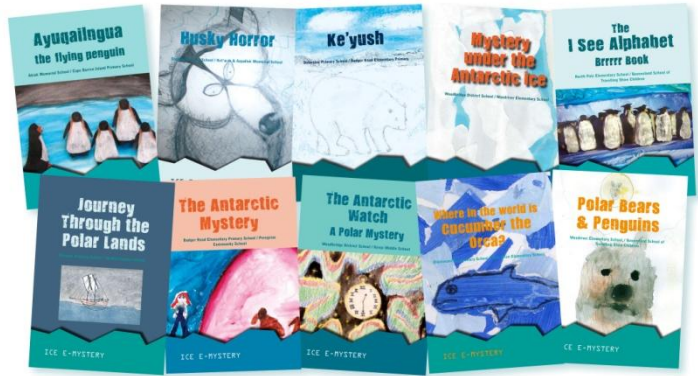


ICE E-MYSTERY: Global student Polar e-books

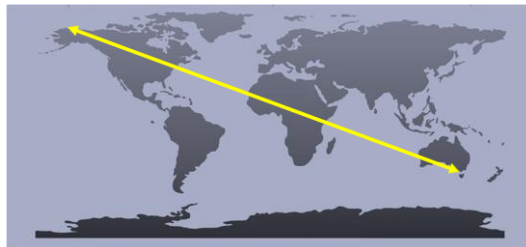
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Tasmanian Museum and Art Gallery
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Introduction

The Ice e-Mystery Project explored polar science through an innovative approach to science, art and literacy education. The project involved students from throughout Australia and North America working together (paired classes across the hemispheres) to write and illustrate on-line e-books in a mystery genre focused around the themes of polar science. Primary aged school students were guided by; post graduate students trained in Antarctic science, classroom teachers trained in the project methodology and polar sciences, and resources provided by national research organisations such as the Australian Antarctic Division, Commonwealth Scientific and Industry Research Organisation (CSIRO, the Tasmanian and Museum and Art Gallery, the Universities of Tasmania and Alaska and Antarctic related Cooperative Research Centres.



Project Website <http://iem.tmag.tas.gov.au>



What were the aims of Ice e-mystery?

To engage more students in deeply understanding the polar regions and developing interdisciplinary skills in science, art and literacy as well as foster a culture of collaboration and environmental awareness. The project aimed to develop an international learning community of school students, teachers, postgraduate students and scientists. Innovative aspects of this project included the use of new web open-journal software for the collaborative work and the framing of possible narratives and the broad scope of institutions and disciplines involved.

Impact, achievements and sustainability

- Establishment of an ongoing international community of learners around Polar science; communication across the 24 teachers, approximately 320 students, 3 teacher associates, 5 global educators, 2 Antarctic children's authors/ illustrators and the numerous scientists was achieved with outstanding success. A complex web of interactions occurred based around emails, Skype calls, the Ice e-mystery (IEM) website and personal visits.
- Engagement in an interdisciplinary project that combined science, literacy and art in an educationally-sound project with increased teaching skills in all these areas.

"It was one of those lasting memories for my students."

- Production of 10 illustrated fiction books, with accurate polar science threaded into them, authored collaboratively by students from paired classes across the globe.
- Real contact for students and teacher with polar objects and people through visits to the Tasmanian Museum and Art Gallery (TMAG) Antarctic Exhibition, the Australian Antarctic Division (AAD) and other science venues and with polar scientists.
- In depth training in polar science for 24 teachers through two comprehensive workshops run in Tasmania and Alaska by specialist educators, artists and polar scientists.
- Cultural exchange between indigenous students from remote regions, especially Western Alaska and Cape Barren Island and Western Tasmania.
- Creation of a web platform for both the development and dissemination of the e-books.
- A methodology for collaborative writing using ICT.
- The project secured additional funding to evaluate the methodology used and further train Alaskan teachers in polar science through a visit to Tasmania.
- Presentations on the project have occurred in conferences in Perth, Melbourne, (Australia), Orlando, (Florida) and Oslo, (Norway).
- Extensive media coverage.
- An increase in student motivation, self-directedness, and subject knowledge during and after their active participation with creating the e-books.

"It was so open-ended. It took on a life of its own. The kids felt very empowered and their research was driven by the need to know - not by a plan that I put in place."

Who were the participants and learners?

The student participants were from 8 Australian and Alaskan schools ranging from grade 2 (6 year olds) to grade 8 (13 year olds). Most were grade 4-6. Schools were selected with regard to remoteness, lack of access to resources and expertise, presence of indigenous students and interest in the project. 7 of the Australian schools were Tasmanian, including Cape Barren Island in Bass Strait; the remaining Australian school was a travelling school comprising students from families that work the Agricultural Fairgrounds across 64 locations on the eastern seaboard. The Alaskan schools include several from the remote western tundra region, through primarily they came from the region around Fairbanks.

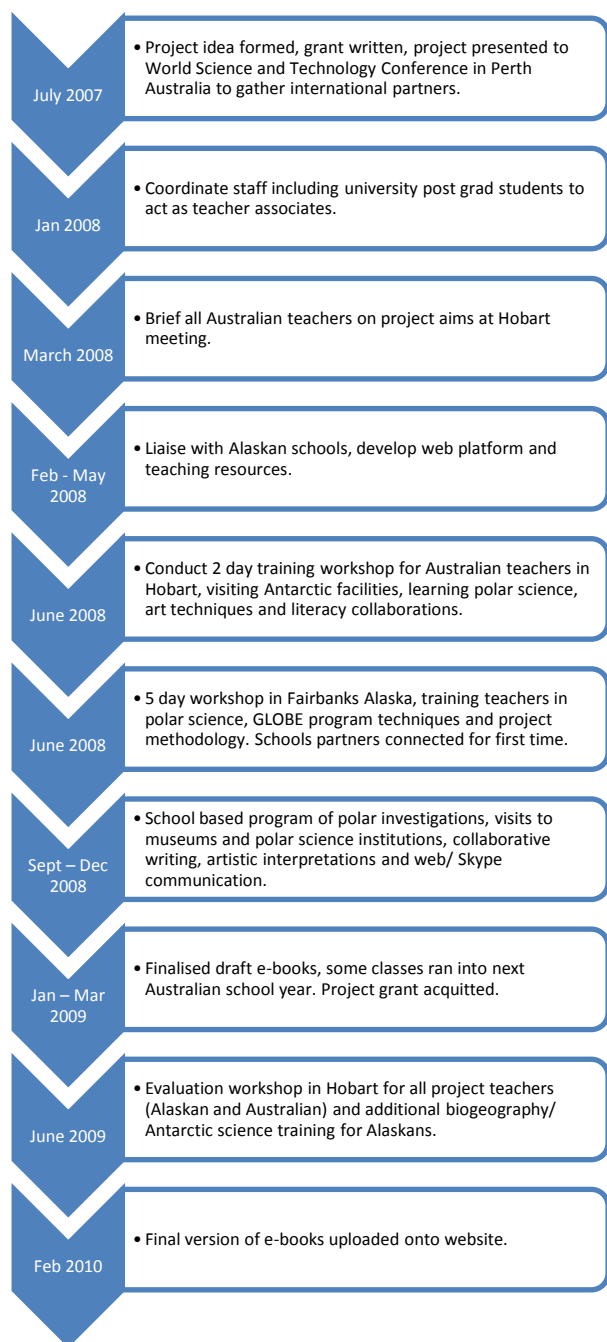
The educators and scientists were drawn from a vast resource in Hobart and Fairbanks, two areas where polar

The Vital Statistics	
Total Cost	AUS\$ 125 000 excluding teaching time and permanent science/ university/ museum staff time
Total Number of Participants	320 students, 24 teachers, numerous educators and scientists + communities
Number of Partners	24
Partner organizations	Tasmanian Museum and Art Gallery
	Australian Schools Innovations in Science Technology and Mathematics - Government Grants body
	National Science Foundation, USA
	Antarctic Climate and Ecosystem Cooperative Research Centre (ACECRC)
	Australian Government Antarctic Division (AAD)
	University of Tasmania
	Institute of Antarctic and Southern Ocean Studies, (IASOS)
	University of Alaska, Fairbanks
Australian Schools	Mt Faulkner Primary School, Tasmania
	Cape Barren Island Primary School, Tasmania
	Deloraine Primary School, Tasmania
	Woodbridge School, Tasmania
	Margate Primary School, Tasmania
	Peregrine, Tasmania
	Queensland School for Travelling Show Children
	Strahan Primary School, Tasmania
Alaskan schools (USA)	Akiuk Memorial School
	McNeil Canyon School
	Badger Road Elementary School, North Pole
	Ket'acik & Aapalluk Memorial School
	Kenai Middle School
	Nordale Elementary School,
	Anne Wien Elementary School,
	Woodriver Elementary School,
	Communities of all schools, including parents, local community members and media

science is strong. Originally the project looked at more widespread collaborations but the logistics of this were too ambitious. English language was the medium.



One notable unexpected group of ‘participants’ were the communities of several small regional towns of participating schools. The mystery frame up activity was taken ‘almost too far’ to quote one teacher with the mystery of a missing emperor penguin egg engaging the local police, the local Parks and Wildlife Officer, the school principal (who were all ‘in’ on the set up) and many concerned parents and siblings (who weren’t!). The ‘object’ in museum parlance really took on a story of its own... the eggs were props made by the Tasmanian Museum preparator and provided to all the classes.



How they did it

The project was run over two years from writing grants to publishing e-books. The timeframe

“I thought the whole project was very creative in design and amazing how it incorporated so many areas from science content to writing and research skills, to teacher and student collaborating [sic] across the hemispheres...What an ambitious and rich idea! It was a big success! “

was extended due to difficulties in matching school years across the hemispheres and finalizing the e-book graphic designs.

Phase one included finding school and science institutional partners, developing the resources for teachers, including the web platforms for the communication and writing, and training teachers in both Tasmania and Alaska. Additional resources were secured through the National Science Foundation grant to evaluate the project. The collaborative writing methodology was based on, and extended from, the successful project *The Hidden Secrets of Skull Island* (a joint project of James Cook University and the University of Queensland Bright Minds Program), coordinated by Sandra Zicus.

Phase two was the in-class activities, including visits from the teacher associates (post grad. polar science students), visits to museums and setting up the ‘mystery’ to initiate the writing narrative. Early collaboration between global paired classes involved students learning about each others’ environment

and culture. Numerous science experiments were conducted by students in the classrooms in this phase.

Phase three was the collaboration between the classes across the globe, with the writing, illustration and incorporation of the science they had learnt. Facts were checked by scientists, mostly by email. Several classes presented the project to whole school assemblies and a couple printed their versions of the e-books, prior to the professionally edited and graphically designed versions going online.

What were the challenges?

There were three main areas where we could have improved. First the matching of the school years between the two countries provided a very narrow window to bring together the teachers and students, making things rushed. Secondly the technology for the web communication was too complex for many of the teachers, causing stress with the new skills needed to navigate the web platform. Also the data speeds of many locations didn't allow for full use of video Skype which meant that communication was frustrating at times. And thirdly the coordination of the project was really a full time task, but was only a small part of the project coordinator's substantive role in the Tasmanian Museum and Art Gallery. All these had ramifications in maintaining the project momentum after the school year had finished, delaying the compilation of final texts and uploading of the finished edited and graphically designed e-books. Many of these issues were because the project was trying something unique for the individuals concerned, which involved considerable risk but ultimately was why everyone chose to engage in the first place! Other issues included significant illness with one teacher whose subsequent replacement had not attended the briefings/training, and some schools feeling their partners weren't pulling their weight in the collaborative aspects.

Would you like to participate in future collaborative projects? "Yes! The kids didn't want to let this one go."

What would we do differently?

- Resource the Coordination better (more time), keep the momentum going by completing within the school year and more tightly guide and engage teachers with twitter updates/reminders. Educators need to co-construct a timeline for monitoring progress.
- Develop a simpler web platform using more standard blog technology. The Wordpress model proved cumbersome for uploading graphics. Also program designers were new to the technology, which has developed considerably since the project's inception in 2007.
- Timetable better. Time ran out; different school calendar years and conflicting class programs caused stress with project completion deadlines.



Student artwork from e-book 'Polar Bears &



Cape Barren Island (CBI) Primary students 'Racing for the South Pole'

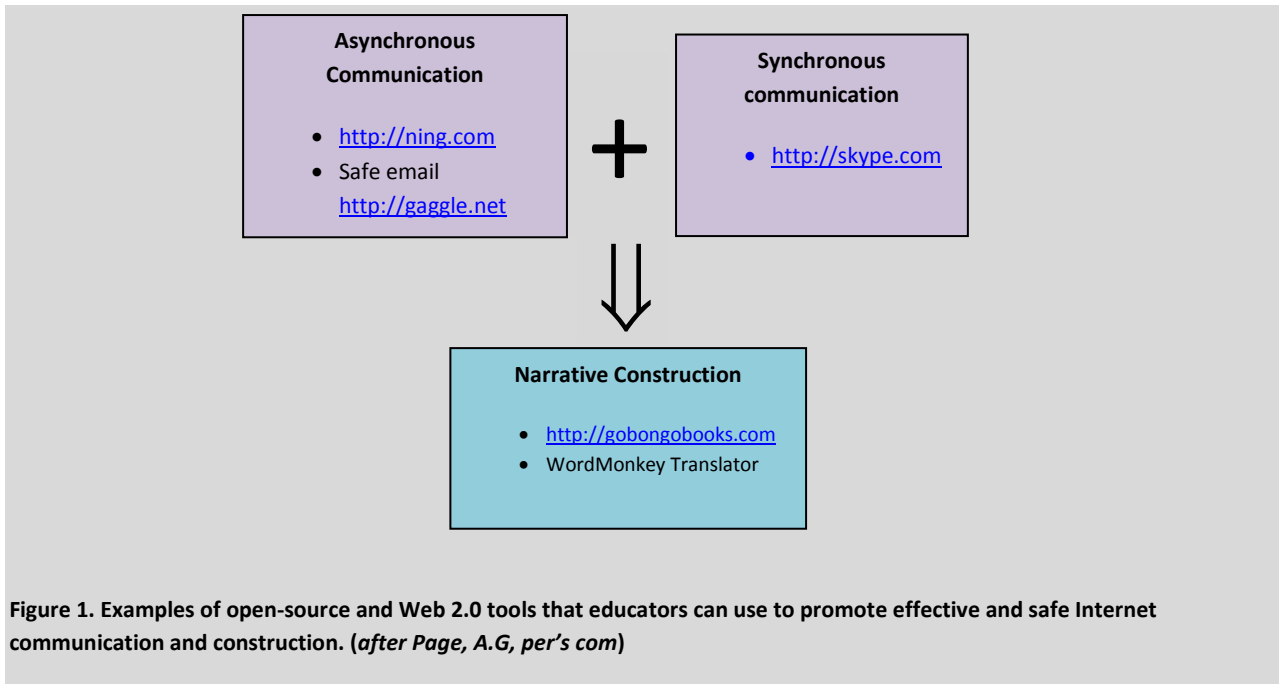


Figure 1. Examples of open-source and Web 2.0 tools that educators can use to promote effective and safe Internet communication and construction. (after Page, A.G, per's com)

Features

CBI students and the mystery egg.



The Frame Up

Engaging students in the wonder of learning was a key intention of the frame up of writing a mystery genre around an Antarctic theme. Each school was provided with the outline

of the frame up idea, a life sized replica of an Emperor penguin egg, templates for 'fake' documents provided by the Tasmanian Museum and Art Gallery and the 'London Natural History Museum', photos of



real eggs in the TMAG collection and information about Apsley Cherry-

Garrard's *Worst Journey in the World*. The scenarios differed slightly with each class but the basic premise was that students were led to believe that a special egg they had in the school went missing after a few days, and they had to explore the setting, characters, clues, climax, coda,

resolution, alibis and motives.

"The mystery "frame up" was extremely successful! Actually, it almost got out of hand. We included many people in our "conspiracy" to create the mystery of the missing egg. Our principal, assistant principal, the art specialist, a local police officer, and the cooperation of all our staff convinced the entire student body the "priceless" Emperor penguin egg from the London Museum was stolen. We actually got some calls from the community concerned about what was happening at the school! This part of the "plan" went incredibly well and really motivated the students to get into writing their own mystery."

Teacher Training

"Lots of the teachers who attended the workshops last week said that they were the best professional development they had ever attended"

This was a major investment of the project: a two day workshop in Hobart, a 5 day one in Fairbanks and a combined one for all teachers

in Hobart at the conclusion of the project. Training included polar sciences, art skills, collaborative writing methods and using the web platform for the student writing. Field trips, visiting artists and scientists and close encounters with museum objects all made for a valuable learning experience for the teachers involved.



Teachers learning CO₂ experiments

Breaking new ground – willing to risk it

There was no research published on collaborative project-based learning between *two or more classrooms at different geographical locations* using information and communication technology as a means to construct knowledge. Lou and MacGregor (2004) found that the using computer-supported collaborative process of project-based learning between groups and within groups noting “Providing feedback to each other across groups helps students to develop critical thinking skills, self-regulating skills, as well as skills in evaluating the work of others” (p.437). They go on to state that the process of collaboration “enhances the transfer between conceptual understanding and applying newly learned concepts in their own projects and in evaluating other projects” (p.437).

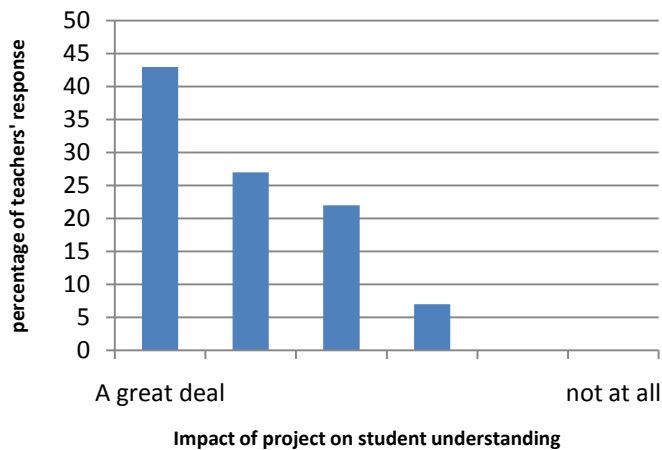
Similarly, “Technology collaborations provide ways to heighten student learning by exposing the educator /student to new content and technology, real world experiences, career guidance and community resources” (Chen, Benton, Cicatelli & Yee, 2004, p.47).



Students with Wandering albatross at the Tasmanian Museum and Art Gallery

“My students really loved the couple of times that they were able to see other students when we hooked up the video. More time with students interacting online would be good, we got in such a hurry at the end it was hard to have as much collaboration as we wanted.”

Student knowledge about Polar Science



“My perception is that they went from very little knowledge (of Antarctica, in particular) to increased awareness of the terrain, animals, research, and the threat of global warming.”

Figure 2. Shows teacher's rating of the impact of the Ice e-Mysteries project and the student understanding of Polar Regions and polar science

Summary of teachers' collective responses about the project during SWOT analysis, June 2008

Strengths	Weaknesses	Opportunities	Threats
<p>Collaboration & Connections Interactive global connection, International collaboration, expanded perspective, community.</p> <p>Motivation Exchange of views, opinions, culture, integrated curriculum, art, science, geography.</p> <p>Educational value, Relevance, Increased scientific literacy about polar regions.</p>	<p>Technology Problems with technology, website platform.</p> <p>Time Not enough time, timing and calendar, no closure.</p> <p>Limited choice Mystery genre was too restrictive.</p>	<p>Continuity Ongoing collaboration, continue to enrich and inspire, Continue with the GLOBE project.</p> <p>Wider dissemination</p> <p>Expansion of the concept and project</p>	<p>Funding</p> <p>Support of ed. Policy makers</p> <p>Mandated curriculum pressures</p> <p>Stress</p>

References:

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Chen, L. L. Benton, B. Cocatelli, E., & Yee, L. (2004). Designing and implementing technology collaboration projects: Lessons learned. *TechTrends* 48(3) 46-51.

Lou, Y. & MacGregor, S. K. (2004). Enhancing project-based learning through online between-group collaboration. *Educational Research and Evaluation* 10 (4) 419-440.

Ritchie, S. (Ed) (2004). *The Hidden Secrets of Skull Island*. School of Education, James Cook University. (Coordinated by Zicus, S.)

"I find that the opportunity to work with others is a big plus for my students and I. They are far more motivated to be involved in written work and in finding out about other people, where they live and how they live. I have noticed that they are much more ready to collect information from the news, current affair programmes, the newspaper etc. when there is a mention of Alaska or Antarctica.

"Speaking with the other class is excellent. It is hard to work through ideas but the chance to communicate our growing story with others gives the kids a real boost. It makes the writing personal and they don't usually like writing. We have one person whose job it is to check for replies. He loves doing this. He is normally a quiet person but when there is a comment he can't wait to share it."



Sign at Barrow, Alaska connecting the poles

"The topic and the contact with other students and experts really helped us delve into research, science, and writing about the polar regions. They learned a lot about cooperating with others including themselves at this location. They were motivated by the purposeful learning and publishing nature of the work."

"This project really opened up the possibilities of working with people all over the globe. I know my students really enjoyed it and I did as well. It really gets the thoughts spinning about future projects and international collaboration."

Project Website

<http://iem.tmag.tas.gov.au>



Margate Primary School students with letter to their Alaskan buddies

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All boxed quotes are from teacher responses via a SurveyMonkey online survey



AUSTRALIAN EDUCATION, OUTREACH AND COMMUNICATION COMMITTEE

