

Awareness and Monitoring in Outdoor Marine Education¹

By Carl Stepath²

Abstract: This paper examines learning relationships associated with awareness, attitude and participatory action skills in the context of community education programs concerning the marine environment. Community education programs have placed considerable focus on improving environmental awareness, while an associated change in ecological participatory action skills has failed to materialize. Increasing the awareness or improving the knowledge of stakeholders in our communities is important in realizing that a problem exists, but this change appears to do little to rectify ecological problems. As environmental awareness is raised and attitudes improved, minimal changes in associated ecological action skills have followed. If promoting ecological sustainability and increasing community participation are desired outcomes, then the relationship between awareness, attitudes and ecological action needs investigation. A possibility for improving awareness while also increasing participatory action skills and responsible environmental behavior and associated outdoor education techniques is presented in this paper. Coral reef monitoring is discussed as an experiential approach to marine education. The attempt is to conceptually investigate the relationship of experiential marine education to environmental knowledge, attitudes and responsible ecological behavior of participating students.

Keywords: marine experiential education, transformative learning, agency

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Introduction

The following paper is an examination of learning relationships associated with marine awareness, attitude and ecological agency. As the amount of awareness or knowledge is increased, an associated change has not developed to actually solve ecological problems (agency). The enhancement of environmental awareness and attitudes has had minimal effect on associated changes in ecological action skills. If educational outcomes are to include ecological sustainability and increasing community participation, then it appears necessary to evaluate the awareness, attitudes and ecological action connection used in many formal education pedagogies. Experiential approaches to marine community education; such as coral reef monitoring is presented as a means of improving student learning outcomes of participatory action and responsible environmental behavior.

If an educational project's expected outcome is to improve responsible environmental behavior, then raising awareness is not enough. Awareness is defined by Newhouse (1990) as being knowledgeable, awake, alert and informed, and is not necessarily taking action. When developing community education programs it is extremely important to construct desired outcomes and then develop strategies to implement them in a coordinated manner so as to promote participatory action skills. One set of successful education outcomes is the Marine Education Association of Australasia's (MESA) Three A's of coastal and marine education, which are improving awareness, attitudes and action. Other similar outcomes of improving awareness, sensitivity, attitudes, skills and participation are outlined by the Hungerford and Volk (1990) synopsis of the UN's 1978 Tbilisi Intergovernmental Conference on Environmental Education. These guidelines have been developed for many years, and this could be the time for developing educational programs which carry them out.

Many community environmental education campaigns are organized to increase awareness about the importance of marine issues and coral reefs. An increased awareness of the ecological relationships between coral reefs and associated human environments appears to be important, and the public needs to be knowledgeable about potential resource problems and their causes to alleviate those problems (U.S. Coral Reef Task Force, 2000). Knowledge is an important first step, but it is not sufficient to change peoples' actions (Finger, 1994). As the health of the marine environment and coral reefs are deteriorating internationally, it is time to take effective steps to help solve the problem.

Experiential outdoor education is the transfer of knowledge through learning in situations that include direct contact and interaction with the item of study and usually takes place outdoors. It can be thought of as learning through “the process of actively engaging students in an experience that will have real consequences” (Stevens & Richards, 1992, p. 1). Experiential and environmental studies are very important in education and learning (Quay, 2003; Stepath, 1998), and this method of teaching is an excellent way of facilitating meaningful learning, while promoting active involvement in related community issues (Eyler, 2002). Marine education is that part of the educational process that enables people to develop sensitivity to and a general understanding of the role of the seas in human affairs and the impact of society on the marine and aquatic environments (Fortner, 1991). Coral reef monitoring is one type of marine experiential education activity that focuses the students’ learning on the ecological nature of reefs. If translating environmental awareness into action skills (agency) becomes a desired outcome, then outdoor learning and experience is an interesting teaching technique for achieving this goal.

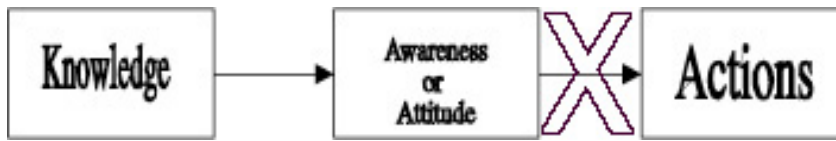
Education, Awareness and Agency

Additional knowledge or awareness is important, however many educational research studies show that "issue awareness does not lead to behavior in the environmental dimension" (Hines, Hungerford and Tomera, 1986/1987; Hungerford & Volk, 1990, 2003; Hsu, 2004; Jensen & Schnack, 1999; Newhouse, 1990). This is also a major concern of Marcinkowski (2001, p. 110-111) who states:

the most popular program theory operating in EE [Environmental Education] and, quite possibly ARE [Aquatic Resource Education], is known as the knowledge-attitude-behavior (KAB) model. The kinds of behavior (B) of interest here are the wide range of stewardship behaviors that are collectively known as Responsible Environmental Behavior (REB). Unfortunately, the growing body of research about REB both within and outside the field of EE clearly demonstrates that this is an overly simplistic model: the K-A-B relationships are neither direct nor linear, and there are more variables and phases involved in the process of forming or shaping REB).

A traditional view toward education is that students are taught knowledge and become aware so their attitudes are altered and then their actions change to coincide with the new knowledge and attitude. This classical education belief has been found to be untrue (Figure 1).

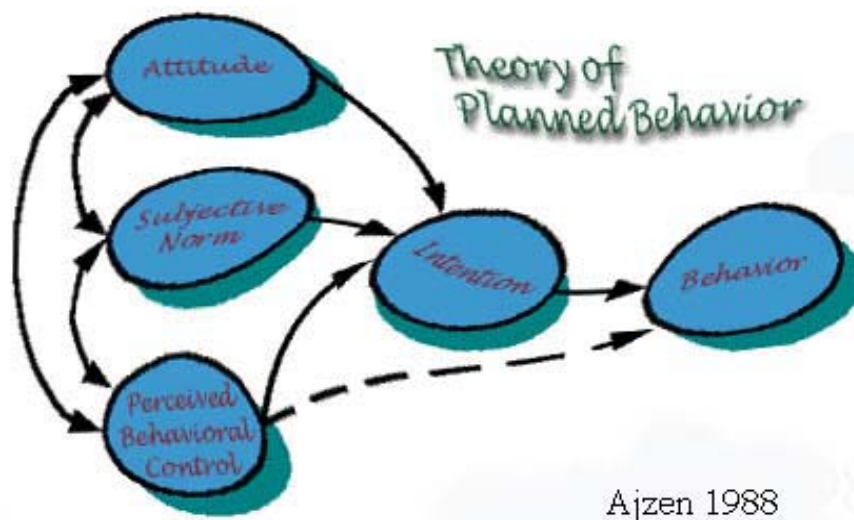
Figure 1. Behavioral Change System



Hungerford & Volk, 1990, as modified by Stepath 2004

This process of moving from knowledge to action (agency) skills should not be thought of as a linear relationship. In fact, there is an almost zero to moderate relationship between awareness, attitudes, and participatory action (Hines, et al. 1986/67; Hungerford & Volk, 1990; Gigliotti, 1990; Klein & Merritt, 1994; Matthews & Riley, 1995; Kaiser & Gutscher, 2003). Promoting ecological agency or participatory action is very eclectic and cannot be depicted graphically. In an attempt to show the complexity of these interconnections, an over simplified graphic of this extremely complicated situation is used to depict some of the associations involved. One perspective for examining these affiliation dynamics is shown in Ajzen's (1988) Theory of Planned Behavior (Figure 2). This non-linear relationship is very complicated, and affected by a number of extraneous factors. Here the diagram shows behaviors being shaped by a number of factors including attitudes, subjective norms and perceived behavioral control (Figure 2). Attitude is "best considered to be a person's degree of favorableness or unfavorableness with respect to a psychological object" (Ajzen & Fishbein, 2000), and is the third goal of Environmental education. An environmental attitude can then be defined as a learned predisposition to respond in a consistently favorable or

Figure 2. Theory of Planned Behavior Model



unfavorable manner with respect to the environment (Shanahan, Pelstring & McComas, 1999). It is also possible to construe environmental attitudes as ways in which people feel about and acknowledge the physical environment of planet Earth. These positive attitudes are desired outcomes from environmental education, but their relationship to responsible environmental behavior is not strong, since it is only one factor among many. What's more, the society in which the participants live, and its pressure upon them are very important (subjective norm). People's ability to perform (perceived behavioral control), their locus of control, is also very important. Thus, many elements shape one's ability to act in numerous different ways, and not just in a linear fashion from one's knowledge or attitude.

Therefore, a holistic lifestyle modification or transformation process (Takahashi, 2004), rather than a simplistic linear awareness cause and effect point of view needs to be considered when designing long-term education strategies and programs. Especially, since irreversible harm to environmental conditions that support life on Earth are increasingly being caused by human actions (Oskamp, 2002). These influences that lead to transforming one's consciousness make it critical that the design of education programs are done by qualified personnel with experience developing outcome oriented strategies and curriculum. The importance of holistically oriented programs have been traditionally undervalued, and therefore, it is necessary to re-evaluate educational strategies. A process for determining appropriate actions and outcomes is to consider the definition of an environmentally responsible citizen (Hungerford & Volk, 1990). It is a person who has:

- 1) An awareness and sensitivity to the total environment and its allied problems;
- 2) A basic understanding of the environment and its allied problems;
- 3) Feelings of concern for the environment and motivation for actively participating in environmental improvement and protection;
- 4) Skills for identifying and solving environmental problems;
- 5) Active involvement at all levels in working toward resolution of environmental problems.

This list makes one want to ask 'How can we become better environmentally responsible citizens?'

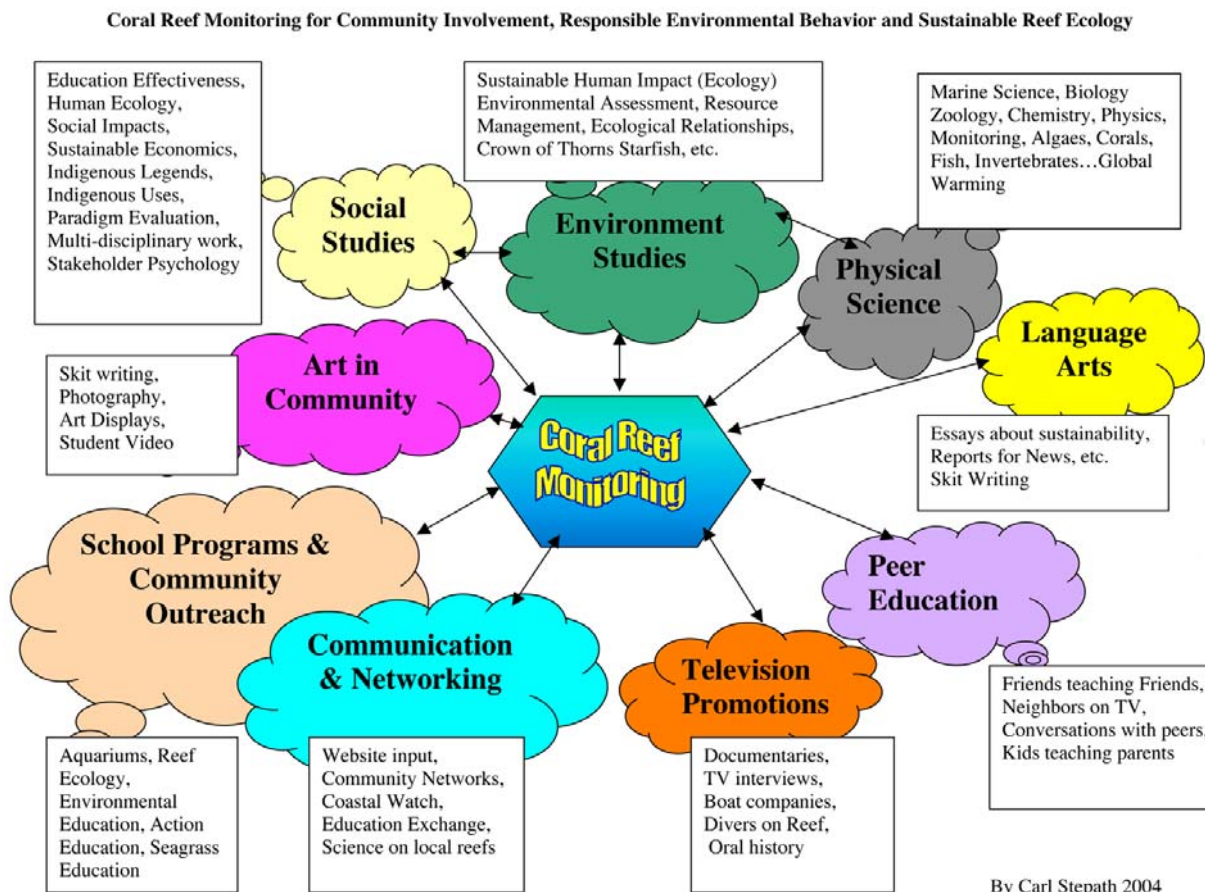
One strategy for promoting active involvement in communities is to implement local monitoring activities (Robottom, 2004). These monitoring exercises not only improve the participants' knowledge about the ecosystem, but also teach ecological relationships and

agency skills. This type of hands-on approach in the water generates baseline information for resource managers while promoting participatory action. It is extremely important for citizens interested in promoting reef sustainability to become involved in the complex interactions of the coral reef ecosystem so they will be able to choose the proper personal actions to take individually. This technique of initiating community-based monitoring projects gets stakeholders involved in a physically and cognitively involved manner. In reef neighboring communities, coral reef monitoring is an activity that demonstrates to citizens how they can be actively involved. Newhouse (1990), when citing Morgan and Gramman (1988), says that the technique most effective in producing positive change was modeling and actually experiencing a situation. These activities foster an increased awareness of coral reef habitats, as they educate about the human-reef relationship, promote improved environmental sensitivities, and introduce favourable environmental agency skills (Eyler, 2002). Coral reef monitoring is an important tool for getting people involved and establishing baseline ecological information for environmental management purposes.

This type of monitoring activity can help reefs and other habitats through ecological education that teach preservation concepts, data collection and introductions to management skills for stakeholders. Therefore, these participants are getting involved with the resource on a number of different levels (Robottom, 2004), and establish a meaningful relationship with the reef. Since, “no coral reefs can be isolated from the human communities surrounding and using them” (Talbot, 1995, p. 2) community education projects can be designed with this in mind. According to Gardner (1991), in his description of multiple intelligences, many more learning abilities exist besides standard mathematics and language instruction, and these include kinaesthetic, artistic and spatial. Outdoor education addresses and expands many Gardner’s and many other ways of learning as it increases the skills acquired by participants. The mind map in Figure 3 depicts the various influences of coral reef monitoring and shows a number of areas of diverse learning styles affected. Environmental monitoring programs provide an opportunity for participants to expand their ecological competence by learning community involvement and sustainable ecological agency skills. Participants in environmental monitoring programs learn many of the ecological relationships depicted in the mind map in Figure 3. This all helps to build a greater connection with the natural world and its deep subjectivity, while opening up a new sense of participant intimacy. An intimacy and connection with the natural world is cultivated as people begin to see and value a

differentiated consciousness of the world outside the human (O’Sullivan, 1999; O’Sullivan & Taylor, 2004).

Figure 3. Mindmap of Learning Relationships in Monitoring Program Participation



These ecological relationships and the knowledge gained from learning relationships developed in program participation are important for ecological sustainability. Active monitoring participation by stakeholders provides a very positive understanding in experiential situations which contribute to increased awareness, concern and continued learning about coral reef ecology (Stepath, 1997), while actually getting them involved in an interaction with the reef. Well-coordinated and designed monitoring programs are most effective when linked with expanded and inclusive types of environmental outreach projects. It is critical for people to understand the importance of the ecological system and their place within it, and hands-on experience helps generate these holistic realisations.

When participants in this style of learning activity recognize their part in the living ecological system, a greater connection with the natural world and its inter-connectedness becomes more apparent. “The underlying belief-value structure that most needs changing is the myth that people are separate from the environment--that we are somehow different from all other living things” (Gigliotti, 1990, p 10). Community-based monitoring programs are an excellent means of promoting ecological sensitivities, because the participants establish a relationship with habitat from which they are collecting data. Outreach programs and community education strategies are extremely effective when done in conjunction with direct experience programs, especially where strategic outcomes are considered and coordinated.

Conclusion

If ecological participatory action is a desired learning outcome, then it is important to re-evaluate our experiential and environmental education teaching strategies in order to determine if they are working. If only a fraction of our young learners are being exposed to logically developed, well-articulated environmental education programs (Hungerford & Volk, 1990), the marginalisation of environmental education in the school system itself (Gough, 1997) could be the cause of poor performance. Orr (1999, p. 232) argues that the skills, aptitudes, and attitudes that were necessary to industrialise the Earth are not the same as those that are needed now to heal the Earth. Limitations in current resources for educational systems make it necessary to evaluate environmental information and interpretation programs to insure the ability to be effective in meeting long-term goals and outcomes.

Resources available for community education are limited and maximizing outcomes is important. It is critical that people with significant training in educational design and strategies are utilized in order to attain the most dynamic results. Currently, many project coordinators have very limited training in environmental education and are not focusing on project generated learning outcomes. Community-based monitoring programs can help by bridging the gap between many differing factions in the community, and offering situations where people of varying backgrounds contribute, get involved, establish relationships, learn science and help implement change through interaction with nature (Fien, 2003; Fine, 1992). Environmental education work, outreach programs and media campaigns are not enough to improve environmentally sustainable behavior in our communities. The goal of raising awareness is admirable, but it is only a beginning and not an end in itself. If ecological participatory action is considered important then more work needs to be done to promote it.

Community-based monitoring in conjunction with experiential environmental education and can work to improve responsible behavior when used in coordination with a comprehensive education strategy and media campaign. If we do what we have always done, we will get what we have always gotten, so “looking ahead to the 21st century, the task of building a sustainable world order will require dismantling the scaffolding of ideas, philosophies, and ideologies that constitutes the modern curriculum” (Orr, 1999, p.232). It is time to examine and use new tools for teaching in ways that address the ecological and social imperatives being faced as we seek to build a fairer, less troubled and sustainable world for our children (Fien, 2003). The promotion of outdoor education in the context of coordinated environmental education strategies is an interesting technique to improve participatory outcomes and establish improved ecological behavior in our communities.

Notes

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