Good practices in teaching in 1st year ICT courses

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ALTA Commissioned Good Practice Report

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Background

Many challenges to teaching 1st year ICT courses:

- Rapid evolution of ICT technology – *what we teach about*
- New technologies for teaching – *what we teach with*
- Changing student population – Net Generation?
- A new learning paradigm?
Project aim

To investigate current practices in the 1st year of ICT courses and highlight examples of good practice in Australian courses.

Two aspects:
1. A literature review of current practice in the 1st year of ICT courses nationally and internationally.
2. Survey of practice in the 1st year of ICT courses.
Key Themes

- *What we teach* – 1st year curriculum
- *Where we teach* – physical and virtual teaching spaces
- *How we teach* – pedagogy, tools, resources
- *How we assess* – methods and tools
- *Learning support* – study, language and communication skills, learning communities
- *Student support* – social support, transition, equity, at-risk intervention
Project approach

**Literature review:**
- Systematic Review
- 2009-2014
- Search terms: Higher Ed, ICT, 1st year, Australia, etc.
- Search of key journals and conferences

**Survey:**
- Interviews – mostly by phone
- 30 ICT academics, 25 universities, 6 States + NT
- Semi-structured – six themes used as a framework
200+ papers – some covering multiple themes

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The context of most papers in each theme was the teaching of programming.
What we teach…

>In Australia…

- Java or Python most common
- and…Visual Basic, C, C#, Javascript, ActionScript, etc.
- also…Scratch, Scribble, Alice
- SFIA framework for curriculum design

From the research…

- The programming language debate continues…
Where we teach…

In Australia…

- New teaching models – e.g., blended learning.
- Shift away from lectures → more time in practical classes or online learning
- New collaborative lab/studio/workshop teaching spaces

From the research…

- Few papers about physical spaces
- Programming environments for novice programming students: (e.g. Alice, Scratch, Greenfoot)
How we teach...

In Australia...

- Changes to lectures - ‘flipped classroom’, peer learning, clickers
- Active pedagogies – e.g. pair programming
- Cooperative and collaborative learning – social media

From the research...

- Models, approaches, techniques, tools, e.g. visualisations
- Cooperative and collaborative learning – social media

*Strong underlying theme of student engagement.*
How we assess…

*In Australia*…

- Traditional assessments – exams, assignment, class tests
- Less used … portfolios, peer assessment, social media
- Verification of student work – tools, monitoring, exam question, interviews

*From the research*…

- Assessment design and strategies - portfolios, peer assessment, social media
- Exams - benchmarking exam questions
- Tools for automatic assessment, marking & feedback
Some concluding remarks…

**In Australia:**
- Evidence of new teaching spaces, changing teaching models and new techniques
- Pockets of innovative practice e.g. portfolio assessment, blended learning, use of social media

**In the literature:**
- Good evidence-based ideas/methods/tools for teaching.
- ICT education literature is overwhelmingly about the teaching and learning of programming.

Key issues: Evaluation and dissemination?