Closing the Gap:

Preparing Computing Students for Employment Through Embedding Work-Related Learning in the Taught Curriculum

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Structure of presentation

1. Employability for computing students
2. The context at Glasgow Caledonian University
3. Research methodology
4. Research findings
5. Conclusion

What is employability?

" A modern, competitive economy needs workers who possess *skills, knowledge* and *attitudes* they can take to any work situation and have the ability and willingness to *continually adapt* and prosper in a changing world." (CBI, Future Fit, 2009)

How employable are Computing graduates?

Graduate unemployment by subject (HECSU, 2010)

UK average	**8.9%**
Law	6.2%
Modern Languages	8.3%
Economics	11%
IT/ Computing	**16.3% = 2% increase since 2007-08**

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What are employers looking for?

(CBI, 2010)

Employability skills	**77%**
Positive attitude	68%
Relevant work experience/ placement	61%
Degree subject	53%
Degree result	25%
University attended	8%

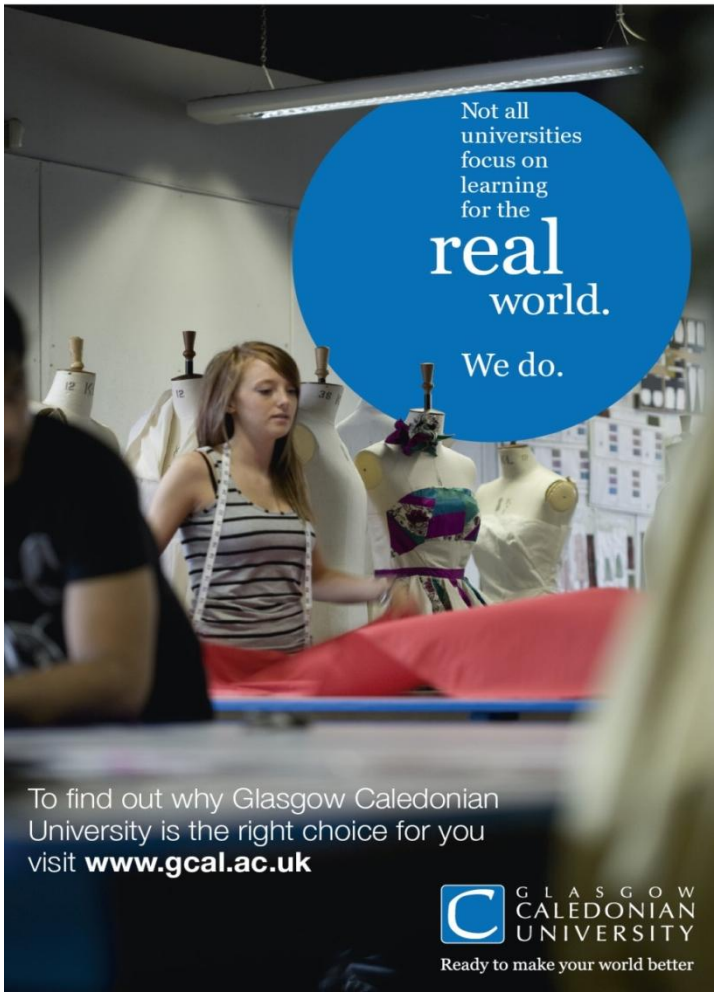
The demand for STEM graduates: evidence of a mismatch

"Science, engineering and technology are the *foundation for innovation* and technological advance, and are traditional strengths of the UK economy. But *skills shortages* will threaten businesses capacity for growth unless action is taken now." (CBI, August 2010)

Businesses demand better quality (STEM) graduates with "wider skills such as team working, communication skills, leadership potential and business acumen." (Levy and Hopkins, 2010)

79% of IT managers expect IT graduates to possess generic skills and a sense of business value (BCS, 2011)

2. The context at Glasgow Caledonian University: "Learning for the Real World"



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The Real WoRLD Project at GCU:
(**Real**ising **wo**rk-**r**elated **l**earning **d**iffusion)

http://www.academy.gcal.ac.uk/realworld/index.html

Aim: Improve and enhance students' employability skills through embedding work related learning activities across the university

- at institutional level : develop and support a coordinated, sustainable strategy for work related learning
- at programme level: encourage implementation of work-related learning activities in the subject specific curriculum
- at pedagogic level: develop innovative approaches to teaching, learning and assessment

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Real WoRLD's principles of work-related learning
(McKinnon and Margaryan, 2009)

Work-related learning activities should be designed so that they:

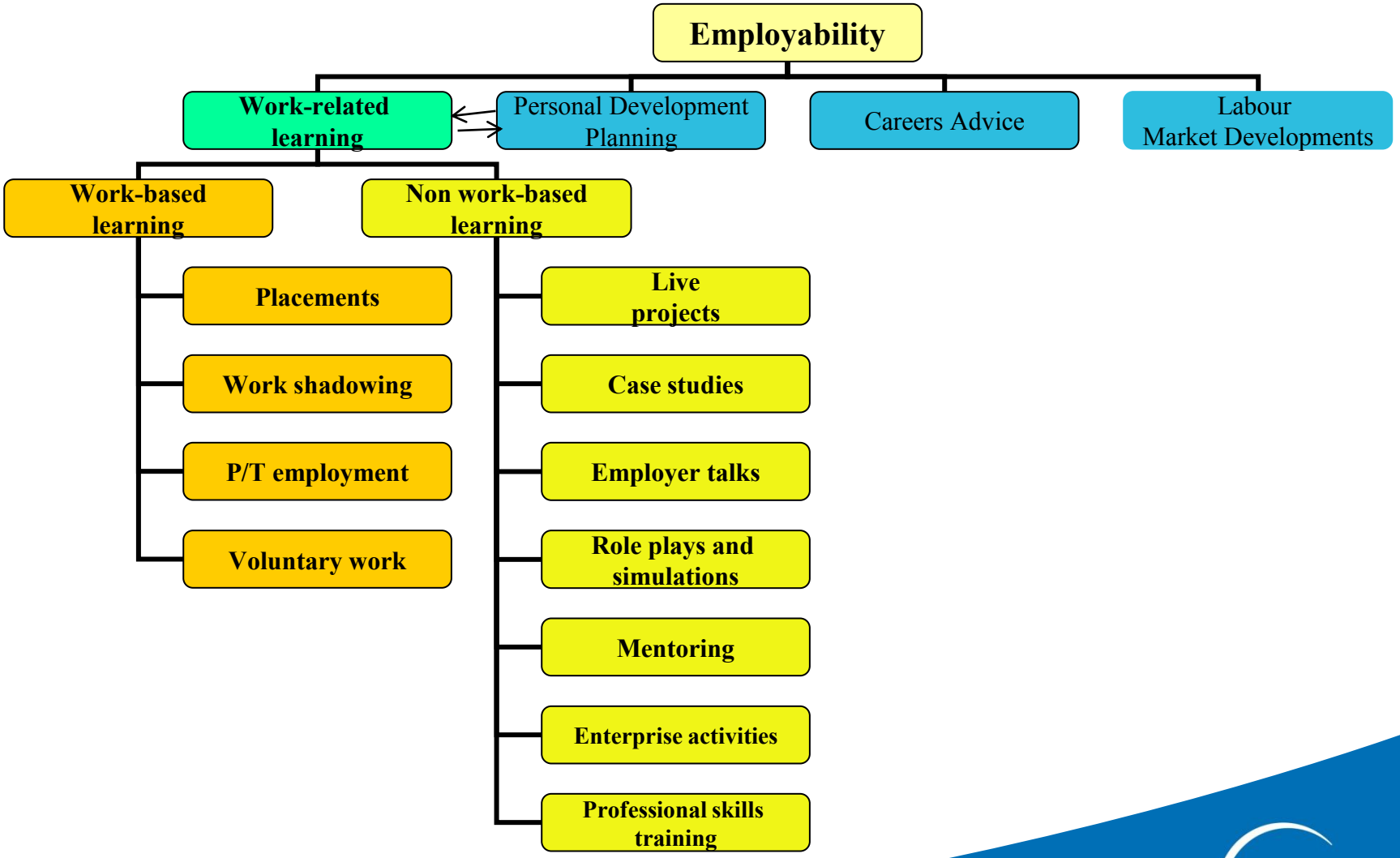
1. provide students with learning opportunities to integrate theory and practice
2. achieve learning outcomes that state what students will be able to do in the workplace
3. encourage and support students' interest in a wide variety of careers
4. require students to take an active rather than a passive role in the learning process
5. accommodate cultural diversity.

Reflective questions break down the components of each principle.

Good practice examples illustrate them.

How can work-related learning be embedded?

(Adapted from Hills et al, 2003)



"Integrated Project 1" module

- **Aim**: To equip graduates for a career in developing/support of modern software systems

- Learning **outcomes** include:
  - Following a project plan, using professional skills, team working, undertaking independent research

- **Lectures** and **tutorials:**
  - Project & time management, team working
  - Employability talks: alumni, placement students, industry experts

"Integrated Project 1"

- **Assessment** :
  - Group work to produce a computer based systems engineering solution for a problem in the domain of the students' programme of study
  - E.g. database design, web site design, computer game design
  - Presentation of results in group report and oral presentation

3. Real WoRLD pilot research: How feasible are the 'principles'?

Research question:

What are the benefits and challenges of embedding work-related learning in the taught curriculum?

Methodology for *Integrated Project 1* pilot: mixed method

- Two student surveys (pre- and post-) : 159 responses

  Survey 1: 85 responses = 71% of cohort

  Survey 2: 74 responses= 62% of cohort

- 29 students in focus groups

- 74% aged 18 -19

Self assessment of employability skills in surveys

Commercial skills	Identifying commercial opportunities Presenting and implementing project plans …
Learning skills	Evaluating own strengths and weaknesses Acting on feedback Working without guidance …
Transferable professional skills	Written and oral communication Formal presentating Time management …
Team-working skills	Listening to the view of others Acting assertively Taking the lead in group discussions …

4. Research findings

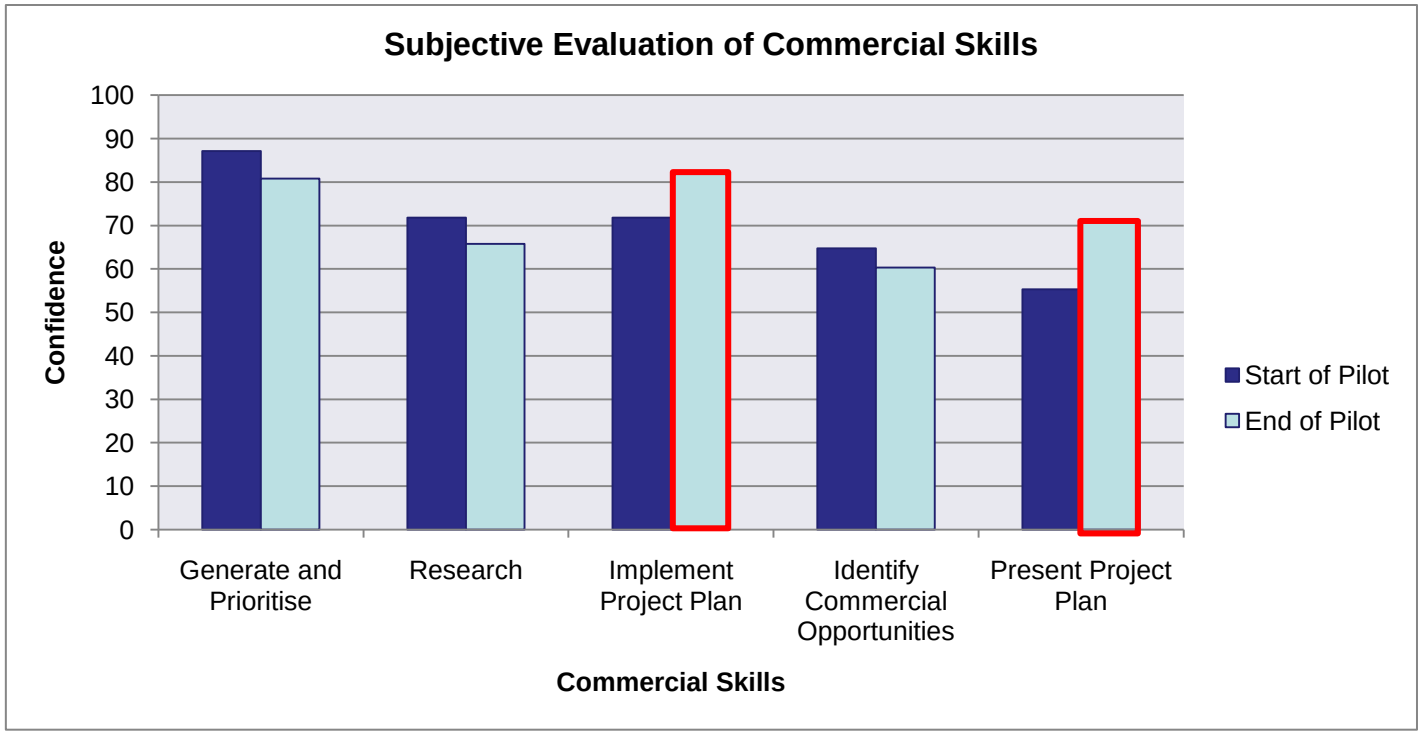
- 85% of respondents reported improved employability skills

- Learning by doing was considered most useful for future job hunt

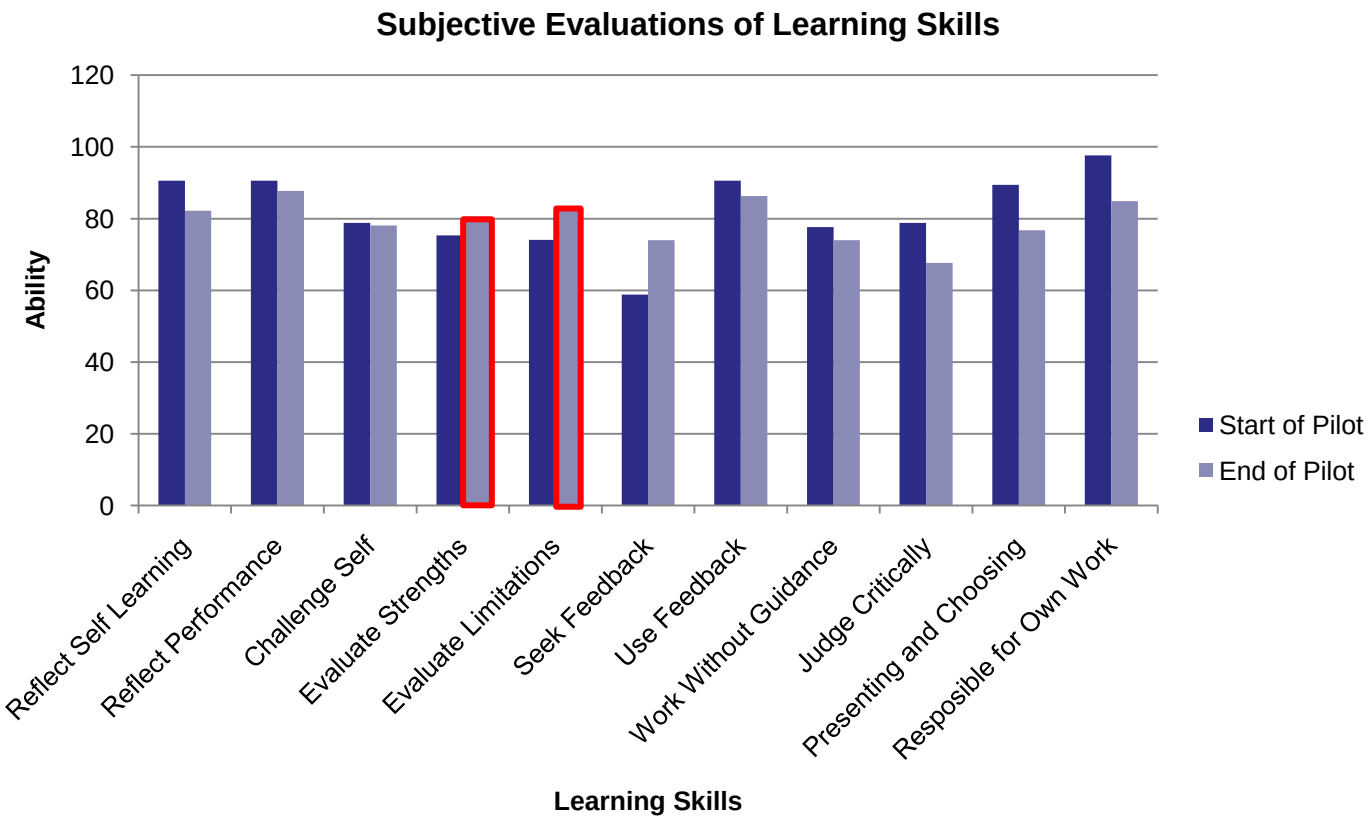
"It has shown me exactly what it will be like working in a team in industry."

"It proved that I can work well in a team and that will prove helpful when applying for a career…"

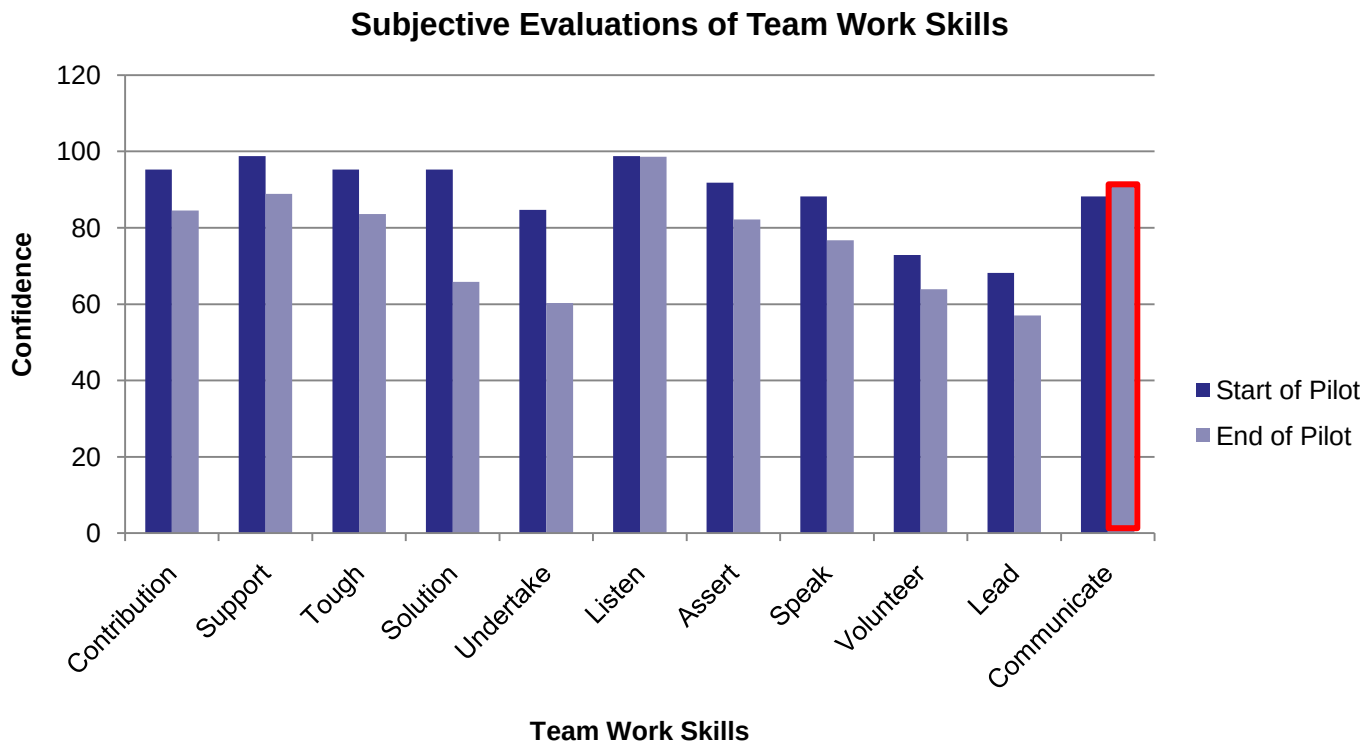
Evaluation of commercial skills



Evaluation of learning skills



Evaluation of team-working skills



Early awareness of the skills gap can be a starting point for better learning at university

"Well, I think it (the module) sort of prepared the groundwork. Obviously there's a lot further to go, at least two years to go, but ***you're starting to learn some things that you can't do.*** *Like you can't leave things to the last minute, like you could maybe do in school."*

Improved awareness of independent learning skills

" I liked the practical aspect of 'there is the project, go and do it'. I think that ***was good …from the point of view of teaching you independent learning.*** *I think the only way you're ever going to learn that is by being basically thrown in at the deep end and I particularly enjoyed the independence of being able to just go and do rather than just being told…just being spoon fed."*

"… in other modules you kind of get taught and you get tested. In this one you were just given a wee tiny bit of stuff and thrown into doing ***it…you were not actually given the answers*** *if you know what I mean. In other classes you were given the answers somewhere and you just had to learn them. In this one you were not really given that."*

The value of embedding work-related learning

Exposing first year students to the demands of the graduate workplace through simulating professional learning practices in the taught curriculum can help them plan their own learning at university.

What are the challenges?

- Higher anxiety levels amongst students
- Lack of consistency in defining academic standards and expectations
- Lack of departmental support
- Increased workload for staff

5. Conclusion

- Employability is a learning and teaching issue.
- From first year onwards students need to be exposed to ‘messy’ real-life problems that do not have one textbook-answer.
- They should expect to be challenged and not be surprised or stressed when they are.
- WRL should be recognisable and spread evenly across *all* programmes because it can help students become better learners at university and in the workplace.

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