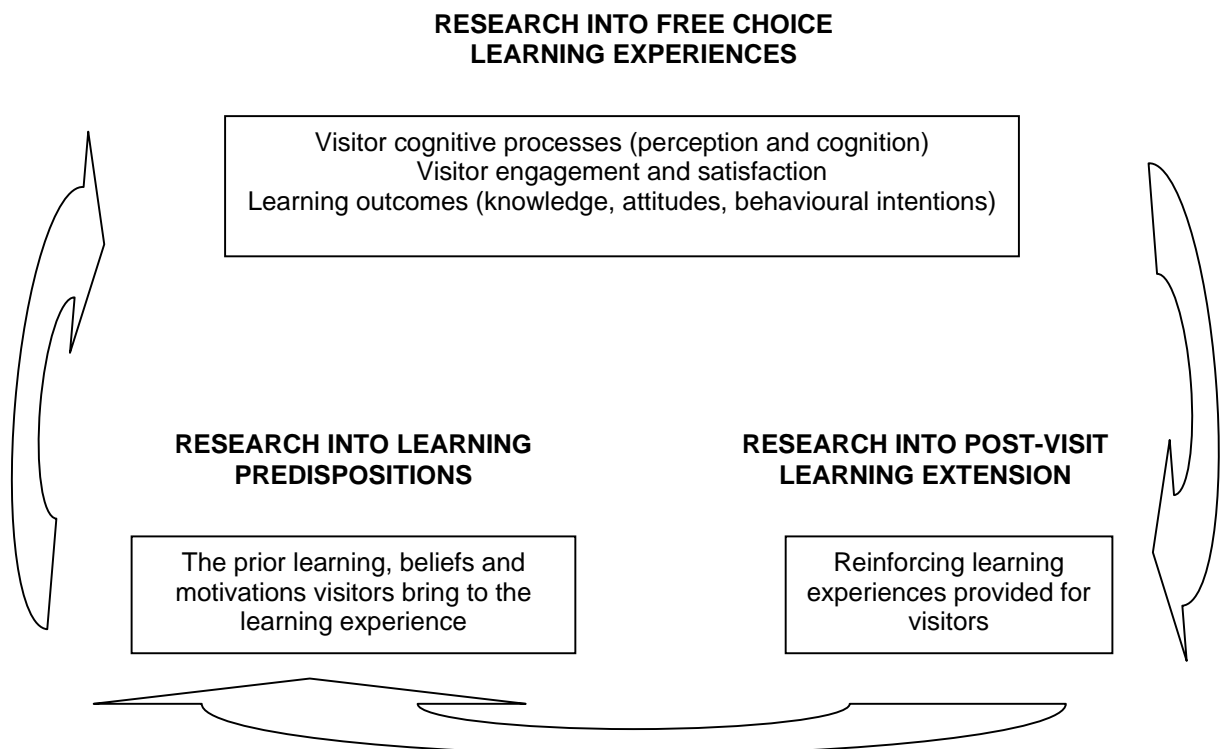


the particular animals they see in their visit (Ballantyne, Packer and Bond, 2007). They report less of an impact on their knowledge and understanding of conservation issues, and their concern for the well-being of wildlife in general. This suggests that if free-choice environmental learning experiences are to have a general impact on conservation attitudes and actions, more efforts are needed to help visitors generalize the impact of the experience beyond the specific animals they have observed. This provides a challenge for interpreters and educators, who have often been taught to focus their interpretation on the unique qualities of the animal or environment they are presenting. Research is needed to support the development of interpretation techniques that maintain this emphasis on what is special, while also extending the vision beyond the specific example, and conveying the interconnectedness of all aspects of life.

### 9. Supporting and Maintaining Long-Term Behavioural Impacts

Falk and Dierking's (2000) Contextual Model of Learning makes it clear that free-choice learning experiences do not stand alone. They are influenced by the pre-existing learning dispositions that individuals bring with them to the experience, as well as by the reinforcing learning events that occur after the experience. Until recently, most site-based free-choice learning research (for example in museums, zoos and aquariums) has focussed on the experience itself, the learning predispositions that influence and interact with the experience, and the immediate learning outcomes. Very little research work has taken place with regard to what happens after the visit. Research is needed at all three points in this process, as illustrated in Figure 1.

Figure 1. Model of research foci in the free-choice learning process



Further research is needed in the area of post-experience events that reinforce and extend the new knowledge, attitudes or behavioural intentions developed during a visit. Existing research at the National Aquarium in Baltimore suggests that visitors' immediate post-visit enthusiasm to become involved in conservation activities gradually dwindles to pre-visit levels (Adelman, Falk & James 2000; Dierking, Burtnyk, Büchner and Falk 2002). Similarly, our own research at an ecotourism site found that only a small proportion of visitors actually translated their increased awareness of, and interest in wildlife into real actions (Ballantyne, Packer and Bond, 2007).

By providing post-visit "action resources" that reinforce on-site conservation messages and provide practical examples of environmentally sustainable actions that visitors can take in their everyday home and work environments, free-choice learning experiences can extend their impact beyond the immediate space and time of the visit. Action resources are learning materials designed to reinforce tourists' on-site learning and motivate them to adopt post-visit environmentally sustainable behaviour. Such materials should build on and extend on-site conservation learning and sustainability messages and link these with post-visit behavioural responses. Action resources can be delivered through handouts given to tourists on exiting from the free-choice on-site learning experience or by accessing learning materials through the internet when they return home. Research is needed to explore the effectiveness of such materials in motivating and empowering visitors' uptake of environmental action.

### Conclusion

The suggestions for future research outlined in this paper are designed to support the development of new ways through which free-choice environmental learning experiences might promote visitors' conservation awareness and sustainable behaviour. Such research will also contribute to extending our theoretical frameworks and conceptual models for understanding the nature and impact of free-choice environmental learning experiences. In this way, research can contribute to developing the important role that free-choice learning experiences play in helping the global community develop a greater capacity to respond to the challenging environmental issues facing society today.

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