

Macquarie ICT Innovations Centre



Local Ecostudy Project 4.0

Project Report 2011

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Macquarie ICT Innovations Centre is a collaboration between the NSW Department of Education and Communities and Macquarie University

About this report

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Schools involved

Iteration 4

Cherrybrook Technology High School
John Purchase Public School

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Executive Summary

About the Centre

The Macquarie ICT Innovations Centre (MacICT) is located at Macquarie University, Sydney, Australia. It is a collaborative agreement between Macquarie University and the NSW Department of Education and Communities (NSWDEC). The centre provides the opportunity for all K-12 schools to access innovative technologies in teaching and learning.

The Centre's focus reflects an innovative project-based approach to working with K-12 teachers and their students. The Centre's core business includes a comprehensive teacher professional learning and support program. MacICT staff, academic research partners from Macquarie University and school teachers collaboratively develop projects that utilise the most innovative, emerging technologies in education.

MacICT is also able to develop and implement small proof of concept projects to evaluate the use of new technologies quickly, providing feedback to our partners about the resource demands of scalability, for example.

MacICT is also able to connect and collaborate with other educational institutions and industry partners to inform the education community and provide significant research knowledge about the capacity of new technologies to enhance student learning.

Mission Statement

'to develop, implement and evaluate innovative ways of enhancing learning through the application of dynamic and emerging information and communication technologies'

To find out more please visit our website at www.macict.edu.au and our blog at <http://web2.macquarieict.schools.nsw.edu.au>

Industry Partners





Project Rationale

The Local Ecostudy Project (LEP) at Macquarie ICT Innovations Centre understands that students learn differently to past generations. Teachers are responding to the needs of this generation of e-learners by incorporating innovative and creative uses of ICT into their teaching practice. The LEP focuses on student-directed learning using mobile devices. It aims to develop and evaluate innovative educational applications of mobile learning technologies, focusing specifically on activities that involve science inquiry in the natural environment. These activities are intended to provide students with curriculum-centred learning opportunities that involve learning outside the four walls of the classroom. The shift in focus from teacher-led to more student-led pedagogies requires a sustained commitment from teachers, students and researchers working within the school system and with local communities to identify and focus on continuing progress towards a shared outcome.

The LEP has an academic partner and deploys an evidence-based approach to project development using cycles of action and reflection to research the impact of mobile technologies on the quality of student learning.

Over the four years of the LEP, the MacICT team has developed considerable expertise in using mobile pedagogies and mobile technologies to support high quality student learning in environments beyond the classroom.

The LEP has incorporated the TPACK framework (*Fig 1*) to structure its approach to mobile learning. Mobile devices deployed in the LEP include iPhones, iPads, NOVA 5000, digital cameras and student DEC issued notebooks. Together with MELCOE (Macquarie E-Learning Centre of Excellence), the LEP developed a location-aware web-application (i.e. MAPPO) and also funded a secure photograph transfer and storage iPhone application. An on-line self-guided version of the LEP has been developed to support schools located in regions beyond North Sydney. The project also utilises open source software including LAMS, LessonLAMS, collaborative blogs, wikis and augmented reality using QR codes and ARIS (Augmented Reality Interactive Storytelling).

NSW DEC State Priority Area: Connected Learning, Teacher Quality, Student Engagement

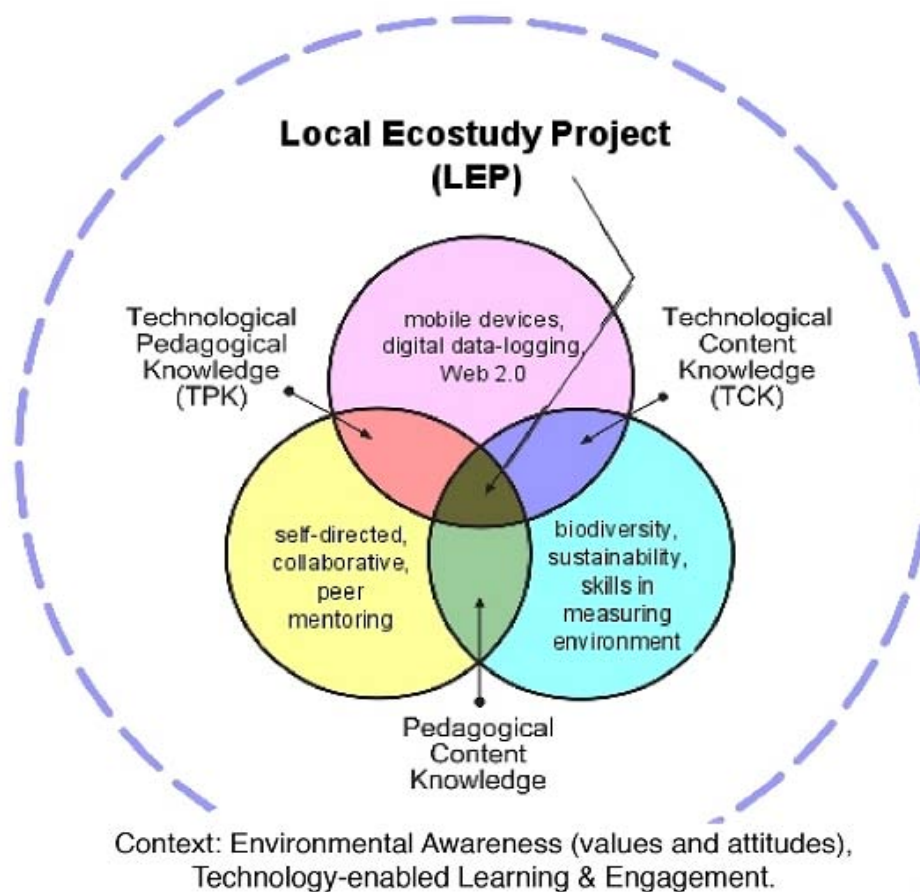
NSR Priority Area: To foster and lead differentiated learning

NSR Strategy: Middle Years Strategy, 15-19 Years

Syllabus Addressed: Science



Fig 1. Local Ecostudy Project Framework (adapted from Mishra & Khloer, 2006)





Strategic Focus

This project links to:

- MacICT Strategic Plan 2011 in elements 1.3, 1.5, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.1, 4.2, 4.3, 4.4, 4.5 (See Appendix A: Links to MacICT Strategic Plan)
- North Sydney Regional Plan – Differentiated Learning Program: Student Leadership (See Appendix B: Links to North Sydney Region Plan)
- Quality Teaching Framework (DET 2003) in elements 1.1, 2.6, 3.5 (See Appendix C: Quality Teaching Framework)

Conclusions from 2010

The ratio of high school mentors to primary students presented an issue in 2010. It was difficult to have the ideal group size of two high school students to two primary school students due to school equality issues. The schools valued the sense of community that the project generated and the innovative use of the technologies was enjoyed by all. As teacher ownership of the project remains a problem, this will be addressed in 2011 by having just one high school teacher more highly engaged and involved. This will allow the teacher to more successfully guide their high school students to develop learning activity sequences at school.

It was found that participating students enjoyed using the technology, particularly the iPhones, during their field work. It was noted that the larger screen of the iPads compared to the iPhones makes mentoring more practical and encourages students to share with others in their group. However, iPads in 2010 were unable to take photos or access QR codes. The Nova 5000s were less inspiring for the students, partly due to the dimly lit screen and poor battery life. However, until data logging capability is possible with the iPhones or iPads the Nova 5000 computers will be required.

New technologies and strategies including the use of QR codes and gamification were trialled with two high schools in term four 2010 resulting in positive feedback from the students.

The team presented at numerous conferences and gave workshops during the year, including Apple ITSC 2010 and Office of Schools. These generated interest but participation from DEC high schools willing to purchase mobile technologies and use them in teaching remains an issue.

Implications for 2011

Based on the experiences of students and teachers involved in 2010, the project team's observations and reflections it was planned that certain aspects of the project would be modified for 2011.



Schools across four regions (Northern Sydney, South-Western Sydney, South Coast-Illawarra and Riverina) have engaged in previous iterations of the LEP. Links to the K-6 syllabus have always been explicitly outlined. However, the links to the 7-12 syllabus documents have historically been somewhat limited and strongly dependent on the commitment level of the high school teachers involved. Iteration 4 focuses on rectifying this trend with the Year 11 science students being the creators and designers of the mobile lessons.

Project Objective

Mobile technologies, mobile mentors, mobile learners. The LEP in 2011 was designed to build technology-dynamic, science and environmentally literate students capable of designing contemporary mobile learning activities. This was to be achieved through the use of mobile technologies to support student mentoring, outdoor learning and access to online open-source science resources in the field.

The project team's previous research demonstrated that high school students exhibit outstanding mentoring skills as they work outdoors with primary students. In 2010 the project facilitated these multi-age groups of students to conduct fieldwork with a potential to make a meaningful contribution to community biodiversity monitoring. In 2011 the project continued this but aimed to further increase

the engagement of the high school students by enabling them to do their own designing, developing and teaching of lessons.

The project this year worked to build more student-directed, less teacher-dominated pedagogies where the role of teacher was to facilitate, encourage, negotiate and support. The role of mentoring students was to design lessons, guide, instruct and assist younger learners using pedagogies that capitalize on the rich and opportunistic learning potential of the local area.

Hardware used this year included iPhones, iPads, Nova 5000s, data-logging sensors, digital cameras and DEC issued student notebooks. Software included Learning Activity Management System (LessonLAMS), QR codes and i-nigma (a QR scanning Application used on iPhones). Other technologies included video conferencing and a social networking tool (Edmodo) enabling the team to support students and teachers in instruction, collaboration, and communication across time and location.

This year the project team experimented with other sustainability themes, for example water catchment issues. Links were made with the high school and Senior Science Preliminary syllabus with the teacher integrating the project into her teaching program.

To enable MacICT and Macquarie University to disseminate the findings of the LEP to a wider



audience, ethics approval was sought and gained from Macquarie University Ethics Committee and from the NSWDEC (SERAP) for this fourth iteration, 2011.

The research aspect of the LEP in 2011 has a focus on two research questions:

1. Can high school science students plan and manage their own fieldwork inquiry incorporating the use of mobile devices and Web2 technologies?
2. To what extent does the use of mobile technologies assist this student-directed inquiry process?

Student Direction

The high school students designed their own outdoor mobile learning activities that addressed their chosen syllabus outcomes.

In the classroom student self-regulation was evident because they demonstrated autonomy and initiative relating to their chosen syllabus outcome. Hence minimal attention to the disciplining and regulation of student behaviour was required. There was a strong positive social support for learning and mutual respect among teachers, students and others assisting students' learning. The classroom was free of negative personal comments or put-downs.

The assessment tasks were designed in collaboration between the classroom teacher and

the MacICT support team. Students' lesson design, use of technology and observable performance-based tasks were graded. (See Appendix D: Project Assessment Task Rubric) High school students' science understandings were tested during their final year examination.

Teacher Professional Learning

This project has been registered with the NSW Institute of Teachers and provides teachers with 17 hours of accreditation at professional competence level and will address the following Professional Teaching Standards: 1.2.4, 3.2.1, 3.2.4, 4.2.5, 6.2.1, 6.2.4, 6.2.6, 6.2.8, 7.2.1, 7.2.4. (See Appendix E My PL Accredited Course).

At the beginning of the iteration one full teacher training day was held to familiarise this teacher with the project, and provide a workshop on the main software to be utilised (Learning Activity Management System). This day contributed five hours of accredited professional development. The teacher will gain a further 17 hours by being involved for the whole iteration.

The high school teacher involved in Iteration 4 of the LEP was an engaged, enthusiastic participant of the project. As a result of engagement with the LEP, she effectively incorporated a more student directed pedagogical approach as well as new technology skills into her year 11 Senior Science teaching program.



Project Partners

WHO	CONTRIBUTION
MQ	
Dr. Kathy Stewart Department of Education	Foundation member of the project and academic partner
Andreas Utomo Kuswara Department of Education	ICT consultant; project research
MELCOE	The project used LAMS and LessonLAMS software with high school students
Sustainability department at Macquarie University	Working in collaboration with MacICT to develop a sustainability tour around campus using iPads
DET	
DER Directorate	Held the Unconference in Darling Harbour which the LEP project team attended and led a round table discussion. Also ran workshops demonstrating ARIS



Iteration 4

Description

In 2011 Cherrybrook Technology High School (CTHS) and John Purchase Public School (JPPS) participated in the LEP project. The project team worked very closely with the teacher and ten students in a year eleven Senior Science class from CTTHS over term one and two and part of term three. The team guided the high school students to design, develop and teach their lessons based on the syllabus (See Appendix F: Senior Science Syllabus Outcomes) to each other and a year five class from JPPS, their local primary school. The structure of the project can be found in *Fig 2*.

Using the LEP Framework (Fig 1), 2011 goals were focused on each of the three components; pedagogy, technology and content.

1) Pedagogy. High school students mentoring worked well in 2010 so continued in 2011. However, the high school students had a more complex and involved role of designing the field activities for their class peers and their primary student partners. The purpose of this was to differentiate the learning for the high school students and engage them in their learning in a deeper way.

To ensure this worked successfully the LEP team created numerous easy-to-manipulate LAMS scaffolds that included example field activities

that incorporated the processes 'explain' 'act' 'evaluate' (See Appendix G: LEP LAMS Scaffold). This was modeled to students at the beginning of the iteration to show them how they could structure the lessons they were going to design. (See Appendix H: Student Work Samples).

2) Technology. In 2011 the team trialed using QR codes and i-nigma (a scanning application on the iPhones), with the aim of enabling students to be more independent in the field and explore their environment in a self-directed manner. LessonLAMS (an online version of LAMS) was utilized to enable students to design learning sequences and assist student centered mentoring (See Appendix I: Technical Report for the detailed list of hardware and software deployed in LEP 2011).

3) Content. In 2011 there was a focus on the year 11 Senior Science syllabus, which included local environments and biodiversity content (See Appendix F: Senior Science Syllabus Outcomes). Primary students were doing a unit called 'Murder Under the Microscope', so were possibly more engaged on the field day due to some similarities in the science content between their unit and the high school syllabus.

In 2011, the project team aimed to increase the online delivery of LEP, allowing schools outside of Sydney to be involved. Online activities designed using LAMS were trialled by teachers and students. This was developed due to schools outside of the Sydney Basin previously having regularly expressed an interest in elements of the project but being unable to participate in person. In 2011, the online version was trialled and evaluated by a number of interested schools, including Sussex Inlet Public School, Westport High School and Cherrybrook Technology High School.

A number of separate events and workshops were run additional to the face-to-face and online LEP (see Project Participation Data). These provided the project team a chance to trial different technologies and new ideas. The participant's and team's reflections of these experiences continually contribute to the modifications and developments of the LEP.

Fig 2. LEP Project Timetable

	Project Planning		Initial learning about LEP Technologies		Designing learning activities		Presenting learning activities		Evaluation	
Students	Video Conferencing for teacher PD & project communication	Linking LEP and senior science syllabus	Use of Edmodo	Field Day	Selecting syllabus topic	In-Class learning activity development	Field Day mentoring session	Workshop in response to students' requests	to primary students	reflection on project
			Communicate with teacher & MacICT	initial learning about LEP mobile technologies	select topic	as designers	trialing & critically reflecting on prototypes	participating in LAMS, QR, Voki, Google Maps workshops	presenting	participate in interview & online survey
Teachers	Participating	programming & assessment tasks	Communicate with students & MacICT	guiding, assisting, supportive coach	guides & directs students' selection	as supportive coach	supportive coaching	supportive coaching	assessing	participate in interview
	Presenting	programming & assessment tasks	Communicate with students & teacher	design & presenting examples of mobile outdoor activities	familiar with the syllabus topics	as consultants on technology & pedagogy	prototyping mobile outdoor activities	mentoring & presenting	assessing	data collection & analysis

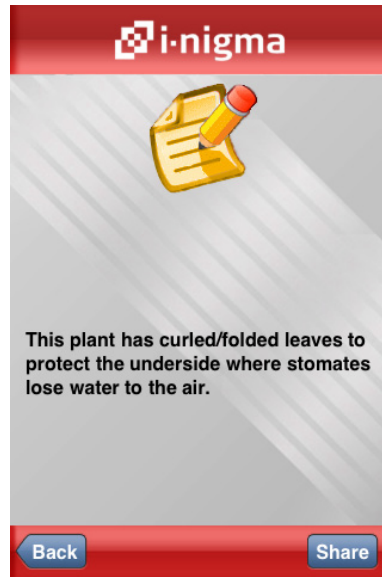


Project Participation Data

SCHOOLS	TEACHERS	STUDENTS	REGION
Cherrybrook Technology High School	1	10	NSR
John Purchase Primary School	1	30	NSR
Sussex Inlet Primary School (online LEP)	1	30	South Coast
Westport High School (online LEP)	1	30	North Coast
Cherrybrook Technology High School (online LEP)	1	30	NSR



EVENTS AND WORKSHOPS	PARTICIPANTS	TECHNOLOGIES	LOCATION
Environmental Education Centre Conference February 2011	30 participants	iPhones, QR Codes, i-nigma	Avoca
Rotary Students 17 May 2011	Workshop: 2 teachers, 10 students	iPhones, QR Codes, WordPress, i-nigma	MacICT
Unconference 20 & 21 June 2011	Workshop 1: 20 school teachers Workshop 2: 15 school teachers 7 high school students	iPhones, QR Codes, ARIS, WordPress, i-nigma	Darling Harbour
6th World Environmental Education Congress 19-23 July 2011	Workshop: 30 school teachers & environmental educators	iPhones, QR Codes, ARIS, WordPress, i-nigma, Nova 5000	Brisbane
NSW Environmental Educators Conference September 2011	30 participants	iPhones, QR Codes, i-nigma	North Sydney Boys High School
Regional Technology Hub 23rd September	Workshop 7 participants	iPhones, QR Codes, i-nigma, ARIS	Arncliffe
Merrylands High School Game Design Workshop	Workshop: 1 school teacher, 30 high school students	iPhones, ARIS	MacICT
3DedRats October 2011	Workshop: 3 school teachers, 40 high school students Game On Day: 76 participants Armidale Slex Event: 23 participants.	iPhones, QR Codes, i-nigma	MacICT, MQ Library MQ Library Armidale
LAMS Conference 9th December 2011	Keynote presentation by 4 students and their teacher. 60 participants. Workshop: 15 participants (teachers, academics, researchers)	LAMS sequence iPhones, QR Codes, i-nigma	Macquarie University



Findings

Some of the key findings from LEP Research 2011 are summarized under the following LEP framework headings.

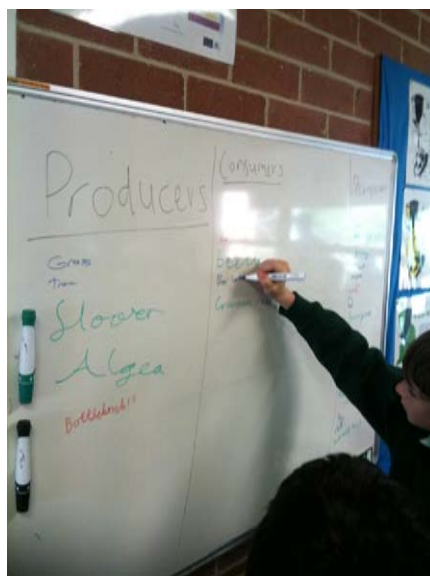
Pedagogy

- Students are effective and creative designers of mobile activities (See Appendix J: Senior Science Work Sample Lesson Plan)
- Activities demonstrate deep knowledge, understanding and engagement with the senior science syllabus concepts (See Appendix K: Final Year, Year 11 Examination Results)
- The mobile learning activities designed by the High School mentors were well targeted, complex, contemporary, engaging, varied and fun for the primary students (See Appendix L: Survey Results, colour coded pink)
- Acting as a teacher motivated the students to appreciate the teaching role and critique conventional teaching approaches. They incorporated more contemporary, technology based, student centered activities into their designs (See Appendix J: Senior Science Work Sample Lesson Plan; Interview data group B)

- Students involved in the project valued working and learning outside the classroom (See Appendix L: Survey Results, colour coded green)
- For high school students involved in LEP, mentoring the primary students was the most memorable aspect of the project (Interview data groups A, B, C, D, E)

Technology

- Mobile technology deployed by the project assisted students to learn science concepts (The mobile phone with internet access could direct students to information about the object they were physically observing in the field; student interview data. Interview data from group B)
- Students were competent and adept at selecting, manipulating and utilizing LEP mobile technologies to design and deliver learning activities (See Appendix I: Technical Report)
- Students enjoyed using technology, and secondary students in particular were motivated by the novelty and ubiquity of LEP mobile technologies which they perceived to be part of their world (See Appendix L: Survey Results, colour coded blue)



- The technology deployed by the LEP project 2011 has proved to be robust and reliable in the field (See Appendix I: Technical Report)

Content

- Students can transfer their learning from the classroom to their wider environment as a result of their involvement in this project (Interview data from group A; interview data from LEP Team)
- As the result of being involved in the LEP, students recorded that they, for the first time, were successful science learners – they learned what it took to learn science effectively (Interview data group D)

Implications for 2012

- With proof of concept successfully completed in 2011, MacICT can consider scaling up the LEP to involve more schools
- Continue with student-directed learning pedagogies involving teaching and mentoring younger students
- Consider developing augmented reality beyond QR codes



Conclusions

Students who are given the ability to design inquiry based fieldwork learning activities utilizing mobile technologies have demonstrated, through their activity designs and assessment results, a deep understanding of the syllabus content.

The elements of the mobile learning activities that contribute most strongly to students' learning are the ability to choose their own technologies and the role of being mentors for primary students as they work collaboratively to conduct fieldwork. Students are intrinsically motivated by the teaching and mentoring aspects of the project.

Locating learning outside using mobile devices has resulted in observable transfer of students' learning from the classroom to the real-world.

The high school students, as designers of mobile activities, are capable of translating the syllabus content into a truly engaging contemporary learning environment.

Potential for development

The project has a track record of producing popular conference presentations and publications. Ethics application through Macquarie University and DEC ensure that the work of the LEP is communicated to the widest possible audiences. Considering this history, the work of the LEP could be developed into a broad framework to guide teaching practice in mobile learning.

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Appendix A: Links to MacICT Strategic Plan

STRATEGIC PLAN OBJECTIVES	PROJECT ACTION
Professional Learning	
1.1 Course and project evaluations will be highly rated and regarded	LEP requires students and teachers to complete pre- and post- SurveyMonkey surveys. The LEP team uses the responses to direct the future direction of the project, making changes where required.
1.5 Recognition and accreditation is available with all courses and projects	Teachers involved in Iteration 4 of LEP receive 17 hours of accreditation and an additional 5 hours for one face-to-face workshop at the beginning of the iteration.
Students' and Teachers' Participation	
2.1 School participation in projects will be sustained throughout the course of the project	The schools involved in LEP maintain close links with MacICT as a result of their successful involvement with the project.
2.2 Improved data collection	The LEP team have added data collection methods to the already existing methods used in past iterations. Edmodo, Wordpress, Basecamp store data such as team reflections and administration. Photos, videos and voice recording are used on field days to report on field days (days with students). SurveyMonkey is used to collect information on students' and teachers' pre- and post-project knowledge and attitudes.
2.3 Online collaboration between teachers and students will increase	Iteration 4 introduced the use of Edmodo for students, teachers and the LEP team to communicate and collaborate with each other. Regular planning emails were sent with the teacher, and several VCs further increased collaboration.
2.4 An increased focus on middle years students in Centre projects	Middle years students involve in trialling mobile technology for 3DedRats.
Partnerships and Research Links	
3.1 Increased industry partnerships	LEP is included in the initiation of a MQ research project involving Nokia.
3.2 Increased collaborative research with University	LEP research team formalized their research agenda by acquiring Macquarie University and DEC ethics approvals.
3.3 Extend the current reach of the Centre, ideally across the State and possibly globally.	A number of conferences were attended and presented at, some of which were further afield than the reach of previous LEP iterations. The team presented at the Environmental Education Centre Conference in Avoca, the Unconference in Darling Harbour, the 6th World Environmental Education Congress in Brisbane, the NSW Environmental Education Conference and the 6th International LAMS & Learning Design Conference at Macquarie University.
3.4 Continue to engage in sharing and discussion of research and innovation with online communities of educators	Yammer and the MacICT public blog became regularly used as online networking sites for Iteration 4.1. Comments and posts promoted the project and informed others of progress and events.
Research Projects	
4.1 Focus on risk taking innovation to explore and explain pedagogical opportunities and to research pedagogical practices in specific disciplines	The LEP research team investigated the use of mobile technology to support student directed inquiry activities based in the local environment.

STRATEGIC PLAN OBJECTIVES	PROJECT ACTION
4.2 Research leadership will be strengthened	The LEP research team gained ethics approval from Macquarie University (SERAP) to do the research for the project and collect required data
4.3 Research support will be provided	Research support was provided by the Department of Education, Macquarie University.
4.4 Research productivity and accountability will occur through publications derived from each Centre project	See objective 3.3 for conferences at which the team presented
4.5 Research productivity will be effectively translated into innovative teaching and learning practice	The LEP team incorporated research findings into the conference presentations and workshops mentioned in this report.

Appendix B: Links to North Sydney Region Plan

NSR	PROJECT
Regional Targets	<i>Differentiated Learning Programs</i> Improve access to differentiated curriculum for all students
	<i>Student Leadership</i> Enhance student leadership opportunities
Delivery strategies	<i>Middle/Later Years:</i> At least 4 video conference information and teacher training and support sessions throughout the project; In-school student and teacher training using mobile learning technologies in the field; One-day learning design teacher training workshop; one-day wiki teacher training workshop; school-school student video conferences.
Assessment and evaluation strategies	Survey Monkey student and teacher evaluations; Regular Edmodo student and teacher reflections throughout project (at the end of every lesson); Student work samples; Teacher unit of work; self-assessment, peer- and teacher assessment tasks and rubrics; student-created fieldwork learning design implementation with buddy partners; Student and teacher video interviews; Shared Local environmental management plan; final video conference student work presentations;
Regional outcomes	All students access mobile learning technologies; All teachers adopt student-centred approaches to teaching and learning opportunities in the field; All students engage in authentic sustainability learning; Schools collaborate to develop shared community-based environmental sustainability strategies; All senior students access leadership opportunities during the implementation phase. Increased individual capacity to lead 21st century schools.
Regional indicators	Mobile learning technologies are embedded into teaching and learning activities Evidence of sustainable practices in teaching and learning programs
Issues and resolutions	Schools still using MacICT equipment. Need to use 3G data plan because schools do not have wireless solutions outside the classroom.

<p>Achievements</p>	<p>2 registered teachers 2 registered schools</p> <p>2 NSR schools: 100% Cherrybrook THS John Purchase PS</p> <p>10 Year 11 Senior Science students and 30 Year 5 GATS students participated</p> <p>MQ Ethics Approval and SERAP approval granted to explore the benefits of students designing their own mobile learning activities.</p> <p>MacICT trained 7 Sydney Region teachers for iPad trial.</p> <p>MacICT presented at: GATS Conference (NSR) World Environmental Education Conference (WEEC) Brisbane DEC Unconference NSR CC day LAMS International Conference</p> <p>3dedrats: MacICT designed a mobile phone game to raise awareness about Building Sustainability for the new MQ Library. 110 people participated in this self-guided tour/game at Game On.</p> <p>MacICT designed a mobile phone game to promote the local businesses attending the SLEX (Sustainable Living Expo) in Armidale for DEHub (UNE) October. This was one of the most popular activities at the Expo.</p>
<p>Research agenda / Future plans</p>	<p>Identify schools with wireless devices and wireless access outside the classroom</p> <p>Work in collaboration with Nokia and University of Canberra to design case study for the use of Near-Field Communication technologies within cultural organisations.</p> <p>Work in collaboration with Microsoft and Nokia to develop student and teacher workshops for Windows Phone 7 mobile phone apps development.</p> <p>Participate in Imagine Cup 2012.</p>

Appendix C: Quality Teaching Framework

STRATEGIC PLAN OBJECTIVES	PROJECT ACTION
Intellectual Quality	
1.1 Deep knowledge	Students focused on one portion of the year eleven Senior Science syllabus, which allowed them to gain deep knowledge of this content. Taking on a design, develop and teach engaged the high school students and led to their deep knowledge of the topic.
Quality Learning Environment	
2.6 Student direction	This was the main focus of the project in 2011. Students were to direct their own learning by taking on the role of the teacher- to design, create and then direct others while engaging in their activities.
Significance	
3.5 Connectedness	Field work was carried out in a remnant bushland area adjoining both the high school and primary school. This enabled students to be highly engaged with the content (local environment and biodiversity) they were learning as it connected to their world; the natural world surrounding them.

Appendix D: Project Assessment Task Rubric

		Criteria			Value
		1-2	3-4	5-6	7-8
Activity Sequence Content		Information presented is incomplete and/or irrelevant. Dotpoint not covered.	Information presented is incomplete and/or irrelevant, Dotpoint only partly covered.	Information presented is correct, but fails to elaborate. Dotpoint is covered	Student demonstrates full knowledge (more than required) with explanations and elaboration. Dotpoint thoroughly covered.
Organisation of Activity sequence		Sequencing of ideas is unclear	The main idea of the activity sequence is understood, but the organizational structure made it hard to follow.	The organization of the activity sequence made it easy to follow most of the time.	The organization of the activity sequence made it easy throughout the entire activity sequence.
Use of mobile media		Mobile media is not used	Mobile media is used to conduct outdoor activities	Mobile media is used to conduct outdoor activities in a way that engages students	Mobile media is used to conduct creative and innovative outdoor activities that engage students.
Choice of activities		Less than 3 types of activities used	Multiple types (at least 3) of activities used in activity sequence but students not always engaged	3) activities used (engages students at all times) in activity sequence	Many different innovative and creative activities used (engages students at all times) in activity sequence
Presentation of activity sequence to Year 11		Student mumbles, incorrectly pronounces terms, and speaks too quietly for all audience members to hear. No eye contact with audience, body turned away, many hesitations in presentation. Correct scientific terms not used.	Student incorrectly pronounces terms. Audience members have difficulty hearing presentation. Some eye contact but body turned away most of time, some hesitations in flow of presentation. Correct scientific terms sometimes used.	Student's voice is clear. Eye contact most of the time, a few hesitations in flow of presentation. Correct scientific terms mostly used.	Student used a clear voice, good eye contact, no hesitation in flow of presentation. Correct scientific terms always used.
Presentation of activity sequence to Year 5		Students not prepared and present material poorly. Very little interaction and communication with Yr 5 students.	Students lack some preparation and hesitant in presenting material. Interaction and communication with Yr 5 students poor.	Students prepared and present material in a confident manner, appropriate communication and interaction with Yr 5 students	Students well prepared, present material confidently, excellent communication and interaction with Yr 5 students
					/48

Appendix E: My PL Accredited Course

COURSE CONTENT

COURSE DETAILS

Rationale

Participating schools will investigate environmental issues affecting their local ecosystem. They will work together using mobile technologies to collect the relevant data and begin monitoring their ecosystem as a joint collaborative community project. The project will enhance the building of a community of schools with a shared common purpose; facilitate the sharing of professional dialogue, resources and expertise and enhance the ICT skills of all participants.

Outline of Content

This project will involve teachers and students from Years 5-9 in neighbouring schools, working together over a term, to investigate their local ecosystem. By collecting, collating, analysing and comparing data using various mobile technologies, databases and web 2.0 tools they will endeavour to determine the level of biodiversity of their local ecosystem. The participating Years 5-9 students will use the mobile technologies in small, mixed groups at a Simulation Day at MacICT, a field day local to their school and classroom activities to pursue their ecosystem investigations. Reflections on findings, mentoring activities, employed strategies etc will be analysed throughout the project using tools such as video conferencing, surveys and wikis.

Board of Studies Syllabi addressed by this Course

Throughout this project, students will be able to create artifacts of their learning that represent a range of disciplines and literacies. This interdisciplinary approach to inquiry-based learning includes studies in science (environmental science, biology, ecology); visual arts (drawing, digital photography, surrealism, photo image editing); English (writing, talking and listening, reading); mathematics (data, numeracy, measurement); performing arts (music, drama).

Research or Methodology that underpins this Course

Outline of Delivery Strategies

The project's team will support teachers' learning through:
 # a face-to-face professional learning day as an introduction to the project;
 # participation in a number of professional learning activities throughout the project's duration including pre and post online surveys and video conferences;
 # informal and formal discussions, planning forums, the project wiki and the project's showcase day.

Outline of Assessment Strategies

Throughout the project teachers will be expected to show evidence of their own learning through such activities as:
 # identification of project learning goals for students;
 # personal reflections and discussions of their own teaching strategies via online tools eg Video Conference, survey monkey, wiki and informal meetings and planning forums;
 # completion of assessment tasks before Simulation Day, using mobile technologies and web 2.0 tools;
 # participation in Simulation Day activities with their students, demonstrating their own learning of the technologies being used and monitoring student collection, collation and analysis of data;
 # participation in the planning, assessing and evaluating of activities for the field day;
 # providing feedback to students via wikis, oral and written comments;
 # monitoring student activity online, in line with DET Cyber Citizenship policies;
 # writing an article reflecting the outcomes of their students' participation in the project which could be used in their school's newsletter, MacICT publications or similar.

OTHER DETAILS

Course Duration	17.00 hours
DET Professional Learning Priority Area(s)	Use of ICT for teaching and learning Literacy and numeracy Quality teaching
Target Group	All DET Staff
DET Employees Only	Yes
Regional Availability	
Maximum Participants	10
Minimum Participants	2
Proposed Participant Cost	Government: \$100.00

Any Special Requirements for Participation

This project involves students in the middle years of schooling, that is Years 5-9. The participating schools need to be prepared to work together investigating an area local to both schools.

Any recognition to teachers completing the course, or credit transfer into recognised qualifications

Evaluation Process for this Course

Participants will be expected to complete online pre and post evaluation surveys accessed through the MacICT wiki and to participate in a video conference at the end of the project to critically evaluate the project outcomes and ways in which it could be improved.

Further Details

Contact the course developer for any further details.

NSW IT REGISTRATION	
NSW IT REGISTRATION DETAILS	
Registered Course Code	151NSR041
NSWIT Registered Hours	17:00
Course Type	Program
Student Stage	3,4
Syllabus	Key Learning Area
Not Applicable	Not Applicable
Stage	Subject
Not Applicable	Not Applicable

Appendix F: Senior Science Syllabus Outcomes

8.5.1.2.3 - identify the factors determining the distribution and abundance of a species in each environment and 8.5.1.3.1 - Use transects, random quadrats, capture-recapture and tagging/ marking methods to make estimates of real or simulated populations of organisms and use the available evidence to discuss the advantages and disadvantages of these methods

8.5.2.3.2 - construct food chains and food webs to illustrate the flow of matter and energy and use the available evidence to discuss the relationships between different organisms in the ecosystem and 8.5.2.2.3 - identify uses of energy in organisms and 8.5.2.2.4 - describe the flow of energy through a natural ecosystem

8.2.1.2.3 - discuss ways in which plants optimise water uptake and 8.2.1.3.3 - identify adaptations of some plants that assist in reducing water loss and 8.2.1.3.4 - identify the different ways in which a range of terrestrial animals reduce water loss

8.3.6.2.1 - explain the benefits of genetic diversity for a species and 8.3.6.2.2 - identify reasons why Australian plants become endangered and 8.3.6.2.4 - discuss reasons for conserving Australian species of plants and 8.3.6.3.1 investigate and summarise one strategy used to protect one rare Australian species

8.3.5.2.1 - outline ways in which vegetative propagation and regeneration occur in Australian native plants including lignotubers, epicormic buds or runners and 8.3.5.2.4 - describe processes of tissue culture and reasons for its use and 8.3.5.3.1 - identify data sources, gather, process and present information from secondary sources to identify Australian research involving cloning and tissue culture of plants and the purpose of this research, using an example such as the Wollemi Pine

8.2.5.2.2 - define what is meant by a catchment area and 8.2.5.2.3 - identify a local catchment area and the sources of water feeding into this catchment and 8.2.5.2.4 - describe possible sources of contamination that may enter catchments and 8.2.5.3.4 - gather, process and present information from secondary sources to identify some major disasters involving water pollution

8.2.5.2.2 - define what is meant by a catchment area and 8.2.5.2.6 - explain how water quality in one area can impact on the water quality in other areas and 8.5.2.3.3 - gather information from secondary sources concerning the use and treatment of local water

Appendix G: LEP LAMS Scaffold

The screenshot displays the LessonLAMS web interface. At the top left, the logo 'LessonLAMS' is visible. Below it, a user greeting 'Welcome Kathy (Logout)' and a 'Manage your account' button are present. A blue navigation bar contains the text 'Create/Edit lessons'. The main content area features a yellow box labeled 'Explain Act Evaluate'. Below this, a diagram shows a 'Big Idea' box with an arrow pointing to an 'Optional Activity 2 - Activities' box. This activity box contains 'Explain' and 'Act' sub-sections. An 'Evaluate' box with 'Share Resources' and 'Forum' sub-sections has an arrow pointing to the 'Optional Activity' box. To the right, an 'Other Options' sidebar includes 'Browse Templates' (with the text 'Explore ready-to-use teaching ideas') and 'Create your own' (with the text 'Build a lesson from scratch'). At the bottom, four blue buttons are arranged horizontally: 'Preview' (with a magnifying glass icon and the text 'Preview it as learner'), 'Simple Editor' (with a pencil icon and the text 'Edit lesson content'), 'Full Author' (with a notepad icon and the text 'Change anything'), and 'Launch!' (with a play button icon and the text 'Run lesson now with your students').

Appendix H: Student Work Samples

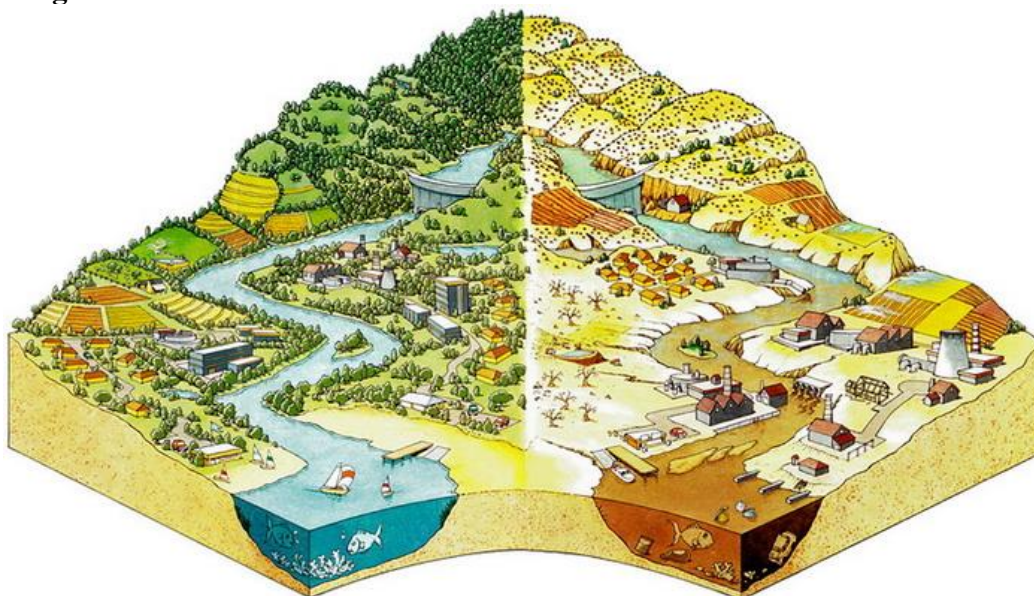
Work sample 1

EXPLAIN:

What is a catchment?

A catchment is an area of land where water collects when it rains, often bounded by hills. As the water flows over the landscape it finds its way into streams and down into the soil, eventually feeding the river. Some of this water stays underground and continues to slowly feed the river in times of low rainfall. Every inch of land on the Earth forms part of a catchment. Catchments are complex and something happening in one part of the catchment can have a big impact on other parts. In Australia, the past 200 years has seen big changes to our catchments. Natural landforms such as bushland and small creeks have been replaced in many areas by houses, roads, footpaths and stormwater pipes. This has had a large impact on our creeks and rivers. (Reference: <http://www.georgesriver.org.au/What-is-a-catchment.html>)

Diagram of a Catchment:



A less impacted catchment vs. a highly impacted catchment

ACT:

Log in to Sixviewer by scanning this code with the i-nigma App on the iPhone. Search for the Place Name 'Cherrybrook' to locate where you are. Use one of the small icons in the top right corner to compare what Cherrybrook looks like now and what it looked like in 1943. Voice record your comparison using the Voice Record App on the iPhone. How would the Cherrybrook catchment have been affected by the changes since 1943?



EVALUATE:

Walk around the school and use the iPhone to take photos of things that may impact the catchment e.g. rubbish, bins, drains, plants, etc.

Upload the photos onto your laptop and create a presentation with them. This can be done in any way you like!



Work sample 2

The screenshot displays the LessonLAMS user interface. At the top, there is a navigation bar with "Create/Edit lessons" and "Run/Monitor lesson" tabs. The main content area shows a lesson sequence for ID "_110530a". The sequence consists of seven "Noticeboard" activity boxes and one "Assessment" box, connected by arrows indicating a flow. Below the sequence are four main action buttons: "Preview" (Preview it as learner), "Simple Editor" (Edit lesson content), "Full Author" (Change anything), and "Launch!" (Run lesson now with your students). On the right side, there is an "Other Options" panel with "Browse Templates" (Explore ready-to-use teaching ideas) and "Create your own" (Build a lesson from scratch). At the bottom, there are sections for "Recent sequences" listing "_110530a", "_110530b", and "Your Amazing Brain_22052011_1", and "Need some help?" with links to "LessonLAMS Getting Started" and "LAMS Documentation".

Appendix I: Technical Report



Purpose

The table below represents the technology choices made by the five high-school groups participating in this year's LEP.

L: deployed in Lab, M: deployed outside.

Group	A	B	C	D	E
Hardware					
iPhone	M	M	M	M	M
iPad					
Flip Camera		M			
Nova	M			M	
DEC Netbook	L, M	L, M	L, M	L, M	L, M
Software					
QR Code	L, M	L, M	M	M	
i-nigma	L, M	L, M	M	M	
ARIS					
Lesson LAMS				L	
Edmodo	L	L	L	L	L
Blog			M	M	
Voki				L	
MS PowerPoint	L, M	L, M	L, M	L, M	L, M

Description

TECHNOLOGY	DESCRIPTION	COST	UNITS AVAILABLE
Hardware			
iPhone	iPhone 3GS 16GB, Internet: WiFi/3G, Camera, iOS 4.0	Purchase cost \$449/pcs, operational cost \$10/month mobile plan	15
iPad	iPad 16GB, Internet: WiFi/3G	iPhones, QR Codes, ARIS, WordPress, i-nigma	Darling Harbor
Flip Camera	Standard MacICT Stock		15
Nova	7 inch TFT LCD screen (800 x 480 pxl, 65,000 colors), Touch screen 128 MB RAM, 256 MB NAND Flash memory 24 cm x 18cm, mass 1.1 kg Wireless and Ethernet 3 standard USB SD card slot VGA out Windows CE5 operating system 2003 Multilab for data logging NovaPaint for drawings WordPd and TextMaker for word processing NovaNotes for audio, and note taking and Presentations for authoring	Purchase cost \$925/pcs, excluding probes. See http://www.nova1to1.com/sensors.php for sensors	15
Netbook	Standard DEC issued Netbooks already owned by the school	School owned	Arncliffe
Software			
QR Code	QR code (Quick Response code) is a type of two-dimensional matrix barcode which can embed data accessible through a QR reader. The project uses the QR generator at http://qrcode.kaywa.com/	Free	
i-nigma	i-nigma utilize the iPhone camera as a barcode reader. See http://bit.ly/v119yF	Free	
ARIS	Augmented Reality Interactive Storytelling (ARIS) is a tool for making location based games, stories and Art. See http://bit.ly/sWdfLI	Free	
Lesson LAMS	An online version of LAMS (www.lessonlams.com) Does not require a server installation, offered as an online service	Free	
Edmodo	Free online Facebook-like secure social media (www.edmodo.com) Each teachers and students need to be authenticated and enrolled into the class' Edmodo space	Free	
Blog	MacICT hosted a private blog to host content from participants. Accessible publicly at http://web2.macquarieict.schools.nsw.edu.au/	MacICT Hosted	
Voki	Voki is a tool to create a customized animated avatar, available at http://www.voki.com/	Free	

Appendix J: Senior Science Work Sample Lesson Plan

LESSON TITLE: 8.5.2.3.4 Energy flow Producers to consumers to decomposers		
DATE:	TIME:	DURATION:
TRAINING AIDS/EQUIPMENT		
Photos, Camera, Powerpoint,		
AIMS/OBJECTIVES		
Discuss flow of energy through an ecosystem		
INTRODUCTION		
Motivation: We can learn to get a better understanding of the plants and animals around us		
BODY		
Students	Teaching Point	Resource/Conduct
Listening	<p>Powerpoint → Brief summary of energy through ecosystem</p> <p>Photos/Examples</p> <p>Explain</p> <p>Producers → A living thing which can produce their own food e.g. Plants, this includes grass</p> <p>Can Anyone Name another example? Candy</p> <p>Consumers → A living thing which relies of other living things so survive e.g. Animals, this can be anything from us humans to zebras</p> <p>Can Anyone Name another example?</p> <p>Decomposers → Feed off living things which have died and recycle it back to the ecosystem.</p> <p>e.g. Mushrooms.</p> <p>Can Anyone Name another example?</p> <p>These make up the different classes of organisms within an ecosystem.</p>	<p>Projector/Powerpoints</p> <p>Estimated Time – 10 -15 mins</p> <p>Coloured Cardboard</p>

	<p>Activity → Give students example animals and make them get in a line in order</p> <p>QR CODE IPHONES</p> <p>Every student gets a photo, work together to see who goes where.</p>	<p>5-10minute</p> <p>iPhone</p>
	<p>Activity → Go Outside</p> <ul style="list-style-type: none"> Take photos of Producers, Consumers and Decomposers within the ecosystem Form food web with photos iPad/Paper/Board 	<p>iPhones/Cameras</p> <p>AS LONG AS WE WANT</p>
	<p>Discussion → All these organisms obtain energy from the sun or each other. What would they use this energy for?</p> <p>What do the organisms use this energy for?</p> <p>e.g. we are organisms as well (think of what we use energy for)</p> <p>Moving around, Reproducing, Breathing, Maintain body temp</p>	<p>Laptop – Typing answers onto laptop</p>
QUESTIONS		
1) How do consumers gain their energy?		
2) Can someone name a decomposer?		
3) What plants and animals did you find when you went outside?		
4) What are some ways animals use energy for?		
SUMMARY		
CONCLUSION		

Appendix K: Final Year, Year 11 Examination Results

	Group	Group A Questions	Group B Questions	Group C Questions	Group D Questions	Group E Questions	% Mark for LEP Questions	% Mark for Non-LEP Questions	Total Exam %
		/5	/8	/5	/6	/5			
Student 1	A	5	7	1	6	5	83	94	90
Student 2	A	4	7	4	6	4	86	88	89
Student 3	B	4	7	4	6	5	90	84	86
Student 4	B	5	7	5	5	5	93	76	83
Student 5	C	5	6	2	1	5	66	49	54
Student 6	C	5	7	5	6	5	97	78	85
Student 7	D	5	5	4	6	5	86	78	81
Student 8	D	5	4	1	6	5	72	69	70
Student 9	E	2	4	3	0	2	38	37	38
Average		4.4	6.0	3.2	4.7	4.6	78.9	72.8	75.0

Appendix L: Survey Results

Primary School Student Post-project Survey

A	B	C	D	E	F	G	H	I
Think about your experiences while you were involved in Local Ecostudy Project 2011. Did you enjoy being part of the project? Explain.	Was there anything about the project you DID NOT enjoy? Explain.	Comment on your experience of working with a high school mentor.	Were there any computer devices that you enjoyed working with in the Local Ecostudy Project? Explain.	Was there any software that you enjoyed working with in the Local Ecostudy Project? Explain.	Explain what you understand by the term 'biodiversity'.	What are some ways you could measure biodiversity in your local area?	Has being involved in this project changed the kinds of things do you do to look after the environment? Explain why or why not.	After being involved in this project do you think there are advantages to learning outside the classroom? Explain why or why not.
I loved it. I liked it because it was fun and educational. I also liked it because you could use the ipod and the ipad.	there was nothing that i did not like it was perfect	it was really fun, but some of the questions that our group asked the high school students didn't know, but that was OK. the high school students were very nice.	I liked working with the ipod and scanning the card things(I forgot what the cards were called) I also liked working with the ipad and drawing the pictures of unreal creatures on it	i liked the inigma	biodiversity is when an animal gets hot pr cold and how the animals skin protects it	go in the shade, stand in the sun	well saught of. ilokked after the environment even before the project.	yes there are advantages because when you are learning outside kids can get more active and work together more.

A	B	C	D	E	F	G	H	I
Yes I did. It was a great experience being with the Cherrybrook Technology High students as well as the Maquarie University students and teachers. It was a once in a lifetime experience	I did enjoy every thing we did and the only bit I didn't enjoy was looking for small bugs that lived under the piles of logs and getting my hands all dirty and sticky	I learnt a lot from the high school teachers and their students, especially when we looked at what happens when we build near waterways	I enjoyed working with the Nova pads and the iphones.	I enjoyed every bit of software they used.	Biodiversity means that the catchment are filled with the pollution and damages the ecosystem	You could go down to the catchment and measure the amount of pollution by taking water samples	Yes it has changed the things I do because I used to think that the environment is being protected by law until I saw people littering around and throwing rubbish into lakes and ponds	Yes there has been many advantages in learning outside because you can get your body moving and do something active not just sit around in the classroom all day doing school work
I did enjoy being part of the project because I got to learn quite a few things and I also enjoyed using different devices outside.	There was nothing about the project that I did not like. I liked every part of the project	I had a lot of fun working with highschool people because they helped us learn and have fun at the same time	I enjoyed working with the ipods because we got to use them to scan different objects and it would show us a page with more information.	I liked using the paint on the computer to draw animals that would have different features and they would live in different areas	Biodiversity is the study of plants, animals, the ecosystem and how they live	You could measure biodiversity by counting plants or animals in a local area.	Being in the project has changed things I do for the environment because now I look out carefully and I do not pollute.	I think there are advantages in learning outside the classroom because you get to see things outside up close and you can still learn the same way.
I had very enjoyable experience learning about the environment fused with technology.	The only part about the Project that I did not LOVE is the creapt crawlies.	The experience of the high school mentor was fun because it wasn't a teacher but it wasnt a child.	The main computer device I enjoyed (and only used) was the iphones. Scanning the qr codes and taking pictures is much more FUN than you. think	the software i enjoyed using was the qr code scanner because it descrambles a picture into a website.	I uderstand the word as a friend ship between man animal and plants.	I finding out the amount of trees to the amount of people in the neighbourhood.	It has not because as it is i am quite environmentally friendly	I bring more fun into to learning about thing such as geography
Yes. It was pretty much an enjoyable time because we had	No not really, I liked using the technology to solve & do stuff.	It was a brilliant time as they weren't harsh or not caring for	My favorite one would have to be using Enigma on the ipod touches	My favorite program was Enigma because it could read links	Where the subjects of nature get an equal right.	Checking how many Tree's and plants are in your area.	It has, it warned me that small insects are everywhere in this	There are advantages to learning outside the classroom as

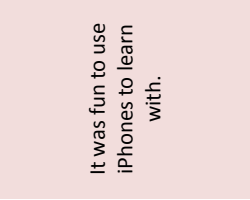


A	B	C	D	E	F	G	H	I
our High schoolers to help us out with the technology and such. Yes, the teachers objectives had us thinking about what to do and helped with all the things we did not know about. Yes, I did enjoy being part of the project and learning about nature and what happens when we change a certain thing, whether or not it was good or bad for the environment that surrounds us.	Nope, I enjoy every part of it, the program was lovely.	They are very keen to help us and their projects were very enjoyable.	I love the iPhones!!! The smart phone scanning codes are fun.	Oh yes! the iPhone app scanning barcodes part.	My understanding of the term BIODIVERSITY is united with all sorts of people	doing a survey.	yes they tell us ways of improving the environment	I/We could plant or study tree's and insects.
	No, I thoroughly enjoyed the experience.	It was a win-win because I enjoyed it and the Highschoolers got a fantastic opportunity.	Yes. There was the iPhone that made working easy.	The app that scanned a code place somewhere in our Turpentine Ironbark forest was enjoyable.	Biodiversity are living plants or animals found in nature.	You could count how many plants and animals there are in your local area.	Yes it's made me more determined to care for the environment.	Yes because you're more involved outside.
	No everything was entertaining with all the technology and equipment. They were very clever at making us occupied.	I liked the last activity with the scavenger hunt. The high school mentors were very kind and knew what they had to do.	I like one of the technology things they gave us. It was a cross between a DS Ipad and acomputer with internet and paint	I liked the computer and the phones with the decrypting code that we used. There were lots of other favourites but they were the best.	Biodiversity are all nature things like animals, bugs, plants all that kind of nature except they are all different kinds if them.	You could put cameras on animals or catch them and see if they are healthy or not. You could take samples of trees and see if they are healthy.	Yes it has told me that if nature and the environment is destroyed then we will die so we have to take care of the environment	Yes there are advantages of learning outside we get to play and learn with the environment outside next to a environment.
Yes I did enjoy the project because the activities were all fun and I learned a lot.								

A	B	C	D	E	F	G	H	I
Yes I did enjoy being part of the project as it did really interest me. The tech stuff really helped to.	Nope.	The CTHS mentors possess qualities that a normal school teacher cannot gain. They explained it quite well and it was very easy to understand. They also understand and can relate to us.	The Iphone because I am very famailar with it.	See 4*.	The range of of animals and plants around the world.	I could go around and try to explore our ecosystem.	Yes. I now aware and will happily recycle anything.	Of course! A big advantage is being able to see and discover things that you cannot see in a average classroom.
I did not enjoy creating the animals because the touch screen computers were not fully charged and went to sleep when we were in the middle of a drawing.	The high schoolers were very nice and NOT patronising. I enjoyed it a lot.		The part I enjoyed most was getting to use the iPhones and scanning those squares that take you to a website.	I liked using the photo technology on the iPhones.	Biodiversity is "bio" nature and animals and "diversity" as in different. so its like lots of different animals.	You could put hidden cameras or traps (not the killing type) to see what has been by. You could also put out food that that particular animals like you could see if they are around.	Not really because I already do a lot of things to look after the environment.	I think I learn better when I am interested and i LOVE the environment.
yes,because you got to use ipods and touch laptops and I could learn a lot.	It was fun learning stuff from highschoolers.		laptop, we got to do fun activities using the laptop	the ipod. we got to take many photos using it	they are the plants and animals in the world	I could walk and look at all the plants and animals	yes because i learnt to take care of the environments better	We can learn a lot more by doing hands on tasks outside.
I enjoyed it very much because i could learn off the older students.i enjoyed the diferent things we did and the diferent things i	I think it was great as i could learn importatnt things off them.		I enjoyed using the iphones and the little computer things.The computers were good to.	I liked the iphones ,the computer things and the normal computers were okay.	it basically means the number of plants and/or animals in your local area	you coul to your local park and try and count the differnt species of either plants or animals.	not really but now i understand in more detail why we do these things.	i thik there are great advantages in learning outside the classroom.you can do hands on activity and get some fresh air into.

A	B	C	D	E	F	G	H	I
learnt about nature								
yes, because i learnt a lot things in the process and it was fun.	no, everything was perfect.	it was fun and exciting for high scoolers to cme to our school and taught us about catchment areas.	i enjoyed using the ipods to works with in activities.	i liked the software for drawing on the big nintendo type devices.	biodiversity means diversity between local plants and animals.	i could look around and explore our ecosystem	yes, i now recycle a lot of things including bottles and some cans.	i think there are advantages of working outside of a classroom like you get fresh air and you work better.
Yes, I enjoyed being part of the project. We got to use all different types of technology including ipads, iphones and many more to learn about the environment.	No, not really. It was very enjoyable and I would like to do it again.	The high school students were very helpful and patient with us as we learnt how to use the new technology. Now I know what high schoolers are like! I do hope all high schoolers are like this.	Yes. The technology was all very interesting. The iphones and ipads,, the electronic writing pads and the electronic drawing pads were fun to use too!	All the software was interesting. I particularly liked the iphone, where you could scan something and it would give you information on it.	I am not really clear on what biodiversity means, but I can try. I think it means all the environment around us and the nature, basically.	We could survey the local area on what and how much there is of something.	Well, only a tiny bit. Not much. All we did around the environment was plant some potatoes, and learn about the roots and parts of a plant. It was all very informative, but it hasn't really changed how i look after the environment.	Yes. We actually did the activities hands on instead of boring old worksheets. I think that learning outside the classroom has many advantages, and we should definitely do it more often!

A	B	C	D	E	F	G	H	I
Yes, we did some very fun and exciting activities and it was a day I will never forget. Technology was a lot better than normal as of back then but now we have an iPad and iPod Touch! Thank you very much for all you're hard work. Ben.	No, everything was enjoyable.	Our mentor was kind and helpful and was impressed with my computer skills, this made me very happy as I am not normally with a High School student and it was great to know I made a good first impression. Ben.	Yes, all of them amazing, I am glad we got to work with iPhones, and the NOVA's were very cool indeed. Ben.	Inigma, an iPhone app that we used to scan barcodes that showed us thing on the web about the topic we were focussing on.	Biodiversity, means being united with all types of people.	I could measure biodiversity by comparing how much people around the community know about each other.	Yes, I am more involved with my community and participate in things like 'Clean Up Australia Day'.	Yes, as being outside of the classroom provides a new experience and it a lot more fun than Maths or English.
I did enjoy the project and I liked making the water stream and then adding the pollution.	No, I liked it all.	It was fun learning with them and they made it interesting.	Yes I liked the device that looked like an ipad but I forgot what it's called.	Yes I liked the scanning app.	Biodiversity is the health of ecosystems.	You could check how many plants animals is in your area or you could check how healthy the plants are.	No because most of the things they said was better for the enviroment I was already doing.	Yes because it gets you involved in the activity.
Yes, I enjoyed being part of the project because we can do fun experiments and learn more things about nature.	There wasn't anything I did not enjoy because they made everything interesting and fun.	I think that we could learn more about it because they are much older than us and know more things than us.	Yes there were iPhones to scan codes and it was fun trying to find them	Yes, I liked Inigma because you can draw things in it and it was like a very small computer	It means the number of plants and animals in our area.	I could research on he computer how many different kinds of plant there are or I can just count all the different plants or animal I see.	Yes, I have learnt not to litter and put waste in the water because it could damage our enviroment and pollute the water.	Yes, because you can have fun outside and look at the nature .
The teachers objectives had us thinking about what to do and	I liked every part of the project.	They wanted to help us and at the same time, they were letting us do	I liked the iPod touches. One of my teachers let me use his iPhone	We did not really work with any software as such...	My understanding of biodiversity is a variety of life.	By looking and helped the wildlife around us.	I never littered or such but we did learn that if you do litter it can	There are not many insects in the classroom so that really helped

A	B	C	D	E	F	G	H	I
helped with all the things we did not know about.	fun things and we still learnt about the experience	because my iPod had run out of battery.					harm the local area.	because we saw things we have never seen before.
I did enjoy doing this project as we got to do fun and educational things I also liked seeing different animals	It was a lot more fun working with a high school student	yes I loved using the iphones because we don't normally get to use things like that		there wasn't that much software so no	?	?	yes it has its changed the way i see water and animal or plant life	yes there is because its a lot more fun and interactive
Yes because we learning a few things and did experiments	It was fun working with high schoolers a whole lot of technology	I pods laptops		Paint because you could make funny pictures of experiments	A different species in a different state or area	calculate the species in the area	yes because it explains how to species need other things to survive	Yes because you can study wildlife in sunshine
Yes, i learned about plants, animals and sssssssssssssssss much more and i liked the iphones and taking the videos of my friend and i.	They talked alot and acted all teen drama queen but when they were teaching us they were cool!	iPhone. I liked it because i do not have one at home.		inigma. Because it was really cool how they scanned our tag thingies.	Biodiversity is all things on earth.	the number of plants, animals.	yes, because i get to see the world and the real life not the ones in pictures or movies i mean real life and get fresh air.	
Yes, Because it was intersting and I learned a lot of things which I will remember for life.	Having to wait quietly while the teacher explained what to do. I just wanted to get into the work!	It was interesting how they all were quite nervous with us. I think we were a bit naughty so...	Yes. I loved the codes that you had to scan through the smart phone.	I liked the software that you use to draw and create.	The different species in a place	you could go to a park and make a tally of the things you see.	Not really because most of the stuff that they told us I knew although the new things they taught me wouldn't change the way I look at the environment. That's a good thing!	Yes because you get to experience everything first hand.

A	B	C	D	E	F	G	H	I
 <p>It was fun to use iPhones to learn with.</p>	<p>I did not enjoy some parts because it had just a small bit of waiting in between</p>	<p>It was great to learn with a high school student knowing that they go to school as well</p>	<p>I enjoyed working with iPhones</p>	<p>There was those pieces of paper that you scan with the iPhone and it takes you to a URL and that was interesting to me</p>	<p>biodiversity is the variety of life in the world or in a particular habitat or ecosystem</p>	<p>we could see what different types of animals are around our local area</p>	<p>It helped me be more careful about the environment by realising that it is so easy to pollute water</p>	<p>When you learn outside the classroom it is more exciting and different that just learning in the same old boring classroom everyday.</p>
								

High School Student Post-project Survey

A	B	C	D	E	F	G	H	I	J
Think about your experiences while you were involved in Local Ecostudy Project 2011. Did you enjoy being part of the project? Explain.	Was there anything about the project you DID NOT enjoy? Explain.	Explain what you understand by the term 'biodiversity'.	What are some ways you could measure biodiversity in your local area?	Has being involved in this project changed the kinds of things you do to look after the environment? Explain why or why not.	After being involved in this project do you think there are advantages to learning outside the classroom? Explain why or why not.	Think about how you learn best. Did being involved in this project help you to learn in a different way? Explain why or why not?	Comment on your experiences as a high school mentor for primary students.	Were there any computer devices that you enjoyed working with in the Local Ecostudy Project? Explain.	Was there any software that you enjoyed working with in the Local Ecostudy Project? Explain.
I thoroughly enjoyed the whole thing. I liked how I was the one telling them what to do.	I did not like providing a lot of the equipment. I also did not like getting my hands dirty when disposing the leftover dirt.	The abundance of lifeforms/organi sms in a specific environment.	Catch and recapture method, transects and quadrats.	No. That is because I do not care about the environment that much.	Yes. You can more effectively present information to people who wish to learn and can control a group of kids better.	Yes. My partner kept shouting at my face, which gave me a lot of pressure and this helped me to work because I HAVE to and not because I WANT to.	It made me feel like I had power over other inferior people.	Yes. The iPhone, because it is cool looking, even though it does the exact same thing as any Samsung or Toshiba brand but Steve Jobs makes it look more sexy.	Yes. The QR code system.
Fruthermore, they were an easy bunch of kids to teach, they were not very troublesome in terms of behaviour and intellect.									

A	B	C	D	E	F	G	H	I	J
the project was an enjoyable experience as we were able to gain a better understanding of the topics studied in senior science from teaching what we had learnt to a younger age group.	at times it became a bit frustrating having not already learnt how to use lesson lams however after I got an understanding of how to use it the project became easy	the variety of species in an environment	by looking up the local councils website and finding out what plants live in the local area	not really as I have always liked the environment and found many enjoyable things to participate in within it	yes as it gives a greater understanding of how the things we learn about are involved in our environment	yes as teaching younger individuals made it simpler to understand the information	it was an enjoyable experience and I feel that the primary school students enjoyed the different way of learning just as much as I did	Lesson Lams as it made all the information easier to set out and monitor. iPhones as they made the outdoor activities easier to run	Lesson LAMS as it makes setting out information much easier in an interesting interactive environment
yes. the stuff we were given really benefited the experience creating a good activity that introduced the kids to newer things as well as me personally.	no	biodiversity is a term referring to multiple organisms in a selected ecosystem e.g. a forest national park.	ways in which i could measure biodiversity in my local area is by the special fauna and flora that is around the local area and how other species adapt to that or how they are dependant on certain things	generally no, but the experience did further increase my knowledge of where things end up and what they do if they end up in the wrong areas meaning i appreciate it more	yes, as learning outside provides a brighter area that just increases your thoughts and relaxes me as i learn	as everyone was being fairly treated and everyone was aware of their own topics but after this we became aware of others topics which helped each other	i felt that i was mature and that i felt they could learn from others that were in their situations even though such a long time ago we can relate	all complemented the project great.	none were better than other all just worked for what i needed

A	B	C	D	E	F	G	H	I	J
I did enjoy being part of the program because it made my learning experience a little different and more fun. I was also introduced to more technology such as the nova computers	The only part I didn't enjoy was how long it took to get everything organised and there were often a few technical difficulties which made some lessons a waste.	Biodiversity is the variety of different species of plants, animals etc in a particular habitat or ecosystem.	Some ways to measure biodiversity are by conducting quadrats and transects.	Not really because before the project I wasn't one to litter or ruin the environment by dumping of rubbish or oils etc. I have been more careful in what I put down the sink and drains etc.	Definitely. Learning outside creates a different experience. Its a bit of a novelty so it's exciting and usually more hands on. Also, during a biology topic you can look at plants in real life using examples and showing what your talking about in person rather than in pictures, which helps a lot.	Yes it definitely did. In high school not many classes are done entirely around the use of technology and designing a lesson for younger students so it was exciting. By teaching and explaining to the younger students, the information was repeated over and over in our heads helping us to remember the information more.	It was fun, a different learning experience that really helped the information stick in my head for the exam.	I liked the ipods and all the apps such as inigma. These made it fun for the primary students and was a little different to learn on. I've seen so many around everywhere now and finally know what they are!!	I liked the apps, as I said above ;)
I did enjoy being part of the project because I learnt a lot of new online skills and I love communicating with everyone through edmodo because its easy	No. I liked it all.	The variety of organisms living in a particular ecosystem	quadrats, capture-mark-recapture etc.	Yes because i never knew that the food i put down the sink is effecting the environment. The pollution side of things is what has changed most to me.	Yes because seeing things for yourself allow you to absorb information better	because it was a lot more practical. I usually enjoy sitting down and people telling me information and showing me examples, so this really	it was a great experience to be a role model and a teacher who promoted changing behaviour for the better to improve the environment	i became obsessed with the inigma application. i found it really interesting and exciting when you wait for the page to load. I felt like a check out person at the shops, and	Edmodo because it was easy to communicate with people and was effective too!

A	B	C	D	E	F	G	H	I	J
and effective								that made me feel happy and enjoy what i was doing.	
i did enjoy being a part of the project it was always interesting and fun learning about new technology and also planning out our lessons for the year 5 students	sometimes it got a little boring as i was ahead	biodiversity means the different kinds of organisms in an ecosystem	by using quadrants and transects	not really as i dont really interact with the kind of environment that i was exposed to during this project. otherwise i dont really care about the environment as it goes un noticed to me usually	yes i believe there are many advantages. you are able to put into actions what your teachers have been telling you, also you are able to explore and ask more questions, which would not come to your mind normally Yes, i think learning physically instead of just reading some books are sometimes more effective.	stretched my comfort with learning and forced me to learn in a different way.	it showed me how it would be to be a teacher, and taught me to be a little bit more well prepared. also it taught me new ways to study (not to give up studying until you are confident you can teach somebody else)	the iphone i love iphones	the blog was quiet good it was simple and easy and the end result looked good.
Yes.	Everything was enjoyable.	It is variation of organisms in an ecosystem.	Quadrats, Transects, Capture and Recapture method	Yes, for example, i try to take shower quickly and not waste water.		Yes	Save trees by not wasting your paper.	Yes	Yes

A	B	C	D	E	F	G	H	I	J
Yes, because we could have a learning environment outside of a classroom which was enjoyable	Could have been organised a bit better	Biodiversity is a range of organisms within a selected ecosystem e.g. a forest	Observe, consult the council, ask an expert	Yes because I've realised how many organisms are in one environment and taking small steps can help look after the environment.	Advantages are that it could be more fun and interactive, some different from the conventional classroom teaching environment however some disadvantages could be that kids could get distracted outside with all that is happening.	Yes because whilst we learn from the teacher we also learn from our peers as we share knowledge towards a common goal.	It was a good experience as we got teach kids in a fun and social environment whilst also using technology.	iPhones	Edmodo.

Quality of the mobile learning activities
Using technology
Learning outside