Good practices in teaching in 1st year ICT courses

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ALTA Commissioned Good Practice Report

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

Literature review

- 200+ papers – some covering multiple themes

Theme	Papers
What we teach	28
Where we teach	13
How we teach	89
How we assess	41
Learning support	40
Student support	54

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?