Edith Cowan University
School of Education

School of Education Twilight Seminar
11 &15 February 2016

Australian Technologies Curriculum:
Technologies and coding in schools
Dr Jenny Lane
Co-director Centre for Higher
Education Teaching and Learning

Edith Cowan University
School of Education

ECU Twilight Seminar

Welcome to ECU

A/Professor Geoff Lummis

Deputy Director Edith Cowan
Institute for Education Research

Edith Cowan University
School of Education

Dr Jenny Lane

My research
Big questions
- 1. Why should we teach students to code?
- 2. What should we be teaching?
- 3. How can I promote technologies in my school?
- 4. How do we involve girls and reluctant students?

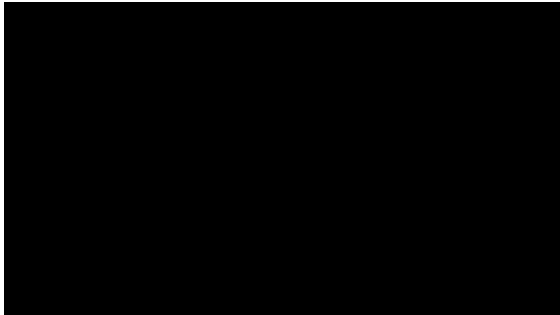**Edith Cowan University**
School of Education

ECU

Questions

- 5. How do we support students who may know more than the teacher?
- 6. How do we avoid too much screen time?
- 7. Where do I start?
- 8. How can I learn more about this area?
- 9. Conclusion and questions

Edith Cowan University
School of Education

ECU

Technology in Action - YICTE

Edith Cowan University
School of Education

ECU

Dr Jenny Lane

- 1. Why should we teach students to code?
- Creating preferred futures
- **Thinking is central**
- Design thinking- Design and technology
- Computational Thinking- digital technology
- Systems Thinking
- Creative/ Critical Thinking skills
- Project Management

Edith Cowan University
School of Education

ECU
AUSTRALIA
EDITH COWAN
UNIVERSITY

Digital Technologies

- **Key concepts**
- **Abstraction** – cognitive skill- computational thinking- problem solving
- **Data**- data collection, data representation
- Data interpretation- patterns, contexts
- Specification, algorithms, implementation – algorithms how systems work
- Implementation -Programming

Digital Technologies and Design and Technology

Ideas for teaching digital technologies

Edith Cowan University
School of Education

ECU
AUSTRALIA
EDITH COWAN
UNIVERSITY

How to start coding

Edith Cowan University
School of Education

ECU

2. What do we need to teach?

- Mandy Hudson
- **School Curriculum and Standards Authority WA**
- mandy.hudson@scsa.wa.edu.au
- WA SYLLABUS
- http://k10outline.scsa.wa.edu.au

Edith Cowan University
School of Education

ECU

3.How can I promote technologies in my school?

Lauren Cameo
DIGITAL CAREERS
- SA & WA State Manager
- lauren.cameo@nicta.com.au

digitalcareers

Digital Careers

Lauren Cameo
SA & WA State Manager
lauren.cameo@nicta.com.au
11.2.2016

An Australian Government Initiative
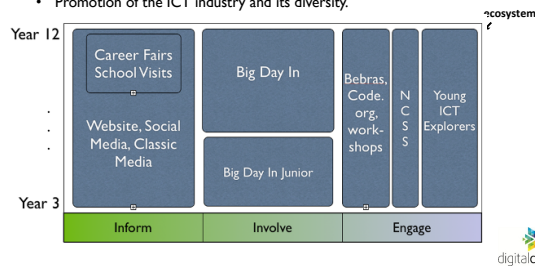
About Digital Careers

- National Program addressing issue of primary & secondary students' declining interest in ICT careers.
- Reach (2014): 200,000+ students (8-17 years).
- Influencing the influencers & connecting the value chain.
- Active in every state and territory of Australia.
- Network of supporters, including Commonwealth and Australian state governments, industry, primary/secondary/tertiary sector, ...
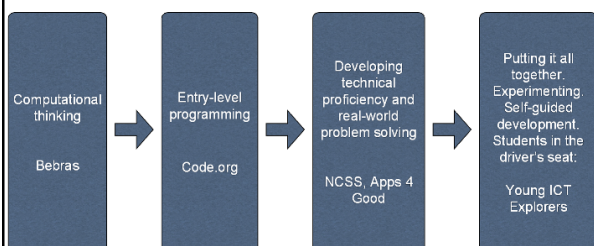
Digital Careers Approach

- Emotional & factual connectedness: Activities & Events for Students.
- Teacher Engagement & Professional Development
- Promotion of the ICT industry and its diversity.

Year 12

Career Fairs School Visits	Big Day In	Bebras, Code.org, work-shops	N C S S	Young ICT Explorers
Website, Social Media, Classic Media	Big Day In Junior			

Year 3

Inform	Involve	Engage

Engaging the Students, Connecting the Ecosystem

Computational thinking

Bebras

→

Entry-level programming

Code.org

→

Developing technical proficiency and real-world problem solving

NCSS, Apps 4 Good

→

Putting it all together. Experimenting. Self-guided development. Students in the driver's seat:

Young ICT Explorers

digitalcareers

Bebras Australia Computational Thinking Challenge

First 2016 round coming up in March!

www.bebras.edu.au

Professional Development for Teachers

- MOOC
  - Digital Technologies: Implementing the Australian Curriculum Learning Area (K-6)
  - Digital Technologies: Next Steps (Years 7 & 8)
  - ICT in Primary Education – Transforming children's learning across the curriculum.
- CSIROs ICT in Schools
- Tailored programs
  - Programming with Ozobots
  - Computational thinking
  - Data within curriculum
  - Others as required
    Talk to us about your requirements!
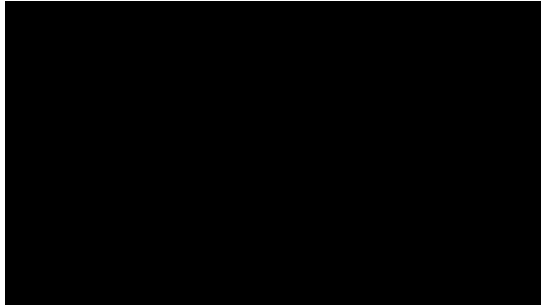
digitalcareers

Further Information

- www.digitacareers.edu.au
- www.bebras.edu.au
- www.youngictexplorers.net.au
- www.scientistsinschools.edu.au/ICT
- www.acsfoundation.com.au/bdi

digitalcareers

4.How do we involve girls and reluctant students?

Edith Cowan University
School of Education

ECU
AUSTRALIA
EDITH COWAN
UNIVERSITY

5.How do we involve students who may know more than the teacher?

- Travis Joy
- Young ICT Explorers

YOUNG ICT Explorers 2016

SAP

Young ICT Explorers

Young ICT Explorers is a non-profit technology competition for Primary and High School students initiated by SAP in partnership with Digital Careers, our University partners, Edith Cowan University (E.C.U) the University of Queensland (UQ), The University of NSW (UNSW) Australia National University (ANU), Deakin, James Cook University (JCU) and the University of Tasmania (UTAS) along with industry partners. With the aim of fostering innovation and collaboration amongst school students.

Young ICT Explorers

YICTE is open to students in years 3 to 12 in Australia and now New Zealand.
Our goal is to encourage and inspire school students to use their creativity and innovation skills to gain a greater understanding of the diverse possibilities available to them through today's technology.

Brisbane-Sydney-Melbourne-Canberra-Hobart-Perth- Townsville-Adelaide-Auckland

Year group grade divisions
3 - 4
5 - 6
7 - 8
9 - 10
11 - 12

Young ICT Explorers

We have kept the scope of the competition broad to encourage as much STEM creativity as possible through the use of ICT. We don't want to limit possibilities for projects that are new and unheard of before. We welcome all types of projects providing they have a clear link to ICT.

Young ICT Explorers

Students can compete individually or in teams of up to four. Schools can register the teams interest online through our website, you have until the **31ˢᵗ of May** to register.

www.youngictexplorers.net.au

You then have until the **1ˢᵗ of July** to upload the students project reports. Please note the project does not have to be complete at this stage, students can keep working on them right up until the competition judging day. The reports are assessed, and then the best entries will be invited to the judging event.

The Judging event is being held at ECU on the **3ʳᵈ September.**

Young ICT Explorers

At the event the students work is assessed by a panel of judges made up of leading ICT Industry and University representatives. The Judges are grouped in teams of 3.

Judges are marking students in 4 main areas:

- Creativity and Innovation
- Quality and Completeness
- Level of Difficulty
- and Project Documentation

Students have 5 mins to pitch their project then the Judges have 5 mins to ask questions.

After the judging rounds we follow up with the awards ceremony announce our winning teams and give out prizes.

Young ICT Explorers

This is a YICTE project workstation students have decorated and set up with their project on:

We provide
- 1 Table to set up on per project
- 1 power supply per project
- Chairs for students
- Pin board dividers between projects
- internet access if required to display the project.
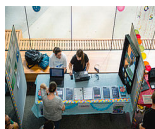
Students are to bring all items to display projects.

Young ICT Explorers

www.youngictexplorers.
net.au

@youngictexplore
#YICTE

www.facebook.com/
youngictexplorers

Young ICT Explorers 2015

Edith Cowan University
School of Education

ECU

How do I learn more?

• What is a Coder Dojo?

Edith Cowan University
School of Education

Fogarty Foundation
Creating opportunity, realising potential.

Nerds get together and code their hearts out and not feel embarrassed

Keep up the good work! CoderDojo is fantastic and my son benefits from it enormously. I hope he'll give back by being a mentor when he's older and is studying IT at University!!

The mentors were extremely helpful, especially when I was having trouble with those tricky codes

What I like about CoderDojo? Allowing kids to have opportunities that I never had at their age

CoderDojo WA

Fogarty Foundation

scitech

Coder DojoWA

Edith Cowan University
School of Education

Fogarty Foundation
Creating opportunity, realising potential.

Edith Cowan University
School of Education

ECU
EDITH COWAN

How do we prepare
young people for a future where
nothing is certain?...

Edith Cowan University
School of Education

ECU
EDITH COWAN

What are some of the skills
and qualities that they will need
in order to thrive ?....

Edith Cowan University
School of Education

ECU
EDITH COWAN

What are some of the challenges
we face in gearing our young people
up with these skills and qualities?

Edith Cowan University
School of Education

What is CoderDojo?

Edith Cowan University
School of Education

CoderDojo

CoderDojo is a world-wide open source social education movement oriented around running free computer coding clubs ("Dojos") for young people aged 7-17 ("Ninjas").

Edith Cowan University
School of Education

What is a CoderDojo?

What are we trying to achieve?

Self motivated learners who continue working on their own projects at home instead of spending all their free time consuming electronic media. ☺

Edith Cowan University
School of Education

ECU
EDITH COWAN

The people in a Dojo

Ninja
7-17 year old participant

Champion
Dojo organiser

Mentor
Person who mentors ninjas

Edith Cowan University
School of Education

ECU
EDITH COWAN

The ingredients of a Dojo
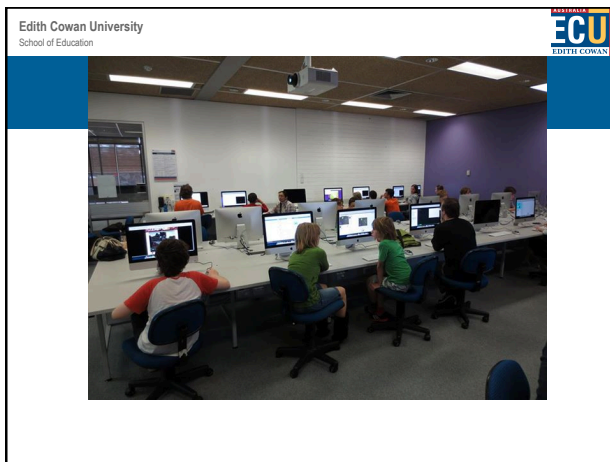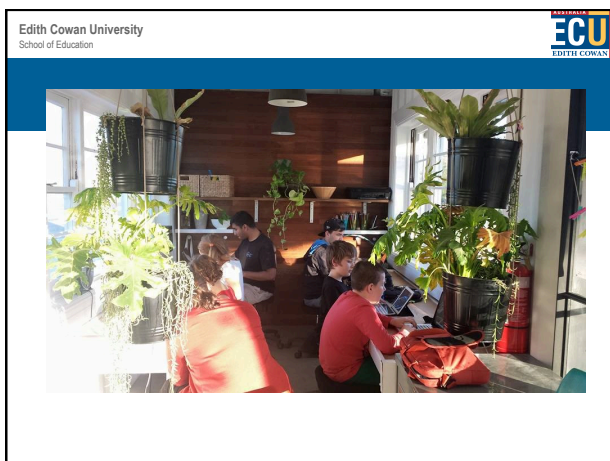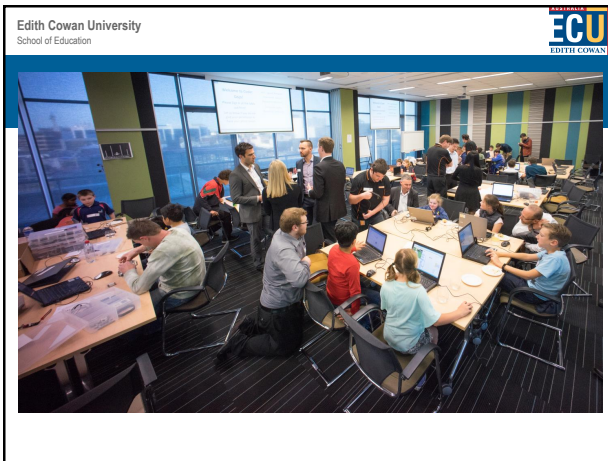
1-3 Champions

Computers
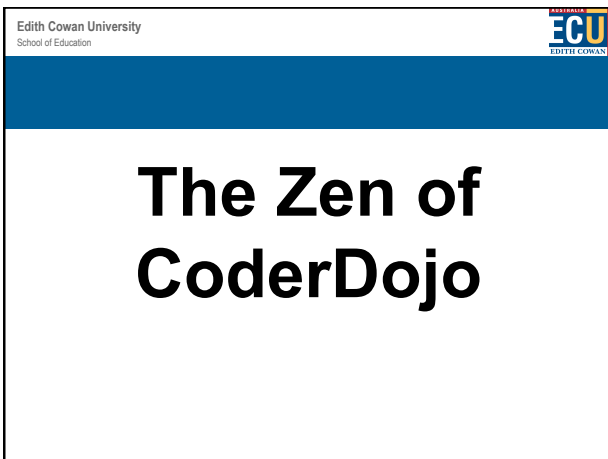
A room

Ninjas

Mentors

What would an ideal Dojo session be like?

- Ninjas working alone, in pairs or groups, on online study platforms and projects of their own choice.
- Ninjas helping and talking to each other.
- Champions, Mentors circulating, spending time talking one-to-one with Ninjas and helping them find answers for themselves.

Edith Cowan University
School of Education

ECU
EDITH COWAN

Edith Cowan University
School of Education

ECU
EDITH COWAN

Edith Cowan University
School of Education

ECU

Edith Cowan University
School of Education

ECU

The Zen of CoderDojo

The Zen of CoderDojo
1/5 A club not a class, supported not structured.
Free & voluntary to attend

Edith Cowan University
School of Education
The Zen of CoderDojo

ECU

2/5 Connect with content and purpose first, and then explore ways of achieving it through

this includes you!

The Zen of CoderDojo
3/5 Coding is a journey not a destination. There are countless starting points and endless ways of achieving goals. Just start!

The Zen of CoderDojo
4/5 Creating a positive environment and enabling quality relationships trumps expertise.

The Zen of CoderDojo
5/5 There are no experts, everyone is a learner. Don't know how to code? Model the process of being a great learner. Be transparent.

Edith Cowan University
School of Education

Ninjas
Love Dojos

Edith Cowan University
School of Education

What Ninjas like about Dojos

"Finding new people with similar interests and hobbies"

"being able to make whatever we want out of code"

"Nerds Get together and code their hearts out and not feel embarrassed"

"Being able to have the freedom of making my own things"

"I liked how we could just use the session for whatever we liked and were not confined to one activity"

"I liked how they just show you how to do it and bam you're free to do what you want"

"I LIKE THAT WE DIDN'T HAVE TO ALL BE DOING THE SAME THING AND THAT WE GOT TO PLAY AROUND WITH THE PROGRAMS AND NOT JUST COPYING OFF THE BOARD."
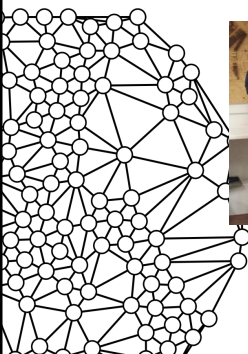
How to start a Dojo?

- Go here, fill out a simple form and follow the instructions you are sent.
www.coderdojowa.org.au/start-a-dojo

- Ask questions on the Facebook Group Wall or on the CoderDojo Zen Community Platform.

You are super important.

Experiment, Share, Encourage, Include, Explore,

Fogarty Foundation

scitech

Coder DojoWA

Edith Cowan University
School of Education

How do we avoid too much screen time?

- The Maker Movement

Edith Cowan University
School of Education

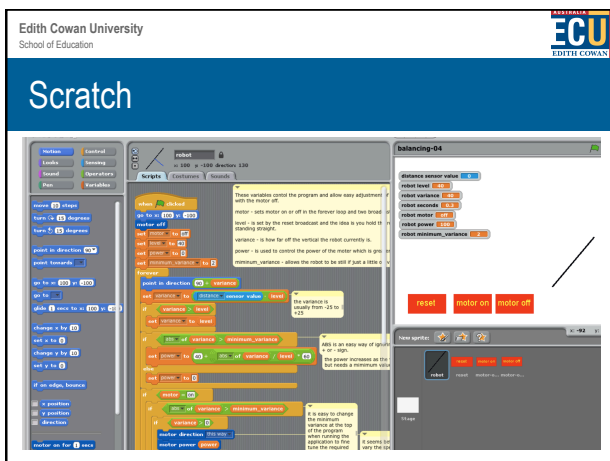## Engineering + Design +Creativity

Edith Cowan University
School of Education

Where do I start?
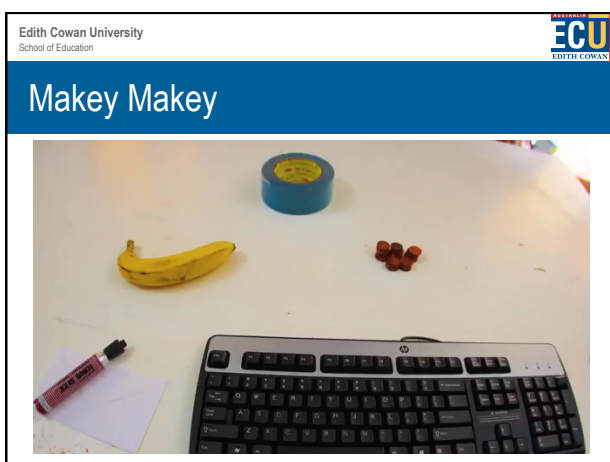
Edith Cowan University
School of Education

Lego Wedo

Edith Cowan University
School of Education

Scratch

Edith Cowan University
School of Education

Makey Makey

Edith Cowan University
School of Education

ECU

7.How can I learn more about this area?

- Ian Gaynor
- President Educational Computing Association Western Australia
- ECAWA
- www.ecawa.wa.edu.au/new

Edith Cowan University
School of Education

ECU

Thank you

- We are always keen to work with you.
- Research- industry collaboration grants
- Future studies- Masters by research, PHD
- ECU Prac Students
- Dr Jenny Lane
- j.lane@ecu.edu.au
- Twitter @edujen blog
- http://dtm4260.edublogs.org