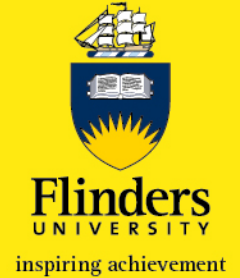


Rethinking Bachelor of Information Technology / Bachelor of Computer Science content



Professor John F. Roddick

Context 1

- As academics, ICT departments teach our discipline fairly well although we could do better.
 - Satisfaction scores and Good Teaching scores are lower but similar to those for other technological disciplines.

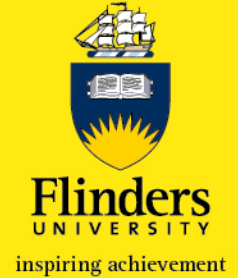
– From QILT website:

Science and Mathematics	83.40%
Psychology	83.30%
Humanities	82.70%
Communications	82%
Health Services and Support	81.50%
Law	81.20%
Tourism and Hospitality	81%
Education	80.30%
Creative Arts	79.90%
Medicine	79.80%
Nursing	78.10%
Business and Management	76.80%
Engineering	76.30%
Architecture and Building	76.10%
Computing and Information Systems	74.80%

Context 2

- The computing industry believes that some of their best programmers are not University-trained.
 - “Everyone knows about the disconnect between academia and the industry” – Godfrey Chan
- Programming is taking off as a Primary School activity. As are Coding Schools, iTunes U, OpenCourseWare, Coursera, EdX ...

Context 3



- My concern/suspicion is that what we teach is not what we need our students to learn and this is affecting their perceptions of quality of our courses.
- The computing industry is all about disruption and what we teach is as affected by disruption as any other discipline, perhaps more so.

“Computer science is no more about computers than astronomy is about telescopes”.

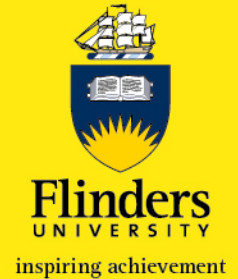
Edsger Dijkstra

Disruption

Three forms of disruption in Universities

1. The way in which a discipline is taught is changed by the new technology.
 - MOOCs, Online Ed., Apps,...
2. What needs to be taught by a discipline to achieve the same learning outcomes changes.
 - Eg. Education degrees, Civil Engineering degrees, Medical degrees
3. The actual learning outcomes change as a result of technology.
 - Eg. Journalism degrees, ICT degrees

Our workforce



- A typical Department of Computer Science comprises many of the following:
 - Graduates from that University
 - People who have graduated in computer science over 20 years previously (or worse)
 - Postdocs who have transitioned to teaching
- Very few academics have worked in industry and if they have, it was a while ago.

Our Curricula



Flinders
UNIVERSITY
inspiring achievement

So, some questions:

1. How much of our curriculum is based around large computers and PCs? And how much around mobile devices? (Think about your Operating Systems courses).
2. How much of your database curriculum is based around the relational model?
3. What languages do you teach?
4. Do you teach disruption?

“I think computer science, by and large, is still stuck in the Modern age”.

Larry Wall

From SEEK -
April 19, 2017

Accounting	8,150	Help Desk & IT Support	1,064
Administration & Office Support	7,665	Management	373
Advertising, Arts & Media	939	Networks & Systems Administration	853
Banking & Financial Services	3,585	Other	612
Call Centre & Customer Service	3,713	Product Management & Development	150
CEO & General Management	444	Programme & Project Management	1,320
Community Services & Development	3,210	Sales - Pre & Post	401
Construction	7,552	Security	384
Consulting & Strategy	678	Team Leaders	100
Design & Architecture	2,055	Technical Writing	52
Education & Training	5,360	Telecommunications	406
Engineering	4,567	Testing & Quality Assurance	471
Farming, Animals & Conservation	536	Web Development & Production	502
Government & Defence	4,259	Insurance & Superannuation	1,271
Healthcare & Medical	12,137	Legal	3,629
Hospitality & Tourism	7,384	Manufacturing, Transport & Logistics	10,077
Human Resources & Recruitment	3,074	Marketing & Communications	3,595
Information & Communication Technology	14,210	Mining, Resources & Energy	2,954
Architects	745	Real Estate & Property	3,845
Business/Systems Analysts	1,509	Retail & Consumer Products	5,922
Computer Operators	16	Sales	8,542
Consultants	710	Science & Technology	686
Database Development & Administration	362	Self Employment	169
Developers/Programmers	2,959	Sport & Recreation	751
Engineering - Hardware	116	Trades & Services	14,560
Engineering - Network	321		
Engineering - Software	784		
		TOTAL	159,729

Strategies

- Regular short-period industry sabbaticals
- A preference away from hiring our own postdocs and PhD graduates as staff
- Large, representative industry advisory boards
- WIL in ICT – Encouraged? Mandatory?
- Industry certification embedded topics
- Include specific topic examples
 - Griffith Uni – Rethinking Journalism
 - Many Unis – Rethinking Science degrees

Ember
Rails

UnrealScript
Unreal Engine

JavaScript Concurrency MVC
 REST Design Patterns
 DOM Dev Ops Event-Driven Programming
 CSRF TDD OAuth Big Data
 Performance Ruby UI Design
 Memory Management Security
 JSON API HTML Dynamic Languages
 HTTP REST SSL CSS
 Open Source Software

The CS cliff



Networking
Operating System
Data Structures
Programming 101

Information Systems
Database
Algorithms
Computer Architecture

Computer Vision
AI
Statistics
Discrete Math

Animation
Graphics
Linear Algebra
Calculus