



# MacICT

Macquarie ICT Innovations Centre

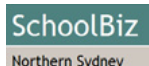
promote innovation • enhance teaching and learning  
• pursue an innovative research agenda

*Exploring and realising the potential of emerging information and communication technologies to transform learning and teaching within a dynamic research community*

# ANNUAL REPORT 2012

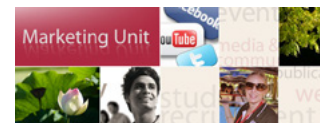


videos - blogs - social media



NSR Computer Coordinators Day  
NSR Leadership Forums

click to see video on  
YouTube



Connected with  
Macquarie University  
Marketing Dep't & DEC  
Media Unit to develop  
a strategy to promote  
MacICT's profile.



Presentations and contributions to innovative events

Blended Learning Conference:  
Improving the student  
experience by merging online,  
face-to-face and mobile  
teaching methodologies

MQ University Lecture  
and Tutorial LEARNING  
WITH GAMES:  
MAKING LEARNING  
IRRESISTIBLE

NSR Computer  
Coordinators Day  
BREAKOUT SESSION

Andrew Church's Connected  
Learning Conference: Student  
design augmented reality  
experiences

NSR GATs conference  
'Unleashing the gifted  
potential' presentation  
LEARNING WITH GAMES:  
MAKING LEARNING  
IRRESISTIBLE

BOS visit of curriculum  
inspectors and project  
officers 4th Sept

The Australian science  
communicators national conference:  
Are computer games and apps the  
new frontiers for communicating  
science?

Visit from Ministry of  
Education, Singapore

Visit by Jacob Kragh  
President of LEGO  
Education worldwide

SMART Teachers Conference:  
Digital Storytelling through games &  
Understanding the next generation and  
how they expect to learn

The Australian e-learning congress:  
Using game design & virtual worlds for  
the creation of interesting and engaging  
learning courses

ACARA  
Technologies curriculum  
and general capabilities  
mapping workshop.  
Computational thinking,  
writing workshop.

Global webinar  
MAKING  
LEARNING  
IRRESISTIBLE



### Sandra Googan

Senior Regional Manager LEGO Education Australia

In 2012 LEGO Education has provided both financial support and expert advice for MacICT's robotics program. Examples include:

1. Covering the cost of experts for workshop development and professional learning events.
2. Providing robotics equipment and resources
3. Connecting MacICT to relevant industry contacts including Apple and the Northern Beaches Business Education Network

**As a result of this critical support MacICT has been able design, develop and run quality robotics programs that reflect current thinking around best practice for the integration of robotics in the classroom.**



### Dean Tuttle

Master Class development & facilitation

Dean has been a key advisor in the design and development of MacICT's Game Design Masterclass. Dean has provided:

1. expert advise on game design, creative thinking process and the design of student activities
2. co-taught the Master Class
3. co-evaluated Master Class and made suggestion for changes

**As a result the Game Design Master Class provides students with a practical, highly engaging learning experience and scaffold to unpack the design process.**



# FIRST®

### Luan Heimlich

FIRST Robotics | Manager for Outreach in Electronic Engineering MQ University

MacICT's collaboration with FIRST Robotics has resulted in a new approach to robotics in the classroom focused on open ended challenges. This approach compliments the competitions run by FIRST at Macquarie University for school students. Luan has also been a facilitator for MacICT's Boot Camps and provided key support for many robotic events.



### Paul Grey | Community Director

Provided expert advice on MacICT's Game Design initiatives. Ran a two hour workshop at MacICT's game based learning teacher workshop.



Ran a two day workshop on Augmented Reality for teachers and Macquarie University staff and students. Has provided MacICT with resource materials to assist our understanding of AR technology.



MacICT to give feedback and become showcase for their learning tools


## Providing opportunities to promote innovative practice in pre-service teachers at Macquarie University

University students are now able to enrol in MacICT's Professional Learning workshops with the opportunity to gain accreditation through the NSW Institute of Teachers.

MacICT provided employment opportunities for exemplary pre-service teachers to work as facilitators of our student Boot Camps, including training in innovative pedagogical approaches.



Robotics & Game Design provide a context for inquiry and discovery, leading students to become active problem solvers and engage in their own learning.

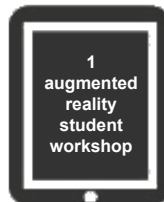
click to see videos on YouTube 



40 Game Design  
Boot Camps  
incl VCs



51 Robotics  
Boot Camps



1  
augmented  
reality  
student  
workshop

Our boot camps give students the opportunity to have the time, space and purpose to **tinker** with systems such as games and robotics, allowing for thought and action to come together, and to build theories. These are critical practices for learning and discovery that have application across all curriculum areas.

Students are able to analyse, manipulate and evaluate information and media, construct knowledge and solve complex problems in individual and collaborative settings.

MacICT identified a key group of **experts** to assist in the development of **teacher and student workshops**. On recommendations from University lecturers, exemplary pre-service teachers were selected and trained as second facilitators for student Boot Camps. Expert teachers were identified to run student Boot Camps and Master Classes as well as teacher Professional Learning.

**Involvement with Game Design Projects:**

Turramurra Community of Schools  
Tweed Heads Community of Schools  
Sydney Region  
School based projects

including VCs, Professional Learning, student Boot Camps and consultation.

*Some Schools requested support to develop projects after attending Boot Camps*

**BRINGING 21ST CENTURY LEARNING SKILLS INTO THE CLASSROOM**

collaboration  
communication  
critical thinking  
creativity & innovation

Enhance **TEACHING & LEARNING**

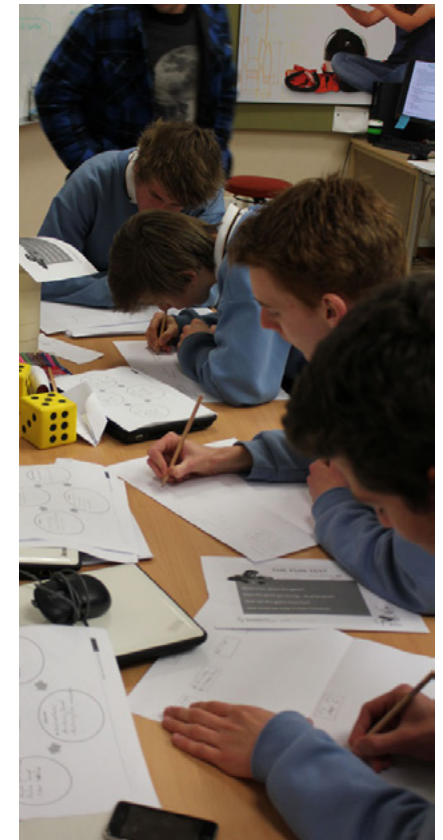


This year MacICT identified the need for a **'Next Step'** Masterclass workshop for students who may already have some experience with Robotics and Game Design. Flexible by nature, these excursions are **tailored** to students' needs.

The full focus of the **Game Design Masterclass** is on unpacking the design process at a deeper level. In particular, providing a scaffold that guides the creative thinking process. In our **Robotics Masterclass** students build on prior programming knowledge, and are introduced to more complex concepts. Students design their own open ended challenges.

**Masterclasses**

- 5 on Robotics
- 6 on Game Design



Enhance **TEACHING & LEARNING**

click to see video on  
YouTube 

HOW WOULD YOU RATE THIS BOOT CAMP?



*"Instead of a great I would call it perfect!"*

### WHAT DID YOU LIKE THE MOST?

“ All tasks were enjoyed, but one most outstanding one was the stages of building the robot. We got to **expand our imagination**, as to how our robot is built, to any shape or form we wanted. There was no limitation or restriction to it, which made it the most enjoyable and fun.

The **DIY experience** and the chance to make your own robot, while being trusted to use expensive equipment.

Completing a **challenge** after I worked really hard.

That it was a **educational** way to learn how to make video games. ”

Making the game with my friend and **exploring** different things and most of all having the most fun that I have had the whole week.



**SOLUTION FLUENCY**



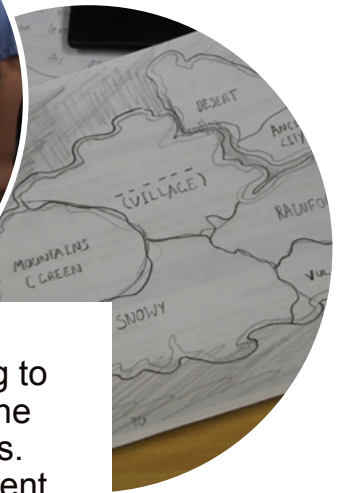
“I liked rebuilding the robot so that it could clear away all the debris and fix any additional problems by using trial and error.”



**CREATIVITY FLUENCY**



“I enjoyed the creativity in getting to create your own robot without the hassle of sticking to instructions. This helped the flow and enjoyment of the day as what you were working on was personalised to your own choice.”



**21ST CENTURY FLUENCIES**

creating digital citizens

**COLLABORATION FLUENCY**



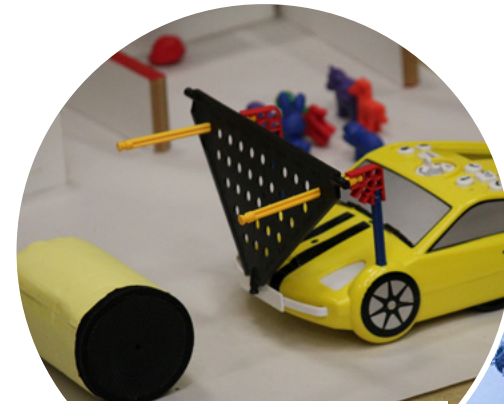
“I enjoyed making my partner, Eve, proud. I like doing teamwork challenges so I pretty much enjoyed all of the day.”



**MEDIA FLUENCY**

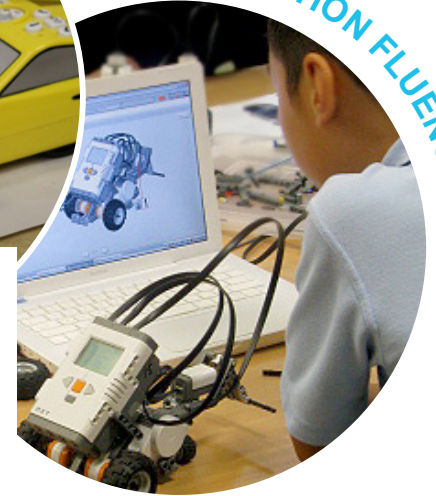


“I enjoyed when we created and shared each others games. Lots of different unique abilities to make interesting games.”



“I liked designing and experimenting with the robots balance when I was constructing it. The logic in it was very great.”

**INFORMATION FLUENCY**



**TEACHER FEEDBACK**

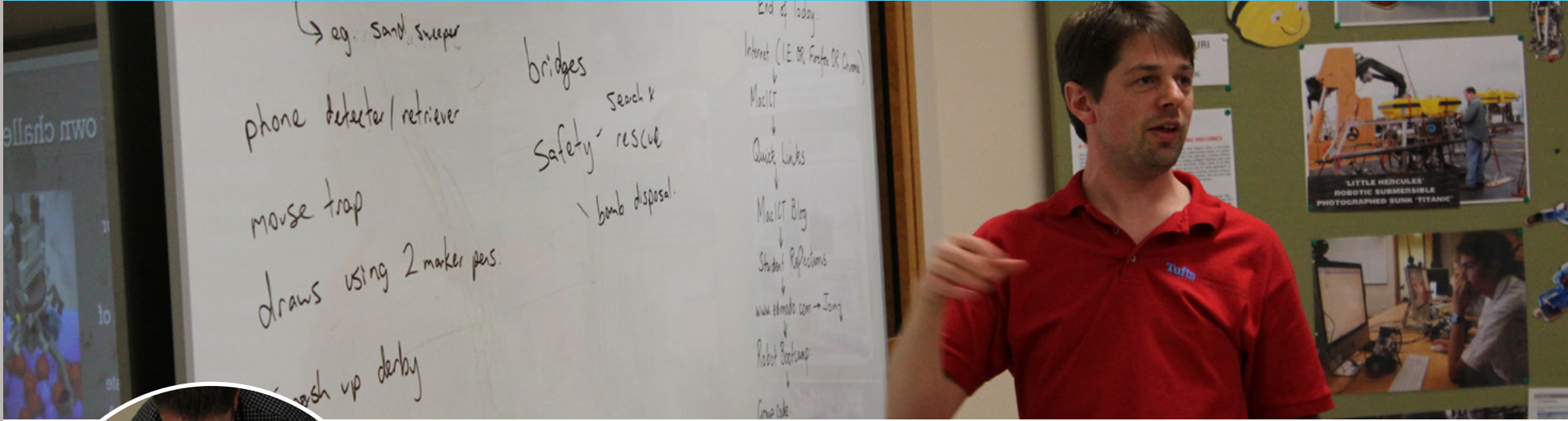
“Great in bringing me up to speed, showing me the links to the **curriculum.**”

“I feel like **crying from joy**, to see the students so engaged. This is what they need”

“The timing of a workshop on game design using Kodu was perfect for the new DERs. Thorough workshop that went through the whole process. Feel **very equipped** to take this back to school”

“**Fabulous.** Able to get through a great deal of instruction and hands-on in one day!”





Enhance TEACHING & LEARNING



### Robotics in the Classroom (Bee-Bot & Pro-bot / LEGO NXT)

These full day workshops are accredited by the NSW Institute of Teachers to give an overview for beginners on the use of robotics in the classroom.

*Iterative design process | Face-to-face workshops | Staff development day workshop tailored to Schools' needs*

**32**  
participants



### Good Game Design

These full day workshops are accredited by the NSW Institute of Teachers to give an overview for beginners on Good Game Design principles.

*Iterative design process | Face-to-face workshops | VC workshops | New 'Learning with Games' workshop | Staff development day workshop tailored to Schools' needs*

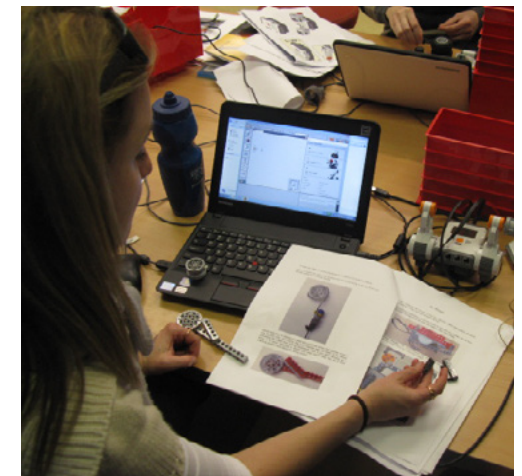
**75**  
participants



### LEGO NXT Robotics in the Classroom with Barbara Bratzel 15 August

Barbara Bratzel is a consulting teacher at the **Centre for Engineering Education Outreach** at Tufts University, she is also a respected science teacher and author on robotics in the classroom. MacICT ran a professional learning event in collaboration with LEGO Education who brought Barbara to Australia. The day featured a keynote by Barbara and two teacher presentations outlining the way they integrated robotics into their classrooms. Participants then joined a beginner or advanced hands-on LEGO NXT workshop. Concurrently, FIRST Robotics ran a student workshop on Labview, a more advanced programming language.

**39**  
**participants**  
from 5 regions including  
**2 pre-service teachers**





### Disrupting School: Learning in the 21st Century 19 July

A professional learning day featuring Dr Alec Couros, Professor of EdTech and Media, Faculty of Education, University of Regina. The day covered:

- **Becoming a Networked Learner**
- **Understanding Digital Citizenship & Identity**
- **Introduction to Digital Story Telling**



### Connected Learning & Leadership Workshops 10 August

The 21st century fluencies of solution, information, collaboration, creativity and media are essential for living in this digital world. Social media allows educators to connect in ways that were never before possible, providing us with opportunities to facilitate the development of these fluencies both in ourselves and in our students. MacICT ran two sessions on:

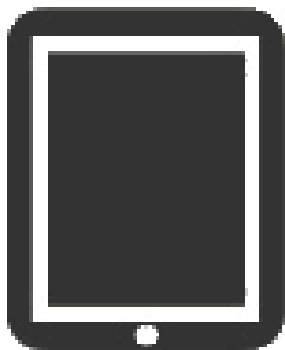
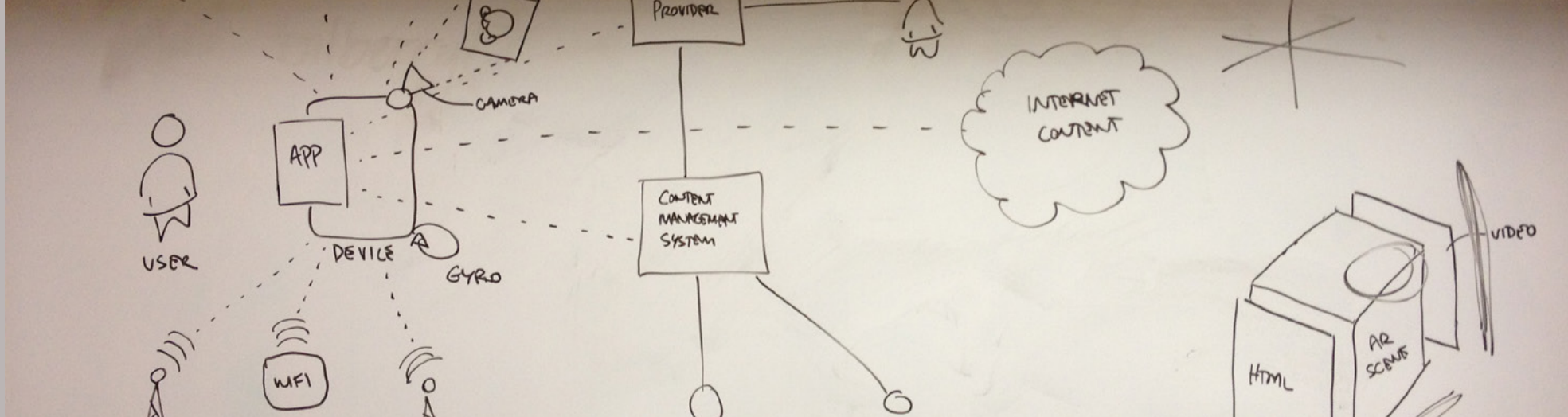
- **The Networked Educational Leader**  
led by George Couros, Division Principal of Innovative Teaching and Learning with Parklands School Division
- **Social Media Tools for Innovative Teaching, Learning & Professional Development**  
led by Dr Alec Couros

**62**  
**participants**

from 38 schools

**35**  
**participants**

from 22 schools



### Augmented Reality Workshops 14th August, 11 September

MacICT together with the Macquarie University Learning Technology Research Cluster organised two Augmented Reality Workshops run by Rob Manson & Alex Young from **buildAR** and Ast. Prof. Danny Munnerley & Matt Bacon) from the **Inspire Centre** at Canberra University.

Augmented Reality (AR) is a new wave of technology that allows people to create and view information layers on top of our everyday world. For instance, by waving your mobile phone in front of a picture in an art gallery, the picture can come to life with text explanations, pictures of related works, or video commentary. Augmented Reality is poised to transform our everyday life, and particularly the way we learn.

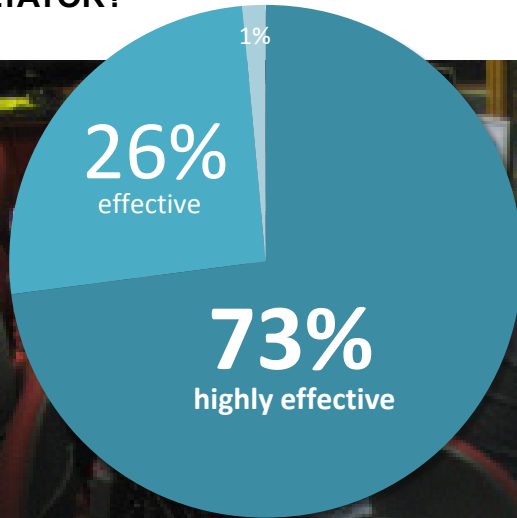
The workshops covered:

- Overview of AR and its history
- Conceptual unpacking of AR tools
- Creating an AR learning activity
- Considering how AR can be used to enhance learning
- Design thinking process
- Collaborative design
- Reflecting on the potential of AR

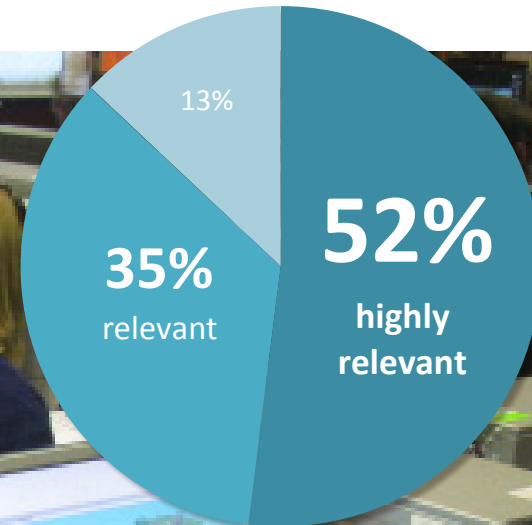
**30**  
**participants**

**over 2 days**

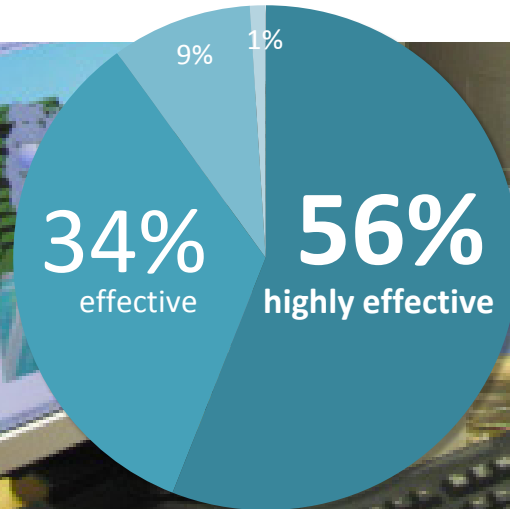
HOW EFFECTIVE WAS THE EVENT FACILTATOR?



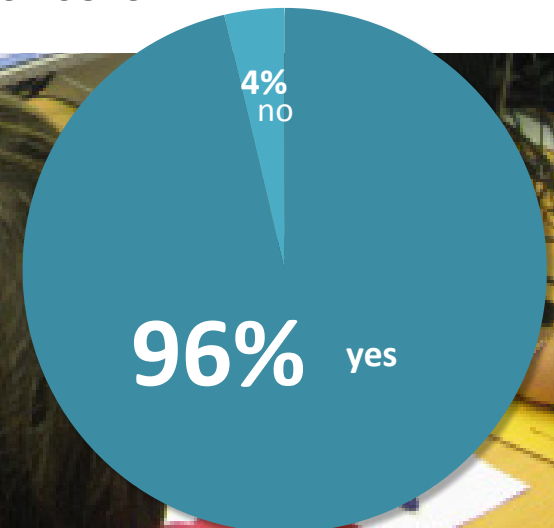
HOW RELEVANT WAS THIS EVENT TO YOUR ROLE?



HOW EFFECTIVE WAS THE EVENT IN ENHANCING YOUR UNDERSTANDING OF THE CONTENT?



WERE THE IDENTIFIED PROFESSIONAL TEACHING STANDARDS APPROPRIATELY ADDRESSED THROUGH THIS COURSE?





## Teacher feedback

### What did you like most about the event?

“The chance to play and be guided where necessary. Being in the “student” situation gives one a important insight into what to do and how far it can go!”

“The structure - relevance to students learning was explained in the beginning, then plenty of time to explore! Thank you for the additional resources on Edmodo.”

“The passion and enthusiasm of Cathie Howe is infectious.”

“Right balance between hands on/scaffolding and info.”

“The presentation of new ideas for the use of robotics in teaching. The opportunity to network with other teachers.”

“The practical suggestions for using technology and the questions posed in regards to implications of social networking.”

“Relaxed atmosphere and real life experiences.”

“The practicality. We actually got time to use the equipment.”

“I liked the way it made me think from a different perspective about ICT and the creation of learning communities.”

“The presentation was inspiring and it opened my mind and thinking.”

“I liked the broad coverage of an endless topic. How do we best use technology to enhance learning?”

**At 52%, the most common thing that participants liked about MacICT’s events was the ‘hands-on learning’ approach.**

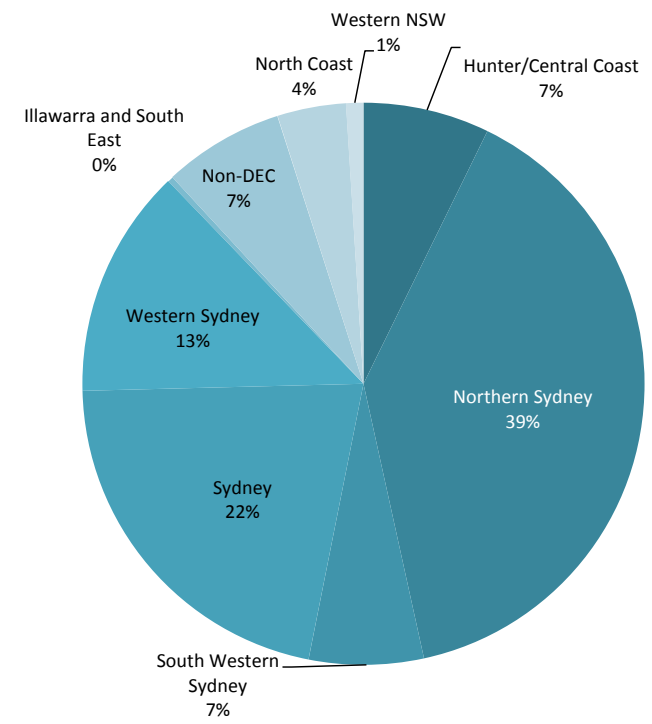
**When asked what could be improved, 35% of teachers responed that they couldn’t think of anything. 29% of teachers requested ‘more time’ then ‘more links to the curriculum’ coming in at 10%.**

# Activity overview 2012

2538  
students

229  
unique teachers

141  
unique schools



Enhance TEACHING & LEARNING



Many schools are considering introducing iPads into their classrooms. In Term 3, 2012, Macquarie ICT Innovation Centre (MacICT) conducted a small case study to explore how Year One students and teachers might make use of iPads in their classrooms.

Can teachers support and strengthen young students' ability to work mathematically and build their mathematical competence through the use of educational apps on an iPad?

2 schools      85 students      4 teachers      5 weeks

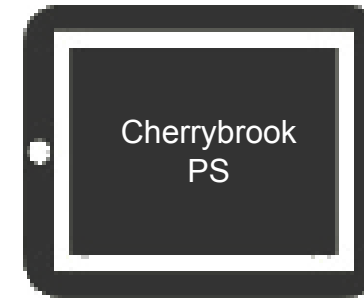
Project Team: Cathie Howe, Nerida McCredie

## Findings

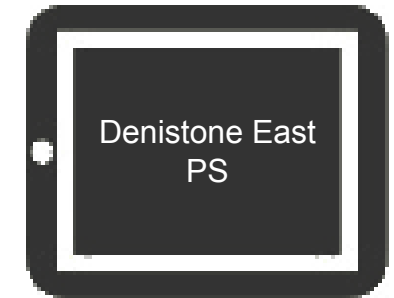
### 1) Using Specifically Selected Apps

When they made use of content specific apps, the Teaching Team identified that:

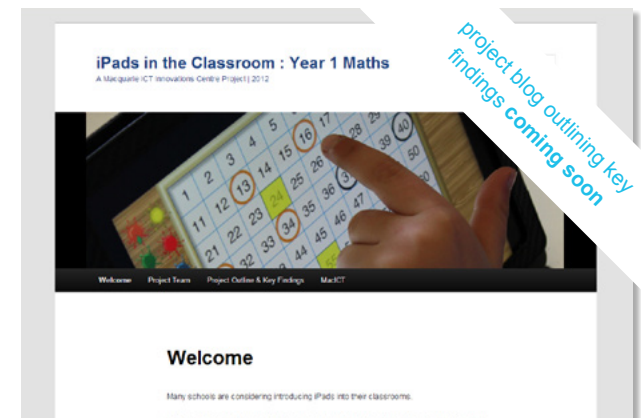
- Children who had expressed a dislike of maths **enjoyed learning** using apps on the iPads
- They had greater confidence that all students were engaged and **participating** during the activity
- Apps could allow for each student to work at the appropriate level while providing the **opportunity** for them to progress to the next level when they wish
- The apps could be used as “**conversation starters**” between partners, or for valuable class discussions about mathematical concepts and strategies



Cherrybrook  
PS



Denistone East  
PS



## TEACHER FEEDBACK



“I had a division lesson where we were using the Lady Beetle app. Two of my weaker students were debating whether it was a **fair share**. This never would have happened in to **“normal” lesson.**”

“It was special to see the **excitement and joy** on the faces of some children that are usually quite shy and reserved and dread the thought of doing maths.”



“The iPads allowed children to work to their **individual capability** while pushing themselves in a safe environment. Once they were shown how to use an app and they became comfortable with it, they would progress to **the next level** if they felt confident.”



“Most of the games based apps were of excellent for reinforcing concepts that had already been taught. Students began using **mathematical language** to discuss their **strategies** at the conclusion of the lessons.”

“It was much **easier** to spend time with a student asking him or her to explain a maths process when the rest of the class were engrossed in their iPads rather than them sitting in front of a **text book.**”



## Findings continued...

### 2) Designing and Creating with iPads

When students were involved in tasks that made use of the camera, microphone and a design app, the Teaching Team identified that:

- Providing students with a design task using an iPad promoted **discussion and reasoning** as they work together to create a response
- iPads enabled students to **design 'on the go.'** Young children could easily master design apps and the iPad's camera and microphone to creatively capture their ideas
- **Showcasing and sharing** the students' design projects encouraged quality responses
- Using video and voice recording, along with screen capture features could help students demonstrate ideas that they might not be able to **articulate**
- Observing students working with iPads and carefully examining their design tasks provided teachers with new ways of **gaining insights** into their students thoughts, strategies and mathematical abilities

click to see videos on  
YouTube 

## TEACHER FEEDBACK



“Students worked well in pairs and used mathematical language using the apps that **recorded their thinking**. Because the students knew they would be played back in front of the class, they all put in their best efforts and really put thought into the questions they asked their partners as well as their responses.”

“The iPads helped me discover the **reasoning** side of their working mathematical abilities. This is a side of my children I had never or **rarely seen**.”



“Since starting the study, Year One students are all using mathematical language to question and communicate with each other **on a regular basis**. I was inspired by the level of reasoning and talk coming from our students and we are regularly discussing the **different strategies** we have used. Any of the apps that used screen capture and the camera tool were excellent at **evoking quality mathematical questioning and reasoning** from my students.”



“Kindergarten borrowed the iPads outside and took photos, then went in and edited them using ‘Explain Everything’ and recorded their findings. These students couldn’t necessarily write this concept down but by using this app and recording their drawings and voice they were able to **explain the concept**.”

“When given free time two students found the drawing app, and made up number sentences **of their own**, which they then took turns answering.”

For the past few years, the NMC Horizon Report has discussed the potential of Augmented Reality (AR) for learning but has noted there is a lack of school based examples of its use. MacICT decided to conduct a small, innovative school based AR project during Term 4, 2012 to provide insight into its potential value for education. The project's focus was upon the students, their values and interests, the nature of their learning experience and their appraisal of the transformative potential of AR.

Can we uncover the insights students' have into the potential value of Augmented Reality for learning by casting them as e-Design Artists?

1 school      16 students      2 teachers      5 days

Project Team: Cathie Howe, Nerida McCredie

## Findings

An initial examination of our project documentation suggests the students involved in this project successfully took on the role of an e-Design Artist. They demonstrated a deep level of appreciation for the artworks and created wide ranging, well considered, media rich responses.

The project indicates that students do have insights into the potential of AR for learning. The students involved in the project perceive that learning with Augmented Reality has the potential to provide:

### Learning opportunities that are both individual and personal

The students shared their belief that AR is an *individual technology*. It allows the learner to *be a part of what you are learning about*. Learning with AR can make



click to see video on  
YouTube





*it real – you’re not just sitting there and watching, you’re actually doing something, not taking notes on how to do it. Moreover, in AR learners can experiment more, make mistakes and redo it, following their own line of inquiry. When learning uses AR there is the potential see alternatives, to consider your options and the chance to explore your own choices, not pre-set choices.*

**Learning experiences that aren’t offered (or are readily available) in reality.**

AR can add a layer of accessibility and enjoyment. One example the students discussed was the possibility of *doing stuff that you wouldn’t be able to do in a chemistry lab at school* like creating virtual explosions or breaking apart igneous rocks, of being able to *be in control* and have access to a reality where you could cause no real harm. In such a learning environment, the students suggest they might be *more inclined to try new things* and that they *would constantly be imagining new ideas.*

**Challenging and authentic design based learning tasks.**

Designing Augmented Reality auras for the sculpture park at Macquarie University was challenging for our students, however they found that such a challenge *makes you want to go in depth.* Their creative responses were going to be shared with the public and this was of value to them - *we are more excited about our own ideas instead of a textbook answer.* Such a task was *not like a worksheet where everyone has done it and it’s nothing special.* Instead, they were able to *think differently and have ‘their’ own perspective.* They appreciated when you design and create with AR, *you can share it and be proud of it.* The students reported that this made them feel that *you’re the clever one.* They reported that a task such as this *is so much more satisfying.* One student commented that *the AR project has helped me to think deeply about technology.*

*\*Italics indicate student quotes*

Pursue an **INNOVATIVE**  
**RESEARCH AGENDA**



## STUDENT FEEDBACK



### How is AR better than the system we have at the moment?

“I think it will make learning easier. I myself, I really **can't learn from a textbook** but when you give me a video and I can listen, I can learn a lot quicker. So I think, over the layer of accessibility and enjoyment, it also helps improve your learning.”



“It is so futuristic that kids will **actually want to use it**. If you just wanted to look at a video on the screen, we have been doing that for ages and you see that and go, oh not just another video and then you get this interactive way of learning and it is infinitely more enjoyable and people will want to more like want to do it.”

“It's **our personal experience** of something, it's not just a whole class watching a video of something where most of them would probably be distracted doing something else. (With AR) You have to keep doing something, not like watching a DVD where you are just sitting there. You have to scan it and you can't get distracted.”



### What value did you find in you yourself doing the creation and not the teachers?

“You felt like you were clever. Often you've got the teachers doing it and they make it seem easy and then you try it and it is not that easy but when you do it first, you seem like **you are in control**, and that you're the clever one”

# Pursue an INNOVATIVE RESEARCH AGENDA



“It (AR) changes a lot because if you read a text it has to be spot on, that’s what it is. But if you do it yourself, it gives you your own imagination and you can think differently and have your **own perspective**.”

“I would definitely like to make my own (AR experience). Making an actual project is good. Often in class we don’t have actual projects, we just have work everyday but we don’t have something we continue throughout the whole theme and you are still learning but this is more **motivating**.”

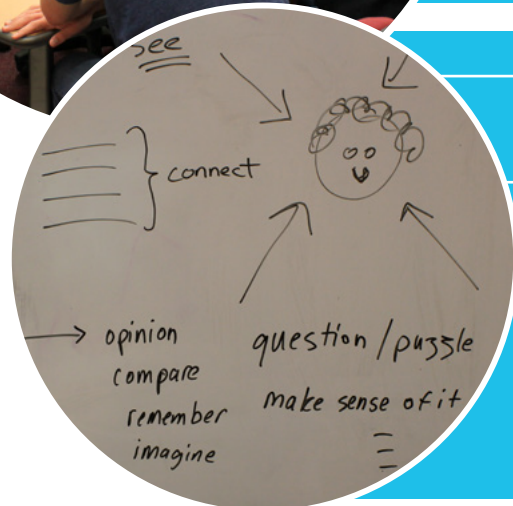
“You can keep it, it is not like a worksheet which you would throw away it is like an actual proper, not a piece of art but along those lines – a product. You can **share it and be proud of it**. Not like a worksheet where everyone has done it and it’s nothing special.”

“It’s more exciting.” “You have your **own choices** instead of having preset choices.” “You are not just sitting there and watching, you are actually doing something and you are not like, taking notes on how to do it.”

“We are learning lots of things, we are learning the technology and we are learning the information. It is **efficient learning**. And we know how to use the technology in the future.”



What are your ideas of using AR in other areas?  
How could AR change some other lessons?



“In Society, not just in the classroom, even around the world anywhere, there could be links where the people could just look at it wherever they are and **learn wherever they are**. So they can learn when they want. You don’t have to be within a certain class or anything.”



“Different people learn in **different ways** – this is another one. Especially now that technology is becoming more advanced and many people are using it. Technology would be a better way to learn because that is **what they are growing up with**, like in our age group”

### Written reflections



“AR is efficient, creative, educational, exciting and **everybody** can take part”

“It is important to give AR to the students and not just the teachers because it’s a very hands-on and **individual technology**”

“It is exciting and new and allows you to be **a part of** what you’re learning about”

“AR would improve a child’s brain capacity because they would constantly be **imagining new ideas**”



“Nowadays, we’ve had “interactive” classrooms for a few years, where teachers, instead of using paper, attempt to engage the class by using technology, but now that’s just become a part of everyday life, and is hardly anything special anymore. So, textbooks, from the past don’t work well, “smartboards” from the present don’t work too well anymore either. So we just need **something from the future**. That is where AR can come into play. (AR) has endless applications in the education world, but most importantly, it’s relatively cheap, and it is so simple to use. Kids are easily able to pick up a device, and instantly be introduced to a new and super interactive learning experience.”

Based on feedback received from the workshops and events run in 2012, MacICT has identified a keen interest from teachers and educators in further professional development around connected learning in the 21st century, and robotics in the classroom. Dr Couros and Barbara Braztel have accepted MacICT's invitation to be involved in further professional learning activities in 2013.



With the launch of the Australian Curriculum 2014, MacICT is working towards extending our reach to a national audience. To address the need for professional learning in regional areas we are looking at running Adobe Connect sessions with experts such as Barbara Bratzel.

NEW

Professional Learning Workshops in 2013

Creating digital content on the iPad

Augmented Reality

Transmedia Storytelling

WeDo Robot for K-2

Developing Personal Learning Networks (PLNs)

Partnerships & collaborations in 2013

All MacICT's current partnerships and collaborations will continue to develop and grow in 2013.



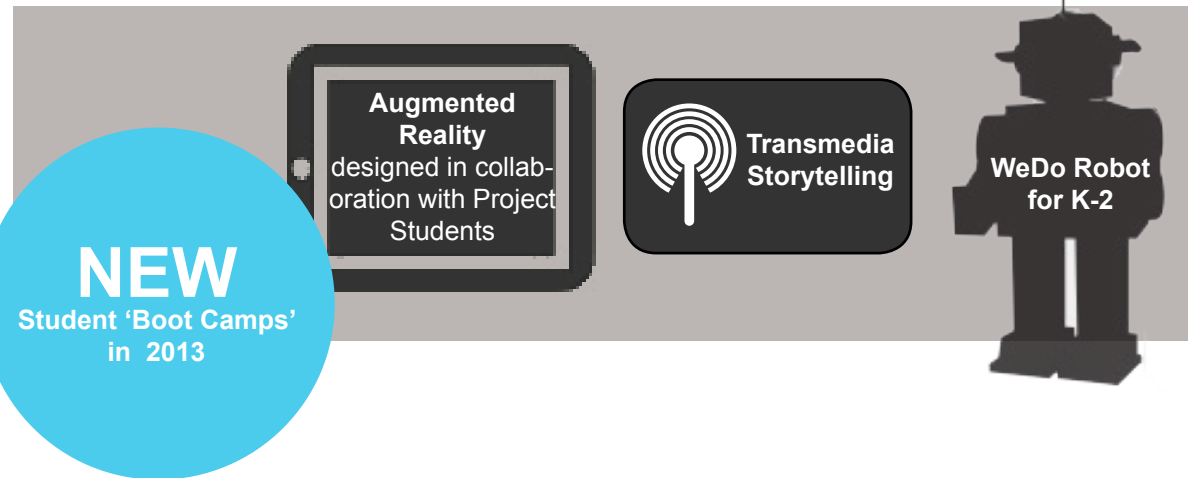
MacICT will deliver Professional Learning workshops and student Boot Camps via the Connected Classroom to low socio-economic schools as part of the Bridges Connect project.

*"I look forward to continually working with Cathie Howe on new ideas, projects, and adventures in years to come"*

Paul Grey, Bubblegum Interactive

The student 'Boot Camp' model has proven very popular in 2012. MacICT are committed to an iterative design process for all our workshops and these student excursions will be updated to reflect both feedback we've received and new technologies that develop.

MacICT will continue the model of facilitator run workshops for students and expand its program to include Augmented Reality, Transmedia Storytelling, and K-2 WeDo robotics. To support the launch of 'The Satellite Games' in Term 3 2013 MacICT will run Boot Camps aimed at providing guidance and support to schools wanting to be involved.



MacICT is proud to present...

## INVASION OF THE SHADOW PLAGUE

This online interactive meta-game was created by MacICT to introduce students to Good Game Design principles through Kodu Game Lab. The website was developed by Macquarie University students as part of the Participation & Community Engagement Partnership (PACE) agreement.



FUTURE PLANS

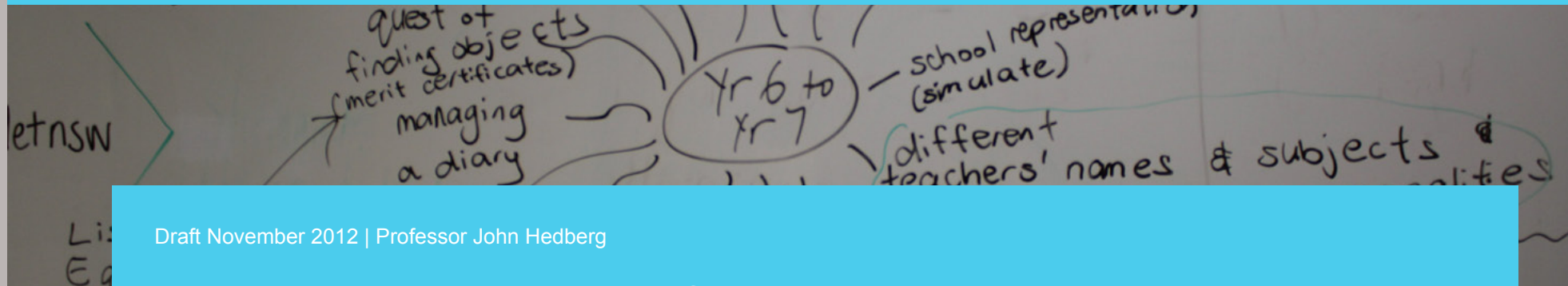
**4**  
days

Game Jam  
Transmedia Storytelling  
Robotics Showcase  
Festival Day

**A celebration of creativity and innovation in Australian contemporary education.**

Hosted at Macquarie University in Term 3 2013, the events that make up The Satellite Games will showcase the work of K-12 students around NSW. Student teams have the opportunity to participate in one or more of the games events.





Draft November 2012 | Professor John Hedberg

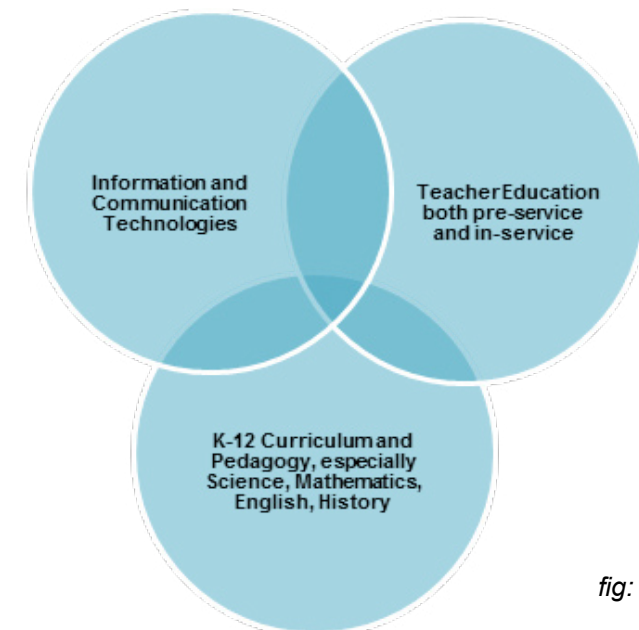
## Developing a research and professional practice agenda for Macquarie ICT Innovations Centre

*Macquarie ICT Innovations Centre is a partnership with the NSW Department of Education and Communities through the North Sydney regional Directorate. It is a partnership that focuses upon evidence-based practice and professional learning for teachers and their students. The projects supported by the Centre all explore modern pedagogy employing the latest appropriate technologies and often pre-service teachers are encouraged to work within projects to provide intensive support for teachers learning about new software and systems.*

Going forward, the Centre needs to establish its unique research agenda and framework to review evidence-based practice. With the arrival of a new professor in the School of Education for whom Teacher Education is a major research agenda, and with the established links between the formal programs of the School of Education and the K-12 focus of the teacher and student learning of the Centre, it is possible to suggest that the focus should include three key elements (*fig: a*).

### The core research agenda

The research focuses on links between the School curriculum, the preparation of teachers who understand the new Australian Curriculum and how this new curriculum requires new pedagogies that assume and subsume



*fig: a*



the role of technologies. The approach depends on the pedagogy of the discipline in a world where processing discipline knowledge depends on access to and understanding of the enabling technologies. Given the changing choices of teachers and their principals, as part of this implementation process, the dependence on external technology expertise needs to be minimised and instead the focus is on interaction and the networks that facilitate learners' understanding and maximises local control over choice of tools and enabling applications.

Several principles might underpin the choice of projects and a research development strategy that is driven by teacher and student desire to focus on 21st century skill development. Thus it is suggested that some of the framing principles might include:

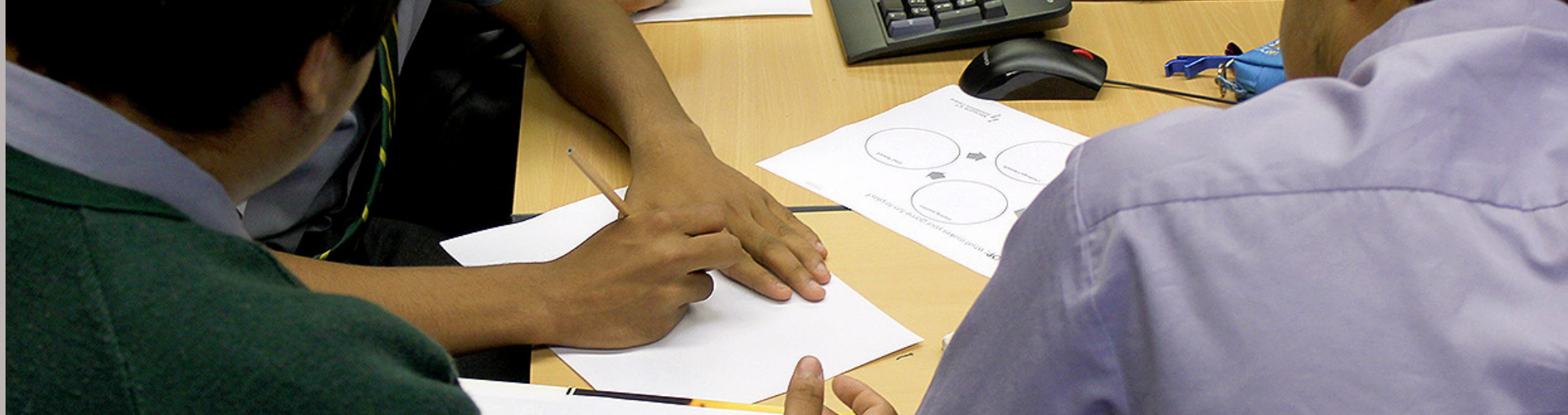
1. All projects seek to explore pedagogies that are situated in discipline knowledge.
2. Projects should focus on higher order learning outcomes such as analysis, evaluation and creation of responses.
3. Projects should explore new research methodologies

such as design research, where teachers, students, school leaders together with the researchers design new strategies and collect evidence on their effectiveness.

4. Work with whole of school strategy that underpins school decision making and choices for funding, noting particularly, the climate and environment to sharing and deployment of appropriate technologies.
5. Projects should foster sustained partnerships between researchers, schools, teachers and school leaders.
6. 6. Projects should enmesh tools such as knowledge processes that support the collection, mixing, collaboration, creation and sharing, through smart and mobile tools.
7. Projects should involve a sense of fun

### **Possible development strategy**

Over the next three years, to follow models across the university such as the Macquarie Astronomy, Astrophysics and Astrophotonics Research Centre (MQAAARC) and Macquarie University Special Education Centre (MUSEC) to develop research groups around strong researchers



with international reputations. This will mean strategies will employ:

1. Gaining funding through Sponsored research
2. Working closely with highly regarded discipline specialists, in areas such as Astronomy, History, and collaborative creation of texts (in the multi-literacies definition)
3. Seeking some national competitive funding possibly more through linkage than discovery projects
4. Sourcing developmental funding through MQ university schemes such as application for formal Centre status by Faculty and University.
5. Seeking links with similar research groups in Asia, Europe and North America, possibly generating potential co-tutelle collaborations.
6. Seeking funding with international groups that support collaboration and sharing of learning resources

## **MacICT will both initiate and be involved in a variety of projects in 2013**

- Identify authentic opportunities for AR project both within and outside Macquarie University
- Seek confirmation of findings from the 2012 iPad project
- Explore the use of iPads in science and literacy, learning support including special needs and GATS



Draft November 2012

## Australian Curriculum Project Connected Communities 21

### PROJECT AIM

Directors, expert leaders, School Development Officers and academics from Macquarie University work with school leadership teams, teachers and their students to develop and evaluate evidence-based implementation strategies for 21st century learning.

### PROJECT SCOPE

*School Principals and project leaders participate in research and work collaboratively with the Australian curriculum project team to collect baseline and final data, implement and share a local school plan for implementation and participate in ongoing team sessions and feedback to school leaders on key drivers of successful change.*

From the literary review conducted, three possible areas of investigation were highlighted. These include:

1. Research that critically examines the relationships associated with the effective use of technology by teachers and learners in Australian F-12 schools. Such research responds to the following contextual drivers:

- There is rapid change in the technologies we use daily and access to these technologies is increasing.
- There is a current drive for education reform embodied in the proposed national curriculum and desired for the enacted curriculum in the classroom.

In investigating these areas, current instances of best practice that respond to the changing requirements of global citizenship and sustainability articulated in the literature need to be identified and examined more closely. Finally, such research needs to explore possible frameworks for transforming technology use in order to more effectively develop the skills learners need in the twenty-first century.

2. How to re-align priorities and consider how knowledge is constructed through the technology-mediated situated learning for both educators and students.
3. How having teachers as researchers impacts on the effective use of technologies in schools.

## Project Timeline

Date	Task
Term 4 2012 - asap	Expression of interest advertised in Schoolbiz – Principal and School Leader commitment – Funding to 6 primary and 6 secondary schools
Term 4 2012	Panel – John Hedberg, Dail McGilchrist, Meredith Ash– select and contact successful schools
Term 4 2012	Scope of research and research questions developed – John Hedberg
Term 4 2012	Funds provided to schools
Term 1 2013 – Week 3	<p>Launch of Australian Curriculum – Connected Communities 21 Project</p> <p>Students and staff from North Sydney Girls High School and Neutral Bay Public School present on 21st century learning programs in schools and Principal of North Sydney Demonstration School presents on Charter of Professional Learning and using current research to drive change.</p> <p>Overview and planning for 2013 – Local schools Local decisions Local plans</p>
Term 1 2013	Baseline data collected
Term 1 2013	2 Directors coach primary and secondary Principals as differentiated school action plans developed
Term 1 2013 – Week 5	Connected Community meeting – school action plans shared.
Term 1 2013	Consultants provide in school support
Term 1 2013 – Week 10	2 Directors (primary/Secondary) facilitate learning conversations for school Principals and leaders – schools develop schedules to visit other schools in Term 2
Term 2 2013	Connected communities visits – video clips of learning journey
Term 2 2013	2 Directors continue to coach primary and secondary Principals – video clip of a primary and secondary coaching session
Term 2 2103	Consultants provide in school support – video student learning in the classroom
Term 2 2013	Project data collected
Term 2 2013 - Week 10	Australian Curriculum – Connected Communities 21 showcase for project teams
Term 3 2013	Leaders Forum - Australian Curriculum – Connected Communities 21 share
Term 3 2013	Research paper sharing local decisions of school leaders indicating key drivers of success
Term 3/4 2013	Principals and leaders in Connected Communities 21 Project mentor other colleagues across the state.