ACS Foundation
Advancing ICT through Scholarships and Research

ACDICT
Australian Council of Deans of Information and Communications Technology

ACDICT and ACS Foundation
Academic & Industry Discussion

Theme: Standards

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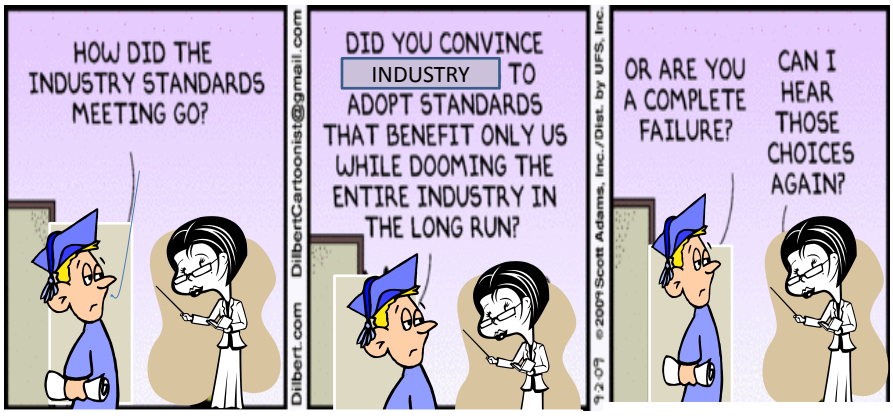


With apologies to Dilbert

Academia and Industry

Does Industry understand the role of a University education? Does University understand the needs of Industry? Are there realistic expectations?

The complexity that is academic standards.

How can the profession better clarify what are the core standards and requirements of a graduate ? How can government be guided in its approach to standards development ?

Academic standards c/f professional accreditation

Current standards processes.

Does ACS accreditation and the Core Body of Knowledge (CBOK) need more industry involvement?

A way forward …

In the beginning …

- Universities are about education not training

– preparation for the profession; for a future not just now.

- Immediate employability of graduates is a concern, a priority, but not a responsibility.
- Not all students study for the purpose of (immediate) employment.

- Demand for graduates does not equal student demand.

- Universities are at the end of the education pipeline.

Does school education work against the ICT profession?

- Who is "the industry"?
  - members of the university discipline advisory body?
  - the accrediting Professional body?

Curriculum

Curriculum is an integrated package of content, activities, interactions, assessment, feedback etc. Formative and summative.

Curriculum needs to address learning objectives.

Learning objectives and thus curriculum influenced by
- Increasing Academic standards requirements and institutional quality processes,
- Professional accreditation requirements
- Available discipline expertise and prevailing discipline flavour(s)
- Student market demand
- Resources
- Local industry demand etc.

Standards: Why

Education is one of the world's largest "industries". And it is going to get much bigger.

Global tertiary education :
Average participation rates
2015 ↗ 30+% 2020 ↗ 35+%
1 billion people of conventional "tertiary age" in 2015

Students in tertiary education
2015 305 – 335 million 2020 375 – 405 million

1:50 staff to student ratios will require over ***7.5 million academics***

At least 7 million internationally mobile students.

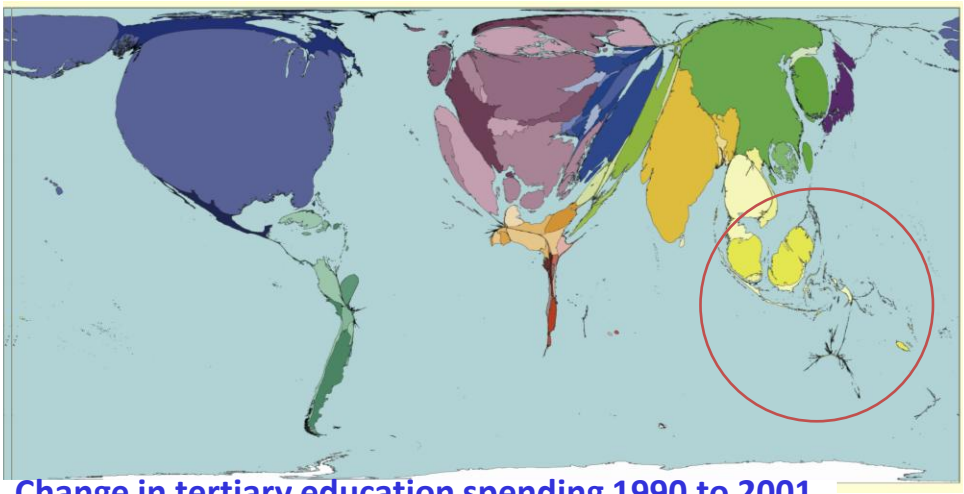
Standards: Why

Governments (and other stakeholders) recognising importance of 21st century capable workforce.
"25-34 year olds with a degree from 32% in 2008 to 40% by 2025".

Recognition of education as key means to address inequity and poverty; to achieve productivity.
"low socio-eco uni students from 15-16% in 2007 to 20% by 2020"

In many countries growing investment in post-secondary education accompanying this growing stakeholder desire for some form of "reassurance" re return on investment
→ Quality assurance (not necessarily issues)
→ STANDARDS

Standards: Why



Change in tertiary education spending 1990 to 2001.
http://www.worldmapper.org/display.php?selected=212

Standards: Why

Increasing mobile student population
→Need for comparability
→ STANDARDS

Multi-sector and multi-award career pathways
→ Need for "seamlessness"
→STANDARDS

BUT standards not a solution to The Supply Problem

Growing skills shortage with anticipated exacerbation by aging population demographics.
→ Profile/Quantity concerns → ???

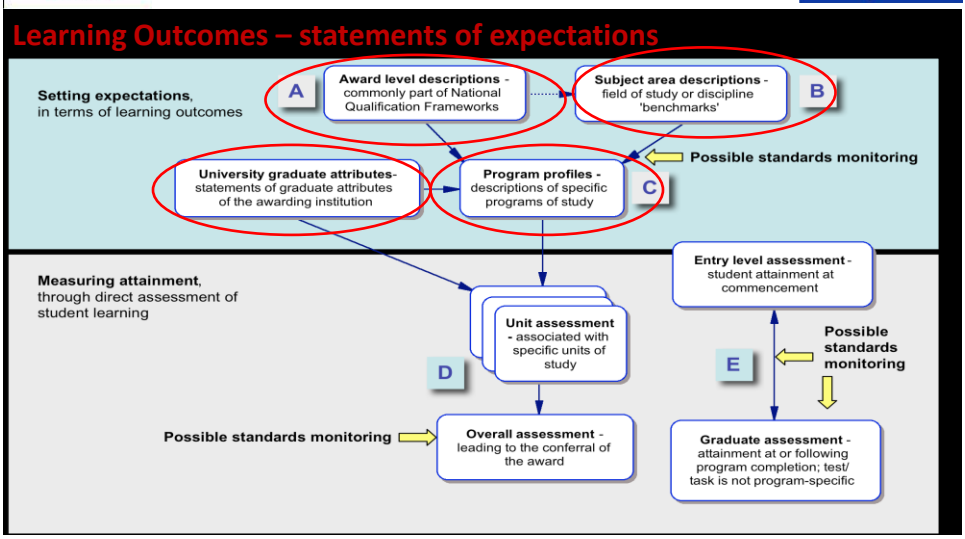
Standards: What

Academic standards: *agreed reference points for measuring academic achievement*

Agreed – by who? What level of agreement?
Reference points – about what? level of detail?
Measured – how?
Academic Achievement – what?
Relationship to professional standards?

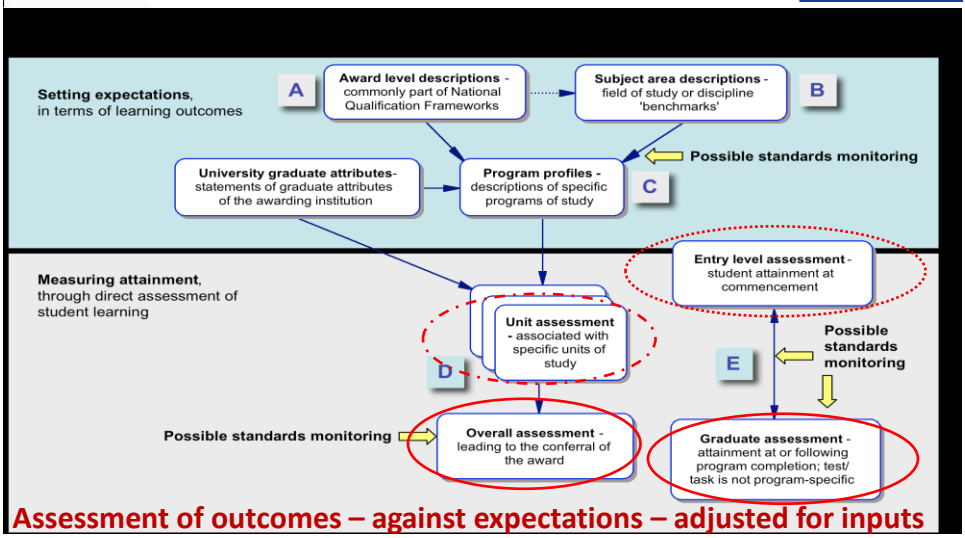
Not guarantee
Not standardization
Not universal remedy

Academic Standards: What



http://www.auqa.edu.au/qualityenhancement/academicstandards/environmental-scan.pdf

Academic Standards: What



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Standards: international activities

Tuning Process – European initiated process to establish common EU award structure and then subject benchmarks.

Award level standards e.g. communications at Bachelor c/f Masters

Subject level standards – common context and skills.

OECD Assessment of Higher Education Learning Outcomes (AHELO)
"value-added testing of exit standards less admission standards"
Currently two pilots – Engineering includes Australia
Concerns that the test will become "the subject".
http://www.oecd.org/document/22/0,3343,en_2649_35961291_40624662_1_1_1_1,00.html

UK Quality Assurance Agency (QAA) for Higher Education.
"identification of *threshold* standards of achievement"
Threshold – minimum standards ... consistent with the award.
http://www.qaa.ac.uk/academicinfrastructure/benchmark/statements/computing07.asp

Standards: national activities

ALTC (Australian Learning and Teaching Council)
– pilot development of disciplinary standards for bachelor level, lead by discipline scholars
http://www.altc.edu.au/standards/overview
– in order to inform the learning and teaching standard (one of 5) that the newly formed (but not yet established)

Tertiary Education Quality and Standard Agency (TEQSA) .

→Significant influence on universities.

AQF (Australian Qualifications Framework) to define award-level "standard".

ACS accreditation

CBoK – body of knowledge

SKILL - Graduate Skill Sets (e.g. as defined in SFIA)

***CORE - Core Body of* Knowledge (necessary but not sufficient)**

ICT Problem Solving & Professional Knowledge

Technology Building — Outcomes Management

Technology Resources — Services Management

***SPEC - ICT Role Specific* Knowledge**

Additional knowledge building on one or more of the core areas

***COMP – Complementary* Knowledge**

Could include knowledge from a range of other disciplines.

Importance of capstone project as demonstrating achievement.

Gregor, S., von Konsky, B.R., Hart, R., and Wilson, D. (2008). *The ICT Profession and the ICT Body of Knowledge (Vers. 5.0),* Australian Computer Society, Sydney, Australia. www.acs.org.au/attachments/ACSCBOKWorkingPaperV5.0Oct2008.pdf

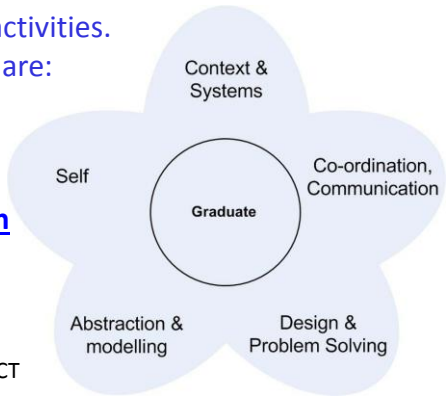
ALTC Discipline Scholars standards

The elements or learning outcomes (LOs) are specific, measurable statements setting out what personal attributes will be developed or what a learner will know and be able to do as a result of engaging in learning activities.

The 5 learning outcome categories are:

1. **Context and Systems**
2. **Problem Solving and Design**
3. **Abstraction and Modelling**
4. **Co-ordination & Communication**
5. **Self**

[Adapted from draft standards of Engineers Australia, the Australian Computer Society and stakeholder consultations.]



http://www.altc.edu.au/standards/disciplines/EICT

Context and Systems

Elements (Finer detail of Outcomes)

- **Recognise and specify the goals of designed systems within their contexts.**

- **Identify, interpret and analyse the interactions within and between designed systems and their contexts (social, environmental, etc).**

- **Identify, interpret and analyse ethical implications and accountabilities of professional practice.**

Typical Evidence: **Final year project reports**

Problem Solving and Design

Elements (Finer detail of Outcomes)

- **Apply technical knowledge, established problem solving and design methodologies, and appropriate tools and resources to develop components, systems and/or processes to meet broadly specified requirements.**

- **Apply creative approaches to identify and develop alternative solutions, concepts and procedures, and develop confidence to challenge practices from technical and non-technical viewpoints and to identify new opportunities for solution.**

- **Locate, evaluate, use and organise information for both individual and group use.**

Typical Evidence: **Final year project reports**

Abstraction and Modelling

Elements (Finer detail of Outcomes)

- **Apply abstraction, mathematics, scientific method and discipline fundamentals to the analysis and solution of complex problems**

- **Conduct investigations of complex problems using research-based knowledge and research methods**

- **Apply models to analysis and design, understanding their applicability, accuracy and limitations.**

Typical Evidence: **Final year project reports**

Coordination & Communication

Elements (Finer detail of Outcomes)

- **Apply basic tools and practices of formal project management to the planning and execution of a complex project.**

- **Function as an effective member or leader of diverse teams, including those with multi-disciplinary and multi-cultural dimensions.**

- **Communicate proficiently in listening, speaking, reading and writing English for professional practice**

Typical Evidence: **Final year project reports; Final year oral presentation; Peer assessment of team capability; Records of team's project management**

Self

Elements (Finer detail of Outcomes)

- **Review personal performance and capabilities as a primary means of planning and managing professional development.**

- **Manage time and processes effectively: prioritise competing demands to achieve personal and team goals and objectives.**

Typical Evidence: **E-portfolio of continual professional development**

ALTC Discipline Scholars standards

Contribute your views on the minimum key skills, knowledge and abilities expected of students for graduate entry into the profession by completing the survey at:
http://www.surveymonkey.com/s/PQ8YMMM

The survey takes 10-15 minutes to complete and is open from 13 September to 31 October, 2010.

http://www.altc.edu.au/standards/disciplines/EICT

Your assignment

Key ways in which Industry may influence academic standards
- the ALTC discipline project
- ACS accreditation
- university/discipline course advisory committees (local impact)

1. Is Industry adequately involved in these? If not, how to improve the situation?
2. Is the role of the final year capstone project "over-loaded"?
   2a. Should it be industry-sourced? Sponsored? …
3. Are Academic standards (and their application) sufficient for an "industry-ready" commencing professional?
4. Should Industry, the Profession and Academia commit to looking at a 12 week placement like that of Engineering? Or …
5. Can anything be done about the "supply problem"?
6. Does Industry need to influence the impact of school education on the attractiveness of the ICT profession? If yes, how?

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Thank you.

Questions ? Comments?

Your assignment

Key ways in which Industry may influence academic standards
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- university/discipline course advisory committees (local impact)

1. **Is Industry adequately involved in these? If not, how to improve the situation?**

Definitely the opportunity for industry to be involved.
What is Industry?
Industries need to look to common core rather than their individual on-top specifics.
Bachelor degree more of a generalist degree –exposure to other areas.
Content not so relevant as the development of problem solving and other skills, demonstration of aptitude, how not what?

Your assignment

Is the role of the final year capstone project "over-loaded"? Should it be industry-sourced? Sponsored? …

Capstone project important – not necessarily a team project.
BUT there should be a formative process leading up to the project.
The capstone cannot make up for deficiencies elsewhere.

3. **Are Academic standards (and their application) sufficient for an "industry-ready" commencing professional?**

Need to see bachelor graduate as "apprentice" professional.
Need to expose students to notion of ICT profession and ICT professionals from first semester and embed it throughout.

4. **Should Industry, the Profession and Academia commit to looking at a 12 week placement like that of Engineering? Or …**

Not discussed

Your assignment

Can anything be done about the "supply problem"?
Not really discussed.

5. **Does Industry need to influence the impact of school education on the attractiveness of the ICT profession? If yes, how?**

School involvement should be aspiration building

Industry marketing into schools – not university self-sell

Need to have different pathways and first year approaches for capacity of current student cohorts.