

## **Encouraging proximal relations: Queensland high school students go to the reef**

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In proceeding of 2006 NZAEE (New Zealand Association for Environmental Education) biennial conference in Auckland, *Turning Point - 'Taka huri haere mai te wa'*, 22 - 25 January 2006

**Abstract:** Over sixty high schools in Queensland run formal marine studies programs in the senior years of schooling. A key component of these programs is experiential learning in marine environments including the Great Barrier Reef. Year 11 and 12 students from four high schools were interviewed during organized trips to offshore coral reef sites. This paper presents selected student accounts of reef educational experiences and identifies reported relations of proximity as a focus for analysis.

The concept of proximity is important to environmental education when one declared aim is a 'rediscovery' of our connections to the world around us. Results indicate that, as a result of their reef experiences, students talk different reef relations into being - positioning reefs as being nearer, less far away, and, therefore, in more need of attention and care. Interview data provide evidence to support the argument that outdoor and underwater learning experiences are a necessary part of education for marine sustainability. The pedagogical intention of the Queensland Studies Authority Marine Studies syllabus, which mandates for fieldwork, is confirmed by qualitative student accounts of their learning experiences.

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Reference as: Stepath, C.M. & Whitehouse, H. (2006). Encouraging proximal relations: Queensland high school students go to the reef. In proceedings of NZAEE (New Zealand Association for Environmental Education) Conference, Turning Point. January 22-25, 2006, at University of Auckland. Auckland: New Zealand Association for Environmental Education.

## **Introduction**

*The good thing about learning here was that we did not have to sit inside. We actually got hands-on experience of the island. I learned a lot about the animals and reef monitoring, about going up and counting everything. I didn't really think with the sea cucumbers, there would be so many. It is a lot better out here. It gets boring in a classroom. I had a really good time. (female 1)*

Proximal: situated towards the centre of the body or point of attachment.

Proximity: nearness in space and time ... kinship (Concise Oxford, 3<sup>rd</sup> edition)

In Rickinson's (2001) extensive review of environmental education research he notes greater attention needs to be paid to investigating students' qualitative learning experiences. Allison and Pomeroy (2000, p.91) emphasise the importance of investigating "the experiences of individuals and the meanings they make of their experiences" in education research. This study qualitatively illuminates senior high school student accounts of environmental learning at offshore coral reefs in Queensland, Australia. The student participants in this study were enrolled in either a Year 11 or Year 12 Marine Studies program at one of four Queensland high schools, two Catholic high schools and two state high schools, in 2002 and 2003.

Notions of interrelations and proximities are important in ecological education when one declared aim of sustainability education is "a rediscovery of our connections to the natural world" (ISOS, 2003). One aim of senior secondary marine education in Queensland as stated in the updated Queensland Studies Authority Marine Studies Syllabus is that "marine studies provides opportunities for students to develop an awareness of the value of the sea and coastal zone necessary for the sustainable management of a healthy marine environment for present and future generations"(QSA 2004, p.3). Marine studies emphasises "first hand experience" (p.1) of marine environments. The new syllabus mandates that a minimum of three full days (18 hours) a year be devoted to fieldwork.

How we experience learning is affected by the places and spaces in which we learn. The Queensland Marine studies syllabus explicitly recognises the pedagogical value of learning outside the confines of the classroom. In order to acquire greater

“knowledge and understanding of the sea, its inhabitants, the coastline and the sea floor” (QSA 2004, p.1) students undertake field study in marine environments. To learn how students are making sense of their outdoor experiences, the education researcher needs to follow them.

The purpose of our data collection was to establish whether field work underwater at coral reefs was of learning value to the students themselves. It is often the case that educators make curriculum and pedagogical decisions based on intuition rather than empirical evidence for student learning. It would be difficult to find a marine educator who didn't feel in their bones (or stomach or heart depending on your preferred metaphor) that taking their students out into a variety of marine environments was 'a good thing'. The mandated fieldwork element of the QSA Marine Studies Syllabus is based on the premise. It makes sense that, in tropical Queensland, marine studies students have underwater reef experiences such as free snorkelling or structured reef monitoring activities. Yet, there have been remarkably few studies, quantitative or qualitative, which empirically confirm that getting wet enhances student learning. We could find no systematic study of the learning value of snorkelling or reef monitoring in the experiential or environmental education literature. Once Carl embarked on the difficult task of *in situ* data collection we realised there was probably a practical reason these studies did not exist.

### **Data collection**

The first obstacle was the ethics application for conducting research with high school students in unpredictable offshore environments. The combined ethics approval application for James Cook University, Education Queensland and the Catholic schools sector in two different dioceses was sixty pages long. The risk analysis alone ran to several pages and included item analysis for irrikanji and box jellyfish stings, sea snake bites, eel bites, shark attack, sunburn, dehydration, strong currents, panic attacks and anything else we could dream up. (We forgot remora attacks, but that is another story). The fact we gained ethics approval at the time remains an achievement still marvelled at by university faculty today. The approval process took eight months.

The second obstacle was the data collection process, which would not have occurred without the full cooperation of the Marine Teachers Association of Queensland, many willing marine studies teachers, teacher aides and the support of school principals. We would like to acknowledge the assistance of all the educators involved who made this project possible.

This paper could be subtitled ‘the difficulties of interviewing adolescents on boats’. Collecting interview data was logistically challenging. Interview data were generated by Carl who accompanied four different field excursions to the Great Barrier Reef Marine Park. As part of the fieldwork, Carl also taught the techniques of coral reef monitoring. Three reef trips were day visits. One trip was of a weeks duration. Students were interviewed immediately after their reef monitoring and free snorkelling experiences. In three of four cases, this meant on the return boat journey home. With one exception, the weather was lousy, with many students experiencing seasickness because of strong winds and high seas. In two cases, the boats were very crowded as the schools used commercial reef trip providers. Most of the 15, 16 and 17 year olds were enthusiastic, but not very expansive, in their conversation with the middle aged, male researcher (Carl). Still and warm conditions on the return trip of High School C proved the most productive for interviewing students.

In the fourth case, Carl interviewed students on the beach at Northwest Island, after an early morning reef monitoring experience on a cold and blustery day when some became chilled. Unpleasant conditions in marine environments are factor when doing this kind of research and some students were understandably unwilling to participate, as they were feeling cold, ill or tired. The entire transcript for one male student consists of the words, *I didn't really like it. I was cold and sick.*

Sixty seven interviews were conducted by Carl. A further fifty one peer interviews were conducted as one means of triangulating these data. Carl thought that if students interviewed each other about their reef experiences, this might get around the adult researcher-adolescent participant effect. The peer interviewers used a copy of Carl's interview schedule so that similar questions were asked in researcher and peer interviews. Not all peer interviews followed the interview schedule precisely.

A surprising fact was the number of students who had never been to the reef before, even though almost all students interviewed for this research live in coastal Queensland towns. The four trips represent the first visit to the Great Barrier Reef for 21.6% of the high school students in the study.

All interviews were audio-taped or video-taped and the tapes transcribed as accurately as possible given background conditions were generally noisy. Despite the many limitations to their collection, these data do represent a unique set of adolescent opinions and statements on the value of reef experiential education collected *in situ*, on boats and on an island beach, in tropical marine environments.

*Table I. Number and percentage of students Interviewed from each high school*

High School	A *	B *	C *	D **	Total
Students on reef trip	52	26	27	55	160
Number of students interviewed by Carl Stepath	11	12	19	25	67
Percentage interviewed by Carl Stepath	21%	46%	70%	45%	42%
Number of students recorded in peer interviews	12	8	17	14	51

Note:

\* indicates a day trip to coral reefs in the Great Barrier Reef Marine Park

\*\* indicates an extended field visit to North West Island

### **Data analysis**

Transcripts of student responses were read and sorted. No data processing program was used to analyse the scripts. Analyses for this paper were conducted twice - first by Carl, who made subjective but consistent judgements of responses to the structured questions according to question topic and then by Hilary who further analysed sorted data looking for concepts of proximity in student accounts where students are able to locate their experiences in space and place. Proximity is defined as attachment,

kinship and nearness in space or time. Proximity as a relationship between learners and marine environments is promoted in the QSA Marine Studies Syllabus as teachers are encouraged to treat marine environments as sites of learning and not just as objects of study.

Central to the analysis is a question posed by Rose (1999, p. 252) who asks, “what kinds of space articulate what kinds of corporealised relation”? On the premise that environmental education research is an investigation of relations and relationships between differing bodies, both social and physical, the research questions concern the sites of learning. The first question addressed in this paper is, how do senior high school students relate their learning within classrooms to their experiences of learning within coral reefs in the context of marine studies pedagogy? The second question is, how do senior high school students come to understand the corpo/realities of coral reefs through their underwater immersion experiences?

### **Student accounts in relation to research questions**

Question 1: How do senior high school students relate their learning within classrooms to their experiences of learning within coral reefs in the context of marine studies pedagogy?

The following transcripts clearly show students recognised the value of escaping the classroom and getting wet in order to learn more acutely about coral reefs. The experienced reef is “a completely different world” from the one that is read about in books or viewed on television or video screens or as represented in “other people’s stories”. Students voluntarily compare learning from texts, such as books and videos, with the reality of encountering reef environments they describe as “hands on” learning. The action component of listening to learn at the reef compares favourably with classroom situations. Every transcript is the account of a different student. Accounts from total of twenty four males and eighteen females are presented in this paper.

*It is just so awesome to get out here and really get hands-on. Being in the classroom, you can only see pictures and hear other people’s stories [of the reef], but it is a*

*completely different world when you experience it. The reef is something you have to see to believe, really. You definitely learn more out here. Like picking up little sea anemones - you can see it on video and watch people do it, but it is completely different when the anemone is in your hand and you are learning from your own experiences. (male 1)*

*The whole ecosystem out on the reef, it is great. Like, you hear about it and see it on TV, when you actually see it; it just means a whole lot more. It can't get much better than this. Hands-on is definitely the way to go. You learn a thousand more things looking at the reef [under water] rather than reading about it. (male 2)*

*Being out here understand a lot more. You actually experience things, whereas in the classroom you are being told about it. You probably learn lot more when you experience it. I learned how to drive the boat. (female 2)*

*I like it out here because you are actually doing it; you are not just sitting down and reading a book about it. I think you learn a lot more. (male 3)*

*This is so much better than the classroom, more hands-on, more fun. I have been camping but I have never been to the Barrier Reef before. (female 3)*

*You learn things out here for sure. It makes it heaps easier to learn if you are actually doing things that you learn, not just sitting there listening to it. (male 4)*

*I like learning this way because it is actual hands-on experience. When you are in the classroom there are too many distractions, your mind just slips. But when you are out here doing stuff you learn a lot better because you are interested. (male 5)*

*It gives you the opportunity to see things first hands-on instead of reading out of a book. And people learn a lot more because they are interested. (female 4)*

*Actually, coming out here and experiencing the reef helps us learn better ... like much better than reading books. It is right in your face so you can't really have any excuses. (male 6)*

*I wouldn't classify this as education because it is just too much fun, but if it has to be called education, then it is great. In a classroom, there a book is put in front of you and you are made to read it, but here you listen to everything because you want to, you want to know everything. (male 7)*

*It is so different to normal life, it is excellent. It is so much more interesting than the classroom. To be able to look at [the reef] was so good. (female 5)*

*I haven't learned so much in a week in my life to be honest. You still learn theory, but it is all based on practice, all the work is based on something that you have done on that day. You learn things out here for sure. It makes it heaps easier to learn if you are actually doing things that you learn, not just sitting there listening to it. (male 8)*

*It is better than in school ... I look more in the field. Everyone knows that compared to a classroom, if you are in the field you can be in touch with what you are talking about. You can learn a lot more about it. We should do more field research. (male 9)*

*You learn so much out here. It is hands-on. I think it is a great experience. I would come back if I had a chance. (male 10 )*

*Thumbs up, top trip- I wish this was school everyday. (male 11).*

Question 2: How do senior high school students come to understand the corpo/realities of coral reefs through their underwater immersion experiences?

Data show that conceived relations between students and reef bodies do change as reefs become familiar places for students through field visits. The animal and plant bodies that create reefs become comprehensible and the realities of reef preservation become better understood. Students speak of not realising how many different species

of fish inhabit reefs, of encounters with corals, sea cucumbers, clams and how “lovely” it is to “get to see the reef”. Their accounts make apparent what they have learned about the effects humans have on coral reefs – a positive educational outcome given an aim of the QSA Marine Studies Syllabus is to encourage students to reflect on their own values and attitudes towards marine environments. Overwhelmingly, the impression from student accounts is of the value of field trip experiences that provide contact with reef bodies. As well as having fun and rating snorkelling and reef monitoring as “pretty good”, students can immediately make the connections to a variety of reef conservation issues immediately following their underwater encounters. The following represents the accounts of different students.

*I never knew an island could be made from a coral reef. You realise we need coral reefs. We have to keep coral reefs safe and safe for our children. I am a lot more interested in actual reefs now and in reef animals. (male 12)*

*I know the difference between certain corals and fish, and what is poisonous and what is not harmful (female 6)*

*You learn there is stuff out here that you never really knew what it was before. (male 13)*

*[I] liked the fact that we are able to come out here and have a swim and learn about the reef. It is lovely to get to see the reef, learn a bit. (male 14)*

*I have learned about the diversity of fish down there, there is so much to see and that was cool. (female 7)*

*I liked learning about the fish. I didn't know what the fish were before. (female 8)*

*It makes us know what the reef is like and how we need to keep it in good condition so our kids can enjoy it like we do. (male 15)*

*I have never seen a coral reef before. I have never seen so much coral. We learned about all the different types of coral and fish. I quite liked looking at the butterfly fish and coral cod; it was quite interesting. (male 16)*

*People learn more when it is hands-on instead of just reading about things that you forget easily. When you are in a classroom, you only see pictures, but we have actually seen the creatures, and been able to pick them up, and actually hold them, and we are not going to forget that. (female 9)*

*I loved the beach just lying out there and looking at the coral and fish. We saw some eagle rays and blue spotted rays and stingrays. You just see everything from a different angle. I learned how much we destroy everything and I learned how to help a coral reef rather than destroy it. Everyone is interested and they want to do it [participate] rather than in a classroom, which is just boring. It's up on the board and you're not doing anything and people just bludge. But here [on the reef], you want to do it because it is fun. (female 10)*

*I thought it was very educational and I learned stuff I didn't know before and that can help me and I can go and tell other people, just basic knowledge about the reef and different fish, different types of coral and everything like that. Whenever the conversation comes up, I will know a bit more than my share. (male 17)*

*The reef monitoring was pretty good except it was choppy the day we went out and a bit scary. I was worried about drifting away. I learned that sea cucumbers have this thing on the outside that maybe helps breast cancer, I learned about coral cays. I've learned heaps. (female 11)*

*I liked getting to have close up encounters with the native wildlife of the Great Barrier Reef. It was pretty interesting to do those surveys on the spot and see which creatures inhabit the reef. I learned the names of different fish that we saw and now when I go fishing, I will know what it is. (male 18)*

*It helps me respect what we have got out here. (female 12)*

*It makes you more conservative, and aware of what is going on in the world. And you tend to appreciate the reef more. It has changed a lot of stuff for me. (female 13)*

*People don't understand that coral is fragile and it can get screwed up pretty easily. They stand all over the coral, and they think 'that's a nice bit of coral' and pick it up, rip it out, which kills it, and they don't really take notice because they think it's unlimited. But it can die pretty easily and it takes a pretty long time for it to grow back. (male 19)*

*Bring more people out and let them have a look at the reef and see how wonderful it is. Let them see for themselves and they probably won't be so destructive to it. Like they throw stuff out of the boat and they don't think about the damage they are doing. (male 20)*

*It's great to see people coming out here enjoying the reef but thousands upon thousands of people are coming here and walking across the reef, would be ultimately bad for the reef. (male 21)*

*We all live here so we should know things about the reef. (female 14).*

*I liked going into the water because you could see all the stuff above the water and the coral underneath. I saw a bit of litter out there that I had to pick up, like beer bottles, quite a lot of them, [and] bits of plastic and plastic bags that I pulled off the coral as I was doing the monitoring. (male 22)*

*Yesterday I did coral reef monitoring with my friend Carl here, and what I really liked was when Carl took a photo of me under the water. And straight after that, I did a dive on the other side of the island, which not many people do, and it was beautiful. I learned not to put my fingers into clams and not to play with sea cucumbers for too long. (female 15)*

*Don't put your anchors on the reef, because that will wreck it, because they're alive, they're living animals. (female 16)*

*I learned to treat the coral and the reef and ocean very carefully and the marine life out here is very fragile, just the smallest influence can be detrimental to it. (male 23)*

*I was a bit careless about the environment before I came out here. I was a bit of a litterer I guess. (female 17)*

*This experience makes me more conscious of how to treat the ocean and the reef, like stop polluting and stuff. (female 18)*

*I am definitely going to come back again, I love it. (male 23)*

*Marine studies is like a retreat, like getting to know yourself, how well you cope in certain situations and you learn about your friends and how well they cope with the same situations as well. I have also learned how to preserve the reef a bit more (male 24)*

## **Conclusion**

Our intention in writing this paper was to give as much space as possible to student accounts of their learning experiences. Consequently, we have kept our own analysis to a minimum. Field trips do give students proximal experiences of reef environments. When asked directly to describe their experiences, students talked about the value of a “hands-on”, active approach to developing their understanding of coral reef diversity and their appreciation for the importance of coral reefs. Student accounts show they develop a concrete understanding of coral reefs in the Great Barrier Reef Marine Park as knowable places that are in need of conservation. As one male, student told Carl, *you need to get more students out here to learn how to protect the reef.*

Underwater experiences of coral reefs change what Probyn (2003) calls “relations of proximity” that “highlight the facts of connection and dis/connection” (p. 298). Reefs are physically located offshore and underwater. From land, reefs can be conceived as

far away. Students accounts are unequivocal - learning about reefs in the classroom from books, video and teacher talk is quite different to learning within reefs. Organised marine studies field trips that include reef walks, snorkelling and reef monitoring activities bring students into direct contact with the myriad living bodies creating a reef. The result of which is what Rose (1999, p. 252) terms “the space of relation”, an imaginably conceived space between differing bodies, does change for many of the student learners in this study. Students speak of “being more connected” to and becoming “more familiar” with coral reefs. As one student remarked, *I will always remember everything here.*

This study represents an original contribution to marine education research in presenting senior high-school student accounts of their learning experiences in the Great Barrier Reef Marine Park. These qualitative data do confirm the pedagogical intent of the Queensland Studies Authority Marine Studies syllabus that mandates field experiences as a necessary part of curriculum. This research provides evidence that experiential learning in coral reefs is considered of value by the students themselves and senior Marine Studies field work should continue to be supported by schools and education systems in Queensland.

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