



ELSEVIER

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

SCIENCE @ DIRECT®

Ocean &  
Coastal  
Management

Ocean & Coastal Management 46 (2003) 943–956

[www.elsevier.com/locate/ocecoaman](http://www.elsevier.com/locate/ocecoaman)

# Education on marine mammal tours as agent for conservation—but do tourists want to be educated?

Michael Lück\*

*Department of Recreation and Leisure Studies, Faculty of Applied Health Sciences, Brock University,  
500 Glenridge Avenue, St. Catharines, Ont., Canada L2S 3A1*

---

## Abstract

Environmental education and interpretation became common components on wildlife viewing tours. Whale and dolphin watching tours are no exception and research suggests the implementation of educational interpretation as an agent for conservation. However, there is little knowledge on how the tourists on those tours feel about interpretation, i.e. do tourists *want* to be educated during their holidays? This study addressed this question on swim-with-dolphin tours at three locations in New Zealand. The distributed questionnaires included specific questions, but also gathered open-ended data. Results support the demand for structured interpretation programmes on marine mammal tours. Despite interpretation in place (mostly about the dolphins), respondents clearly indicated that they would have liked to receive more information, in particular about the wider marine environment.

© 2003 Elsevier Ltd. All rights reserved.

---

## 1. Introduction

It is widely accepted that education and interpretation are integral parts of tourism, especially at heritage sites and in the natural environment [1–6]. Weiler and Davis [7] note that interpretation assists the visitors to appreciate the area they are visiting. This includes an understanding and awareness for the natural environment. Interpretation ‘aims to make the visit a richer and more enjoyable experience’ [7, p. 94]. Simonds [8] suggests that through adventure-learning-programmes or through

---

\*Tel.: +1-905-688-5550x4580; fax: +1-905-984-4843.

E-mail address: [mlueck@brocku.ca](mailto:mlueck@brocku.ca) (M. Lück).

simple nature based tourism, ecological awareness can be increased when nature education is incorporated.

In a (eco-) tourism context, the terms ‘interpretation’ and ‘education’ are often used synonymously. However, with an increasing interest in interpretation and education as part of the tourist experience, researchers are more aware of distinct differences. Hammitt [9, p. 11] states, that ‘environmental education often involves a formal approach to educating while environmental interpretation is almost always informal. It is sometimes said that, “environmental education involves students while environmental interpretation involves visitors.” Taken this approach, the more formal environmental education usually takes place in a formalised setting, such as a classroom, and addresses a ‘repeat’ student as part of a captive audience. Environmental interpretation often addresses a voluntary ‘first time’ audience in a natural setting [9]. Moscardo and Pearce [10] note that interpretation is designed to stimulate interest and enthusiasm and provide an educational aspect, thus it has an entertainment and a pedagogic role. Orams [11] argues that the tourism experience must achieve more than simply providing tourists ‘a good time’. One of the most recognised definitions of interpretation dates back to 1957, when Tilden [12, p. 8] defined it as

an educational activity which aims to reveal meaning and relationships through the use of original objects, by first hand experience, and by illustrative media, rather than simply to communicate factual information.

It is now recognised, that education is part of the interpretational process. Newsome et al. [1] subdivide interpretation into an educational, a recreational, and a conservational supporting behavioural component. Although interpretational techniques can involve a variety of media, ranging from simple signs and plates to interactive displays, video screenings, to personal information provided by a tour guide, it is suggested that personal interpretation by well-trained staff is still the most effective method [13]. This is explained by the possibility of direct interaction. The tourist can ask questions and the tour guide can tailor interpretation and information to the needs of individuals or the group [14]. Roggenbruck and Williams [15] conducted research on commercial river tours and concluded that training in interpretative techniques and knowledge significantly improved visitor satisfaction. Or, on the negative side, Almagor [16] found that the major reason for visitor dissatisfaction in Moremi Wildlife Reserve in Botswana was indeed the dissatisfaction with the tour guides’ knowledge of environmental issues.

Education in marine tourism has become so important, that, for example, the International Fund for Animal Welfare (IFAW) held an international workshop on ‘Educational Values of Whale Watching’ in Provincetown, Massachusetts, in 1997 [17]. IFAW claims to be the world’s leading advocate for whale watching, because they believe it is an educational and environmentally friendly industry [18]. Also, New Zealand’s Marine Mammals Protection Regulations (1992) state in Section 6 (h) about requirements for licensing that ‘the commercial operation should have sufficient educational value to participants or to the public’.

In recognition of these events, the need for better and more structured interpretation has become predominant on marine ecotours. Concepts and models for effective interpretation have been developed for interpretation of heritage sites [2], in natural area tourism in general [1], and on marine mammal tours [19,20]. According to Gilbert [4], ecotourists are looking to gain an understanding about the environment of the local area, including its culture and wildlife. Thus, educating tourists is seen as a major mechanism of managing protected areas, for example, the Great Barrier Reef Marine Park in Australia [21].

Visitors' increasing demand for interpretation is not the only driving force for the development of effective interpretation. An equally important role of interpretation is educating the tourist in order to reduce the negative impacts of tourism [1]. Explaining the *why* and *how* are vital elements of interpretation [2].

## 2. Cognitive dissonance and affective domain

Education as a management strategy is not used to the same extent as, for example, physical or regulatory techniques. Orams [11] argues that this is because of difficulties in implementing an effective educational programme due to a variety of reasons, such as different group sizes, demographics of the participants and the fact that tourists are a non-captive audience. Ham [6] analysed distinct differences between captive and non-captive audiences. Captive audiences are usually motivated by external rewards, such as grades, certificates, and diplomas, while non-captive audiences are more internally motivated. Their rewards are intrinsic and relate to self-enrichment, self-improvement, a better life and similar rewards. In contrast to the captive audience, they are usually a voluntary audience [6]. Basis for most educational models, like the two models introduced below, is the theory that learning is the resolution of a cognitive conflict, mostly illustrated in the works of Piaget and Inhelder [22], and Festinger [23,24]. Piaget investigated the learning process of children [25] and described this conflict as 'disequilibrium', while Festinger [23] named it 'cognitive dissonance'. Both theories are based on differences between cognitive elements. 'Dissonance', 'consonance', and 'irrelevance' are the three key concepts of this theory. If two elements are consistent or supportive of one another, they are in consonance. They are dissonant, however, if they are not supportive of one another or inconsistent. Finally, if the elements have no relationship with another, they are irrelevant [20,26]. Festinger [23] suggested that dissonant elements cause a psychological discomfort. This in turn is the motivator to learning, i.e. to reduce the dissonance and achieve consonance. Four situations can cause cognitive dissonance: disagreement with others, forced compliance, decision-making, and exposure to dissonant information [20]. The latter situation is the type, which provides a chance for education through interpretation. Interpretation can deliberately cause cognitive dissonance, where the participant tries to resolve this conflict. This can be achieved either through updating the knowledge base ('accommodation') or by redefining an already existent knowledge base ('assimilation'). Fishbein and Ajzen [26] further argue that the larger the described dissonance, the more the individual will be willing

to learn in order to close this gap. In marketing, this idea is common, however, Orams [20] observes that its application to environmental education is relatively new.

The affective domain has been described as ‘that part of human thinking that includes attitudes, feelings, emotions and value systems.’ [27], in [20, p. 88]. Emotions, knowledge, and value systems have been formed to influence behaviour, thus, attention has been given to the cognitive development in education programmes, and balanced with effort on the affective domain [28]. Iozzi [29] observed that cognitive and affective factors should be part of a holistic teaching and learning process, however, he notes that in practice this is an exception rather than standard procedure. He further argues that an increase in knowledge alone will not significantly change attitudes and values. This can only be achieved through specially designed activities as part of educational programmes. Iozzi [29] suggests that this can be best achieved with issues, which involve humans’ affective domain, i.e. issues such as reproduction, life and death, birth, illness, social behaviours, and the like.

### 3. The Forestell and Kaufman model

Forestell and Kaufman [30] and Forestell [19,31] reviewed literature on cognitive psychological theory for the development of their model for effective interpretation, based on whale-watching tours in Hawaii. A key principle of their model is that a ‘direct guided experience’ is more effective than just either a ‘guided experience’ or a ‘direct experience’. With ‘direct experience’, they refer to a real-life situation, for example on a whale watch tour, without a guide, whereas a ‘guided experience’ is the exposure to a knowledgeable guide, however, not in a real-life situation. Both concepts combined lead to a guided, real-life situation, which is the most effective form. Forestell and Kaufman’s [30] model is based on a three-point approach:

1. Creating a perceived need for information;
2. Providing the needed information in an informed and interesting manner;
3. Facilitating participation in follow-up activities, which incorporate the new information into a changed behavioural repertoire.

They argue that a whale watch tour can be divided into three different stages, each of which bears different information needs (Fig. 1).

During the pre-contact stage, tourists are excited about the coming experience and have the need for information regarding their safety, the surrounding, and their

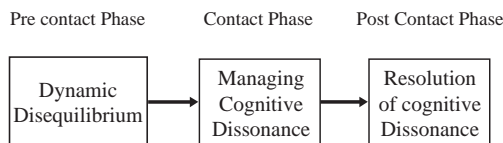


Fig. 1. Forestell and Kaufman’s interpretation model. Source: Orams [20, p. 85].

following encounter with whales. The contact phase is a time when tourists are interacting with whales. During this stage, they have specific questions about the mammals and their behaviour, as well as about the knowledge of the guides. The final, post-contact stage is a time of personal validation, in which participants compare knowledge and expectation with the just experienced encounter [30]. Forestell and Kaufman observed that during the post-contact phase, whale watchers are very receptive to environmental issues in general. In this stage, they often reconsider global environmental threats and habitat degradation. Since they just encountered marine wildlife, these threats are not abstract issues far away of their home, but very tangible issues that are affecting the whales they have just encountered. Forestell and Kaufman [30] conclude that interpretation were most effective, if a final stage would be added. The proposed follow-up activities would include lobby activities, calls for signing petitions, and making information material available to participants. Although they suggest that there is not scientific data available to support this proposition, Forestell and Kaufman [30] stress the significant opportunities of this model, including the chance to change the participants' behaviour even for other marine activities in the future, such as snorkelling, nature cruises, or diving trips.

#### 4. The Orams model

Forestell and Kaufman's model was the basis for Orams [28,32–34] to further develop this model. Orams suggests a model, which is based on five major steps, as illustrated in Fig. 2. The design of the interpretation programme includes both theories of cognitive dissonance and the affective domain, as previously discussed. An interpretation programme should offer a variety of interesting questions, so that participants become curious and develop a cognitive dissonance between the questions and their knowledge. With stories about the animals encountered, for example, marine mammals, the affective domain shall be addressed through the

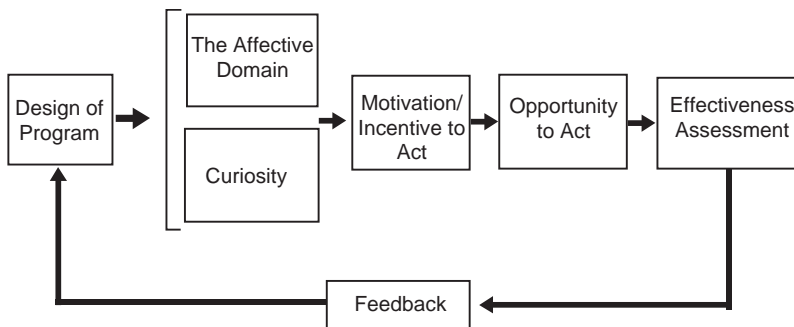


Fig. 2. Interpretation techniques (features of an effective interpretation programme). Source: Orams [32, p. 297].

involvement of participants' emotions. A state of cognitive dissonance is meant to motivate and provide an incentive to act. Orams suggests that the interpreter should address specific environmental problems and issues, and offer solutions for each participant to act.

Ideally, participants are given concrete opportunities to act during the experience, such as petitions to sign, signing up for membership of an environmental organisation, or products to purchase that support environmental research. Orams stresses the importance of this stage, because tourists are highly motivated after the experience and more likely to act than they would be once they are back at home. The final stage is crucial for the design of programme changes. Feedback and assessment are indicators for the success of the programme and should include observation, interviews of participants, or questionnaires. In order to investigate the long-term effects of the educational programme, follow-up surveys should be undertaken [33,34].

## 5. Educational aspects from the tourist's perspective

In a review of management strategies for human–wildlife interaction, Orams [35] examined physical, regulatory, economic, and educational strategies. Although Orams found a number of authors who are cynical about the idea of sustainable or environmentally sensitive ecotourism, for example, Butler [36], Wheeler [37,38], and Pleumarom [39], he concludes, that 'if the objectives of such strategies are sound, the potential exists to protect wildlife, increase visitor enjoyment and understanding, and prompt more environmentally responsible behaviour' [35, p. 45]. Aldridge [40, p. 64] defines interpretation as 'the art of explaining the significance of a place to the people who visit it, with the object of pointing a conservation message'. Many ecotour operators recognise the importance of interpretation during their tours. Fennell [3] suggests that the desired outcome of interpretation is a particular behaviour of the tourist. The IFAW [17, p. 21] sees whale watching tours, for example, as an 'enticement to get students (and teachers) interested in local species and ecosystems, and to stimulate an interest in formal schooling in cetology, oceanography, ecology and/or conservation biology'.

In many cases, when developing interpretation models and programmes, the desire of tourists is overlooked. It was discussed that educating the tourists, and the desire to change their behaviour, is a prime motivator for interpretation on wildlife tours. But do tourists *want* to be educated? McKercher [41] argues that tourists want to be entertained and are nothing but consumers. According to Poon [42] a 'new tourism' has been emerging since the early 1990s. In contrast to the 'old' tourists, these 'new' tourists are more mature and experienced, they want to be different, are more understanding, have special interests and want to learn. MacCannell [43] also argues that tourists are searching for the truth, the meaning and for authenticity in other cultures. Markwell and Weiler [44] take one step further and state that it is the (eco)tourists' commitment to act environmentally and ecologically friendly, and that this can be supported through interpreted experiences. Higham et al. [45, p. 26]

found that a number of respondents on ecotours throughout New Zealand ‘recognised the role performed by the New Zealand ecotour operator in fostering environmental awareness and challenging the environmental values of visitors in pursuit of post-experience pro-environmental behaviour’. Referring to heritage interpretation, McArthur and Hall [13] recognised a disequilibrium between the importance of interpretation objectives from a heritage management’s point of view, and the tourist’s point of view. In fact, they argue that the objectives are practised by heritage managers in the opposite order of importance to how they are perceived by visitors. Masberg and Savige [46] refer to Watson [47], and also argue that interpretive programmes usually reflect the needs and ideas of staff, rather than the needs of the visitors. They propose a new Ecotourist Needs Assessment (ETNA) model, in order to gather information about the needs and wants of tourists and then incorporate those into the interpretation programmes of the tour operators. ETNA incorporates a number of items, related to the awareness and appreciation of the area, understanding of conservation agencies and their programmes, management goals and visitor orientation. For the assessment of interpretive information, thirteen topics are provided, which visitors are to rank on a five-point Likert scale, from very unimportant to very important. The goal of ETNA is to assess the needs of ecotourists from the perspective of various stakeholders [46].

## **6. Data and methods**

During the shoulder season 2000, survey data were gathered from tourists on swim-with-dolphins tours at the three locations in New Zealand where swimming with wild dolphins is possible, namely Akaroa, Kaikoura (both South Island), and Paihia (North Island). For confidentiality reasons, the operators will not be identified in the results section, and results are not discussed in the order the operators are mentioned above. A pilot study with four different versions of a drafted questionnaire resulted in the same response rates for each version, thus a decision for the final version was made on observations during the pilot study, and on comments on the returned forms. After the pilot study, 1035 questionnaires were handed out to all participants on all tours during the survey season. Respondents had the choice to either return the questionnaire directly to the researcher or the tour staff, to take the form along and hand it back next day, or to mail it back with a provided pre-paid envelope. A return of 733 questionnaires resulted in a response rate of 70.82%. Few participants made use of the opportunity to drop off the questionnaire at the office at a later time, but 128 surveys (17.49% of all responses) were returned by mail. Among a number of questions addressing a variety of issues, respondents were asked four questions about environmental education in general, and four questions about interpretation and learning on the particular dolphin tours. The questionnaire asked respondents to rank those items on a four-point Likert scale (1 = strongly agree, 2 = mildly agree, 3 = mildly disagree, 4 = strongly disagree). The researcher deliberately chose an even Likert scale, in order to “gently force” respondents in one or the other direction. It was believed, that a neutral point was

not crucial for the items used in this study. In addition, respondents had the opportunity to add any remarks in an open-ended comments section at the end of the questionnaire. Frequencies and Analyses of Variance (ANOVA) were used in order to gain information about the mean values and the standard deviation. The data set was tested for reliability. This test resulted in a reliability coefficient (Cronbach's alpha) of 0.8309, which indicates that the results are reliable.

## 7. Results and discussion

Generally, respondents agreed that the tour staff had good knowledge about dolphins (mean=1.35) and that the tour was an educational experience (mean=1.98). However, when asked if they had learned a lot about the dolphins and about marine life in general, many respondents disagreed or strongly disagreed (Table 1).

Particularly at one location, the respondents felt that more information should have been provided. This is a direct result from the fact that during the survey period, the operator did not have a guide on board. This is strongly supported by additional comments, such as 'I would've liked more info about the dolphins and the ecosystem of this place', 'I think the tours should have more info about the dolphins and their lifestyles', 'more information about dolphins could have been provided', 'I would advise the tour brings in an element of education telling visitors about the dolphins, marine environment, restrictions & regulations by DOC [Department of Conservation], etc.', and 'I'd like to have more info about dolphin life & Hector dolphins in general', to mention but a few.

The second operator provides very good interpretation both during the briefing and the tours. Despite this, there were some comments suggesting that the

Table 1  
Educational aspects on dolphin tours

|  | Strongly agree (%) | Mildly agree(%) | Mildly disagree (%) | Strongly disagree (%) | Mean | SD   |
|--|--------------------|-----------------|---------------------|-----------------------|------|------|
| The dolphin tour was an educational experience                               | 29.6               | 47.1            | 18.5                | 4.8                   | 1.98 | 0.82 |
| I have the feeling that on this tour I learned a lot about dolphins          | 17.6               | 45.7            | 29.4                | 7.3                   | 2.26 | 0.83 |
| I have the feeling that on this tour I learned a lot about other marine life | 5.2                | 16.4            | 44.7                | 33.7                  | 3.07 | 0.84 |
| The dolphin tour staff had good knowledge about dolphins                     | 69.3               | 27.1            | 3.2                 | 0.4                   | 1.35 | 0.56 |

*Note:* 1 = strongly agree; 2 = mildly agree; 3 = mildly disagree; 4 = strongly disagree.

educational part of the tours could be improved, such as ‘Would have been nice to know a bit more about the actual types of dolphins we would encounter before the swim’, ‘the information provided of dolphins and their life in the area was quite limited’, ‘The commentary was a bit quiet so I didn’t learn as much about the wildlife as I might have done’, and ‘They could mention the dangers of rubbish & pollution in the ocean with regards to dolphins & marine life’.

The highest marks for interpretation and education were awarded to the third operator, which can be explained by the enthusiastic and knowledgeable guide. Even after many tours, the guide is still very excited about the marine mammals and is able to transfer this enthusiasm to the passengers on board. Despite the high ratings, there were some comments suggesting improvements on the tours at this location as well: ‘Apart from the dolphins, the guide can introduce a bit about coastal features (e.g. sea cave, sea arch...), trees and habitats on the outlying islands and mention something about marine lives in the waters nearby’, ‘Information & educational packs would enhance the experience’, and ‘better reading & visual information or orally’.

On the other hand, there were a number of positive aspects about the interpretational and educational parts of the tours at all three locations as well. At the first location, respondents commented: ‘knowledgeable driver’, and ‘I appreciated the perseverance of the skipper, his encouragement & knowledge of dolphins’. The positive remarks of respondents at the first location were mostly complimenting the knowledge of the skipper. However, there were three times as many suggestions, that the tours should provide more information about dolphins, the habitat and the general environment. Clearly, these comments underline the necessity of having a knowledgeable tour guide on board, since it is expected too much of the skipper to handle the vessel, take care of the swimmers, watch the dolphins, and provide adequate interpretation.

At the second location, 13 participants appreciated the knowledge of the crew and the education during the tour. Some comments were: ‘The packs we received after the day look very informative about dolphins’, ‘staff friendly and knowledgeable’, ‘I appreciate what you are doing & the role of education in today’s world’, and ‘informative (both on and off the water)’.

The positive comments at the third location mostly related to the knowledge of the crew and to the reading material that is on display on board. During the tours, passengers have the opportunity to read a variety of brochures and books about dolphins and the marine life in the area. Positive comments included ‘I enjoyed reading the books about dolphins that were on board’, ‘very knowledgeable and friendly staff’, ‘the knowledge and interaction was wonderful’, and ‘the boat crew were helpful & ready to answer all questions’.

Respondents were asked four general questions regarding environmental education. These included two questions about the individual’s learning during their holidays, one question about environmental education in schools, and one general statement regarding learning about wildlife. Responses to these questions were amongst the highest ranked throughout the entire survey (Table 2). Almost all respondents (98.2%) strongly or mildly agreed that courses focusing on the

Table 2  
Learning about wildlife and nature

|   | Strongly agree (%) | Mildly agree (%) | Mildly disagree (%) | Strongly disagree (%) | Mean | SD   |
|---|--------------------|------------------|---------------------|-----------------------|------|------|
| Courses focusing on conservation of natural resources should be taught in primary and secondary schools | 72.2               | 26.0             | 1.6                 | 0.1                   | 1.30 | 0.50 |
| Learning new things/increasing my knowledge (importance for holidays in general)                        | 66.4               | 30.5             | 2.9                 | 0.1                   | 1.37 | 0.55 |
| It is important that we learn as much as we can about wildlife  | 66.1               | 29.4             | 3.7                 | 0.8                   | 1.39 | 0.60 |
| I enjoy learning about wildlife during my holidays  | 46.1               | 45.4             | 8.1                 | 0.4                   | 1.63 | 0.65 |

Note: 1 = strongly agree; 2 = mildly agree; 3 = mildly disagree; 4 = strongly disagree.

conservation of natural resources should be taught in primary and secondary schools (mean = 1.30). Similarly, 95.5% strongly or mildly agreed that it is important that we learn as much as we can about wildlife (mean = 1.39). Roggenbruck et al. [48] report that when asked what kinds of satisfaction respondents derived from their favourite recreational activities, both men and women ranked ‘a chance to learn new things’ and ‘it gives me a chance to develop skills’ under the eight most important factors. The importance of this was underlined by Moscardo [49], who found in two surveys in Queensland/Australia in 1994 and in 1996, that the motive ‘learn new things’ or ‘increase knowledge’ ranked on places four and one, respectively. Participants in dolphin tours seem to confirm this importance, but although 66.4% of the respondents indicated that learning new things and/or increasing their knowledge is very important and 30.5% somewhat important during their holidays in general (mean = 1.37), the enjoyment of learning is not equally strong (Table 2). Here, 46.1% strongly agreed and 45.4% mildly agreed that they enjoy learning about wildlife during their holidays (mean = 1.63).

At all three locations of this study, it was observed that the crews set positive examples through direct action. Several times during tours, skippers and/or guides spotted floating rubbish, stopped the vessel and retrieved the rubbish. This was acknowledged in a comment where a New Zealander said that ‘the staff knowledge and interaction was wonderful. If the plastic bag had not been retrieved that would have been what I remembered most about my experience, but because you went back and got it I remember your wonderful care for the dolphins and other wildlife’.

Personal observations and communications with the tour operators revealed that none of the operators has a comprehensive interpretation model in place. The quality

of interpretation and education depends mostly on the tour guides and skippers at two of the locations, while at one location, the operator has a training programme for staff in place. However, dedicated interpretational planning, such as discussed earlier in this paper are not in place. All dolphin tour operators participating in this study could greatly improve the quality of their interpretation, and thus the tourist satisfaction, by developing a structured comprehensive interpretation programme, adopted from the models suggested by Forestell and Kaufman [30] and Orams [32]. It is suggested that particular focus is placed on the cognitive aspects of the programmes, and on the opportunity to act in the last stage of the model.

## **8. Conclusion**

It was outlined that interpretation and education are components of increasing importance on marine wildlife tours. Forestell and Kaufmann [30] and Orams [32] acknowledged this importance and developed models for structured and successful interpretation on marine mammal tours. Observations and interviews on swim-with-dolphins tours in New Zealand indicate that planned and structured interpretation programmes are absent at all three locations. The presented data supports the demand of Forestell and Kaufmann [30] and Orams [32] for implementation of structured educational programmes. But probably more important is the fact that participants in dolphin tours expect interpretation and education. In fact, the results indicate that particularly on the dolphin tours they would have liked to get more information about the marine mammals, but also about the marine environment in general. This desire seems to be even more important, because many respondents used the open-ended section at the end of the questionnaire for those suggestions, i.e. they were not directly asked to state if they would have liked to learn more during the particular tour. These findings have significant implications for the management of marine environments. Effective interpretation provides natural area managers with the unique opportunity to raise awareness and educate tourists about environmental problems in the particular setting. It is suggested that the audience on dolphin tours is very receptive for those issues, because despite relatively good interpretation being already in place, many participants would have liked to receive even more detailed information. The information provided on board of the three tour operators addresses the dolphins to a large extent; comments of many respondents however indicate that there is a demand for information about the wider environmental issues and regulations associated with the visited area. Interpretation programmes, such as those suggested by Forestell and Kaufmann [30] and by Orams [32], are vital for effective interpretation and should be adopted by dolphin operators. This not only benefits the tourists on board in providing them the obviously desired information (and thus increases satisfaction), but also the environment. Ideally, participants translate this information and concern for the environment into action, either through financial support of environmental organisations, or through actions taken at home, such as recycling.

## Acknowledgements

The author would like to acknowledge Dr. James Higham, Dr. Alison McIntosh, and Dr. Hazel Tucker (all University of Otago) for their guidance and expertise throughout this programme. He also wants to thank Prof. Geoff Kearsley and Prof. C. Michael Hall, and the Department of Tourism, University of Otago, for their support and funding. Also, thank you to the dolphin tour operators (Dolphin Encounter, Dolphin Experience, Dolphin Discoveries) and their teams for the enthusiastic and unconditional support of this project. Last, but not least, thanks to all tourists who took a few minutes of their holiday time to fill in the questionnaire!

## References

- [1] Newsome D, Moore SA, Dowling RK. Natural area tourism. Clevedon: Channel View Publications; 2002.
- [2] Uzzell D, Ballantyne R, editors. Contemporary Issues in Heritage & Environmental Interpretation. London: The Stationary Office; 1998. p. 260.
- [3] Fennell DA. Ecotourism: an introduction. London New York: Routledge; 1999.
- [4] Gilbert J. Ecotourism means business. Wellington: GP Publications; 1997.
- [5] Hall CM, McArthur S, editors. Heritage management in Australia and New Zealand. Oxford: Oxford University Press; 1996.
- [6] Ham SH. Environmental interpretation: a practical guide for people with big ideas and small budgets. Golden: North American Press; 1992.
- [7] Weiler B, Davis D. An exploratory investigation into the roles of the nature-based tour leader. *Tourism Management*, 1993;14(2):91–8.
- [8] Simonds MAC. Natural encounters: adventure, learning, and research programs for the marine environment in 1990 Congress on Coastal and Marine Tourism: a symposium and workshop on balancing conservation and economic development. Honolulu, Hawaii: National Coastal Resources Research & Development Institute, 1990.
- [9] Hammitt W. Cognitive processes involved in environmental interpretation. *Journal of Environmental Education*, 1984;15(4):11–5.
- [10] Moscardo G, Pearce PL. Visitor centres and environmental interpretation: an exploration of the relationship among visitor enjoyment, understanding and mindfulness. *Journal of Environmental Psychology* 1986;6:89–108.
- [11] Orams MB. Marine tourism: development, impacts and management. London, New York: Routledge; 1999.
- [12] Tilden F. Interpreting our heritage. Chapel Hill: The University of North Carolina Press; 1957.
- [13] McArthur S, Hall CM. Visitor Management: principles and practice. In: Hall CM, McArthur S, editors. Heritage Management in Australia and New Zealand. Oxford: Oxford University Press; 1996. p. 37–51.
- [14] Aiello R. Interpretation and the marine tourism industry, Who needs it? A case study of Great Adventures, Australia. *The Journal of Tourism Studies*, 1998;9(1):51–61.
- [15] Roggenbruck JW, Williams DR. Commercial tour guides's effectiveness as nature educators. World Congress on Leisure and Tourism, Sydney, 1991.
- [16] Almagor U. A tourist's "Vision Quest" in an African game reserve. *Annals of Tourism Research*, 1985;12(1):31–48.
- [17] International Fund for Animal Welfare, Proceedings of the Educational Values of Whale Watching Workshop (08–11 May). Educational Values of Whale Watching Workshop, I.F.f.A. Welfare, International Fund for Animal Welfare: Provincetown, MA, 1997.

- [18] International Fund for Animal Welfare, Using science to save whales. International Fund for Animal Welfare, 2001.
- [19] Forestell PH. Marine education and ocean tourism replacing parasitism with symbiosis in 1990 congress on Coastal & Marine Tourism: a symposium and workshop on balancing conservation and economic development. Honolulu, Hawaii: National Coastal Resources Research & Development Institute, 1991.
- [20] Orams MB. Using interpretation to manage nature-based Tourism. *Journal of Sustainable Tourism*, 1995;4(2):81–94.
- [21] Hockings MA. Survey of the tour operator's role in Marine park interpretation. *The Journal of Tourism Studies*, 1994;5(1):16–28.
- [22] Piaget J, Inhelder B. *The psychology of the child*. London: Routledge & Kegan Paul; 1969.
- [23] Festinger L. *A theory of cognitive dissonance*. London: Tavistock Publications; 1957.
- [24] Festinger L. *Conflict, decision & dissonance*. London: Tavistock Publications; 1964.
- [25] Klausmeier HJ and Associates. *Cognitive learning and development: information-processing and piagetian perspectives*. Cambridge: Ballinger Publishing, 1979.
- [26] Fishbein M, Ajzen I. *Belief, attitude, intention and behaviour: an introduction to theory and research*. Reading, MA: Addison-Wesley; 1975. p. 578.
- [27] Eiss A, Harbeck M. *Behavioural objectives in the affective domain*. Washington, DC: National Science and Teachers Association; 1969.
- [28] Orams MB. Creating effective interpretation for managing interaction between tourists and wildlife. *Australian Journal of Environmental Education* 1994;10:21–34.
- [29] Iozzi LA. What research says to the educator—Part one: environmental education and the affective domain. *Journal of Environmental Education* 1989;20(3):3–9.
- [30] Forestell PH, Kaufman GD. The history of whale watching in Hawaii and its role in enhancing visitor appreciation for endangered species. 1990 Congress on Coastal and Marine Tourism: A Symposium and Workshop on Balancing Conservation and Economic Development. 1990. Newport, Oregon: National Coastal Resources Research and Development Institute.
- [31] Forestell PH. If Leviathan has a face, does Gaia have a soul?: incorporating environmental education in marine Eco-tourism programs. *Ocean & Coastal Management* 1993;20:267–82.
- [32] Orams MB. The effectiveness of environmental education: can we turn tourists into 'Greenies'? *Progress in Tourism and Hospitality Research* 1997;3(4):295–306.
- [33] Orams MB. An interpretation model for managing marine wildlife-tourist interaction. *Journal of Sustainable Tourism*, 1996;4(4):81–95.
- [34] Orams MB. The role of education in managing marine wildlife—tourist interaction in 7th annual marine education society of Australasia conference. Brisbane: Marine Education Society of Australasia; 1993.
- [35] Orams MB. A conceptual model of tourist-wildlife interaction: the case for education as a management strategy. *Australian Geographer* 1996;27(1):39–51.
- [36] Butler RW. Alternative tourism: Pious Hope or Trojan Horse? *Journal of Travel Research* 1990;28(3):40–5.
- [37] Wheeler B. Tourism's troubled times: responsible tourism is not the answer. *Tourism Management* 1991;12(2):91–6.
- [38] Wheeler B. Ecotourism: a ruse by any other name. In: Cooper CP, Lockwood A, editors. *Progress in tourism recreation and hospitality management*, Vol. 6. Chichester: Wiley; 1994. p. 3–11.
- [39] Pleumarom A. What's wrong with mass ecotourism? *Contours*, 1993;6(3–4):15–21.
- [40] Aldridge D. How the ship of interpretation was blown off course in the tempest: some philosophical thoughts. In: Uzzell D, editor. *Heritage interpretation the natural and built environment*, Vol. 1. London: Belhaven Press; 1989. p. 64–87.
- [41] McKercher B. Some fundamental truths about tourism: understanding tourism's social and environmental impacts. *Journal of Sustainable Tourism* 1993;1(1):6–16.
- [42] Poon A. *Tourism, technology and competitive strategies*. Wallingford: C.A.B. International; 1993.
- [43] MacCannell D. *The tourist: a new theory of the leisure class*. London: The MacMillan Press; 1976.

- [44] Markwell K, Weiler B. Ecotourism and interpretation. In: Uzzell D, Ballantyne R, editors. *Contemporary Issues in Heritage & Environmental Interpretation*. London: The Stationary Office; 1998. p. 98–111.
- [45] Higham J, Carr A, Gale S. *Ecotourism in New Zealand: Profiling visitors to New Zealand Ecotourism Operations*. Research Papers, Vol. 10. Department of Tourism, University of Otago, Dunedin, 2001.
- [46] Masberg BA, Savige M. Incorporating ecotourist needs data into the interpretive planning process. *The Journal of Environmental Education*, 1996;27(3):34–40.
- [47] Watson M In: . *An interpretive challenge: the US National Park Service approach to meeting visitor needs heritage international*, Vol. 2. London: Belhaven Press; 1989.
- [48] Roggenbuck JW, Loomis RJ, Dagostino J. The learning benefits of leisure. *Journal of Leisure Research* 1990;22(2):112–24.
- [49] Moscardo G. Interpretation and sustainable tourism: functions, examples and principles. *The Journal of Tourism Studies* 1998;9(1):2–13.