

Supplementary Information

Appendix S1. Study participant information

In total, 48 students, three kaiako (teachers), and one regional poutautoko (environmental liaison support from the Te Aho Tū Roa programme) participated in a mix of wānanga and classroom sessions: 22 tauira (students), two kaiako (Teachers), and one regional poutautoko (environmental liaison) at TWoM; and 26 tauira and one kaiako at TWoR. The tauira were between 11 and 15 years of age, and 80% identified themselves as being of Māori descent, 19% identified as Pākehā (European heritage), and 1% as Pasifika (Rarotonga and Tongan).

Te Wharekura o Maniapoto

Students spent time in a 3-day noho wānanga, at Otawhiwhi

Marae in Bowentown, Bay of Plenty in addition to having three school-based workshops. The noho wānanga involved two field trips. All activities during the noho involved the 22 tauira, two kaiako, two regional poutautoko, and eight whānau members, and were facilitated by Māori subject experts. Field trip activities are identified in the table 1.

Activities for the marine and forest environments. For the marine field trip, the students were divided into groups of approx. 6 and rotated to each activity.

The experts who delivered the program were a traditional Māori medicine, three marine biologists, an environmental researcher, and a freshwater wetland ecologist.

Table 1. Field trip activities. Each fieldtrip was immediately followed by an interactive session to workshop values and understandings learnt while visiting the different environments.

Habitat	Activity
Moana (Marine)	Boat trip around harbour and to pipi (<i>Paphies australis</i>) beds Invertebrate identification using bi-lingual marine guide Pest species identification guide and crab nets to demonstrate catch methods Snorkelling to experience the local marine life and habitat Star compass (Matariki) to introduce Māori navigational knowledge, constellations, star clusters and names
Ngahere (Forest)	Kauri (<i>Agathis australis</i>) die back cleaning station, learning about the disease, then walked to Tuahu Kauri tree Introducing concepts of Maori rongoā (medicine) and kai (food)

Te Wharekura o Rakaumanga

Tauira had three kura-based sessions, each held over a single timetable block (120 minutes). The first workshop was focused on the local awa (river) Waikato but had no associated field trip. The purpose of the interactive session was to connect the students by drawing on their existing connection to the awa to illuminate their understanding, values, and concepts in relating to the awa.

A second session had the students explore the wetlands on the school's boundary. The field trip involved 26 tauira and one kaiako and was facilitated by the project researchers. The classroom sessions were facilitated by the research team and were designed to gauge students understanding of ecological interrelationships, and the values they placed on these ecosystems. Students from both schools were issued with smartphones and tablets during the scheduled sessions to document their perspective of the project.

Appendix S2. Examples of ORID focused conversation questions asked to student to stimulate feedback about the moana

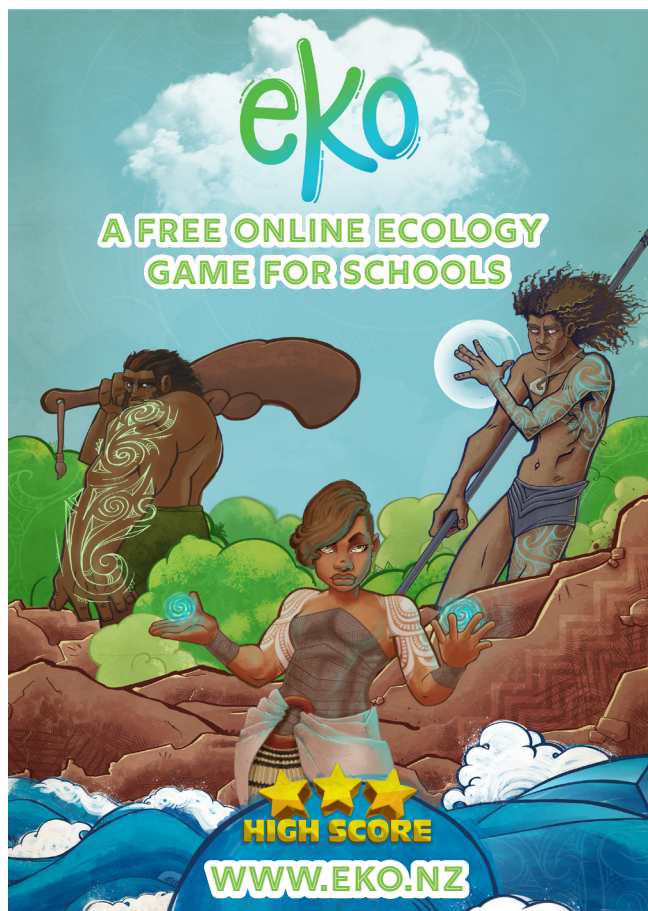
Strategic question category	Example from interactive sessions
Objective	What did you enjoy about the moana? What did the moana look like? What did you learn about your moana?
Reflective	What feelings do you have being by the moana?
Interpretive	How healthy do you think the moana is? What are the signs that the moana is healthy or unhealthy?
Decisional	Can you think of ways to make the moana healthier?

Appendix S3. App design survey

Questions	Answer options
Q1 – How often do you use mobile applications?	Daily, weekly, monthly, not at all.
Q2 – What applications do you use?	
Q3 – Why do you use the mobile applications you have mentioned?	
Q4 – Do you play gaming apps?	
Q5 – What do you like about the applications you use?	Keep in touch with family, to play games, to learn something new?
Q6 – What features do you like the most?	Taking photos, click to send, swipe to send, swipe to move to next page, automatic switch to next page?
Q7– What features do you like the least?	Updates, no wifi, swipe to send, click to send?
Q8 – How did you find the questions in the trial game?	Hard, ok, easy.
Q9 – How did you find the game?	Awesome, ok, bad.
Q10 – If you ticked bad, can you tell us what you thought was bad about it?	
Q11 – Any other comments you would like to make?	

Appendix S4. Eko game survey

Questions	Answer options
Q1 – Overall how entertaining was the game?	1 = Boring to 10 = Fantastic
Q2 – How easy was the game?	1 = Easy to 10 = Very hard
Q3 – Did you learn anything from the game?	1 = Not at all to 10 = Definitely
Q4 – Do you want to keep playing the game?	Yes, maybe, no
Q5 – How many species can you recall?	
Q6 – What did you like most about the game?	
Q7 – What did you like least about the game?	
Q8 – Any final comments?	



Appendix S5. Eko game poster