

# **The SAFFIRE Project at the University of Canberra Transforming ICT learning and teaching (@ UC)**

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## About the presenter

- Telecommunication Engineer + Electronic Engineer
- MSc in Computer Vision
- PhD in Electronic Engineering (visiting researcher @ U. Oxford)
- Head of research group in Multimodal Signal Processing (HCI) and Technology Transfer Center
- Exec Edu. + Master in Project Management. PRINCE2 accreditation.
- Program director, Head of discipline @ University Ramon Llull
- Visiting Senior Research Fellow @ National University of Singapore (sabbatical in 2011)
- ADE @ Faculty of ESTeM in University of Canberra



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## BACKGROUND

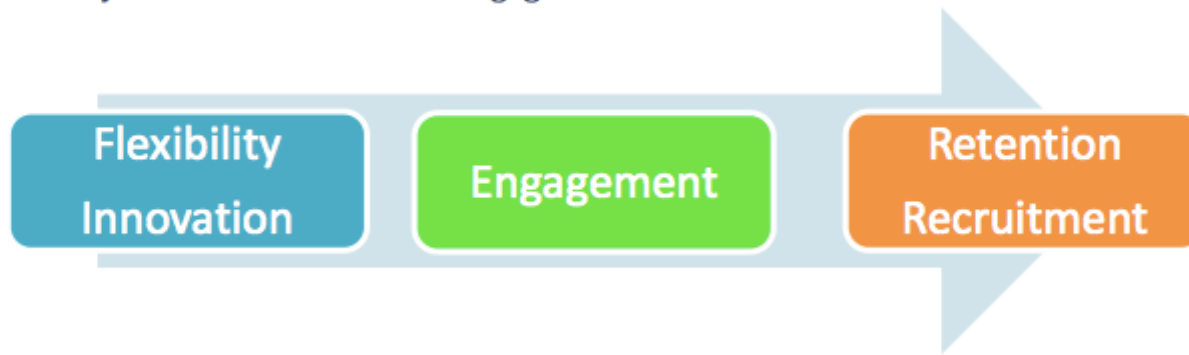
- The University of Canberra was awarded a Structural Adjustment Fund (SAF) grant from the Australian Government so that students could access a **higher quality and modern learning experience**.
- A major part of the grant is known as SAFFIRE which promotes **Flexibility, Innovation, Retention and Engagement** across UC.



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# FIRE: Flexibility- Innovation-Retention-Engagement

FIRE: Flexibility-Innovation-Retention-Engagement



SAFFIRE supports the UC Strategic Plan's objective to increase the number of FTE students

# SAFFIRE

STRUCTURAL ADJUSTMENT FUND for FLEXIBILITY  
INNOVATION, RETENTION, ENGAGEMENT

- The overall goal of the SAFFIRE project is to **create a curriculum that will support flexible and innovative learning** approaches which fit the requirements of students
  - course redesign to achieve teaching excellence; and
  - ensure appropriate learning technologies and supporting administration systems are in place.



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# SAFFIRE

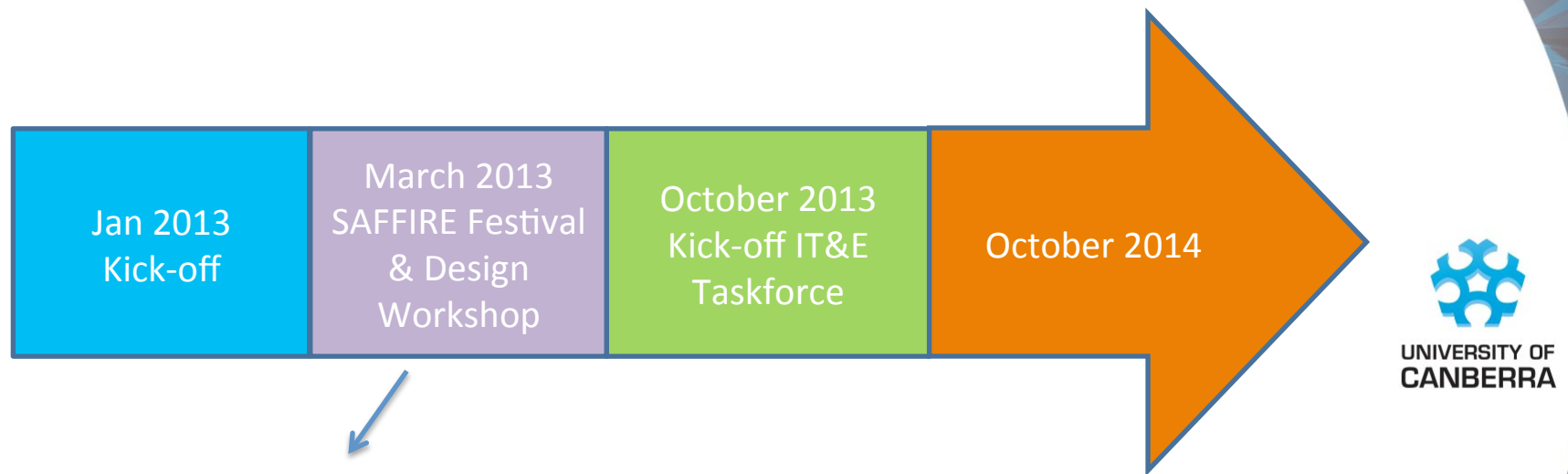
The project focuses on five elements to achieve this goal:

- Curriculum design
- Support and engagement
- Technologies and learning environments
- Cultural change
- Policy and process review



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# TIMELINE



SAFFIRE festival explored **flexible learning** and saw expert speakers discussing the **future of education, innovative teaching, learning methods and educational technology**

# IT&E TASKFORCE

- Principles:
  - **Learning experience:** best T&L practices and relevant learning technologies
  - **Employability:** industry demand, ACS CBOK, SFIA skills, EA guidelines
  - **Coherent curriculum:** constructive alignment and benchmarking. Design the students' learning journey and have a layout consistent with it
  - **Research-led education:** direct link with research capacity



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## ULTIMATE GOALS

- Increase attraction
- Increase retention
- Improved progression
- Efficiency by design



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## STAGES FOR CURRICULA REVIEW/REDESIGN

- Curricula review at the light of external accreditation guidelines, input from Industry Advisory Panel and consistency in the IT&E portfolio
- Review of external curricula
- Development of recommendations
- Discussion with staff, refinement, and implementation
- Ongoing discussion with industry, next panel in June
- Marketing and Enrolment: July-November



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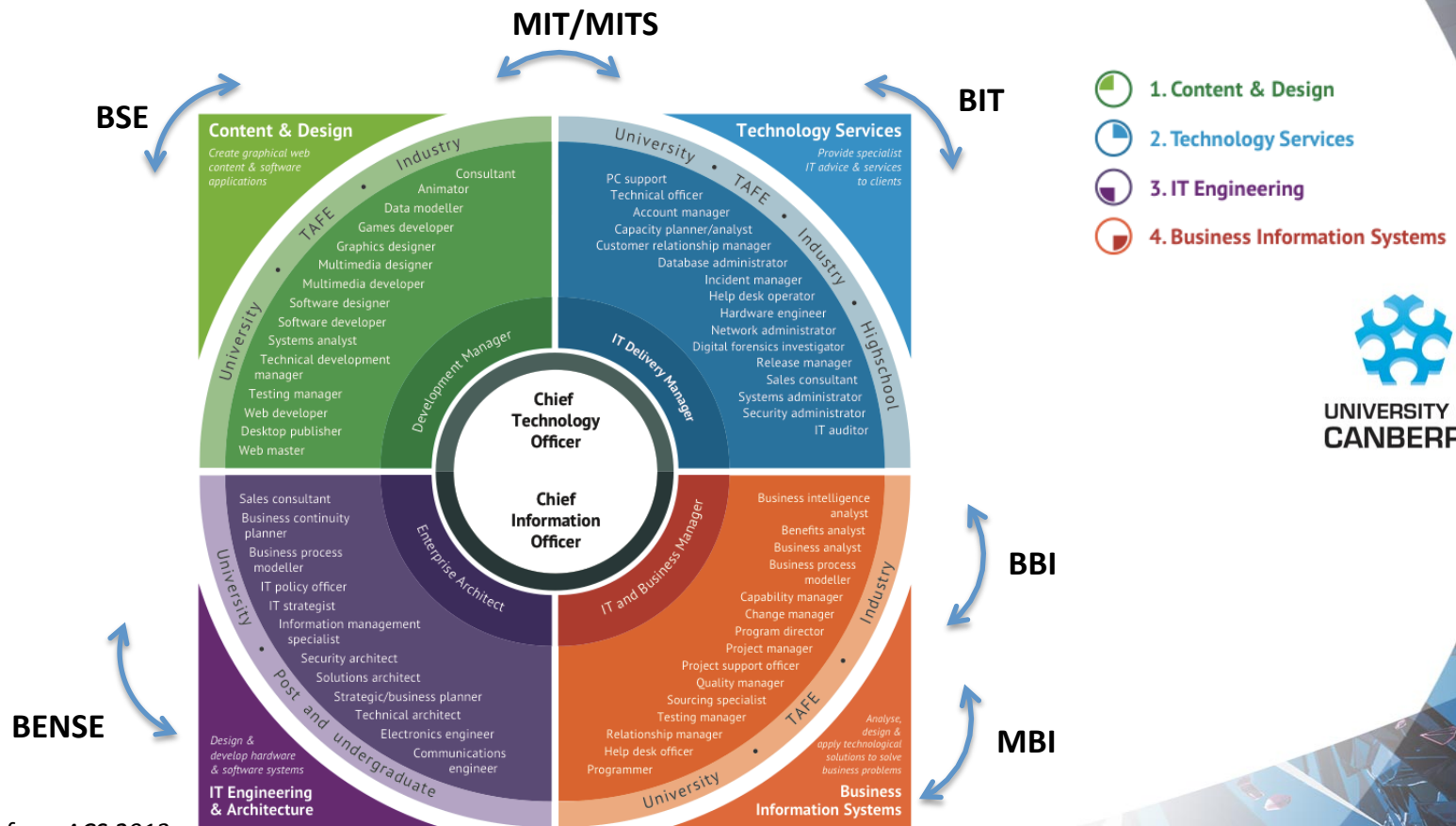
## Approach to curriculum design

- ICT roles of graduates: Career outcomes as driver to design the ICT curriculum
- Skills required in such roles: Skills for the Information Age (SFIA) as tool to identify graduate skills
- Mapping of unit learning outcomes against SFIA
- Integration of relevant competitions in the program (EwB, MS Imagine Cup)



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# ICT Career Wheel and mapping with IT&E portfolio at UC



ICT Career Wheel from ACS 2013

- <http://www.ichoosetechnology.com.au> : ***“As tomorrow’s ICT professional you are likely to be working with technologies that don’t exist yet.”***
- ACS: The ICT Career Wheel and Career Map: ***“developing skills in science, technology, engineering or mathematics can be a helpful foundation.”***

Yet, the mathematical background of our students is diverse and has been identified as a potential difficulty.



# METHODOLOGICAL CHANGE

- Constant: One of the distinctive elements of the University of Canberra identity is the level of support and the quality of engagement afforded to its students.
- Change:
  - Mathematics Mastery Module
  - Flipped learning



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### **The Mastery Process**

- Focus is on the learner, less the teacher.
- Clear cognitive development plan.
- Discrete achievable objectives.
- Integrative tutorial/lab sessions
- Defined mastering points (Assessment Points).
- Students to attain a defined achievement level (e.g. 80%) before they can progress to next set of learning experiences.

### **Main Advantages**

- Highly effective for establishing basic knowledge and skills.
- Significant improvements in student learning outcomes and attitudes.

## **SAFFIRE Mastery Learning Project**

### **Implications**

- Required changes to UC processes and policy.
- Student progression can be very fast or slower than normal. Self-paced approach.
- The need to heavily modularise unit content
- Need for well-developed rubrics to establish Mastery points and overall Mastery



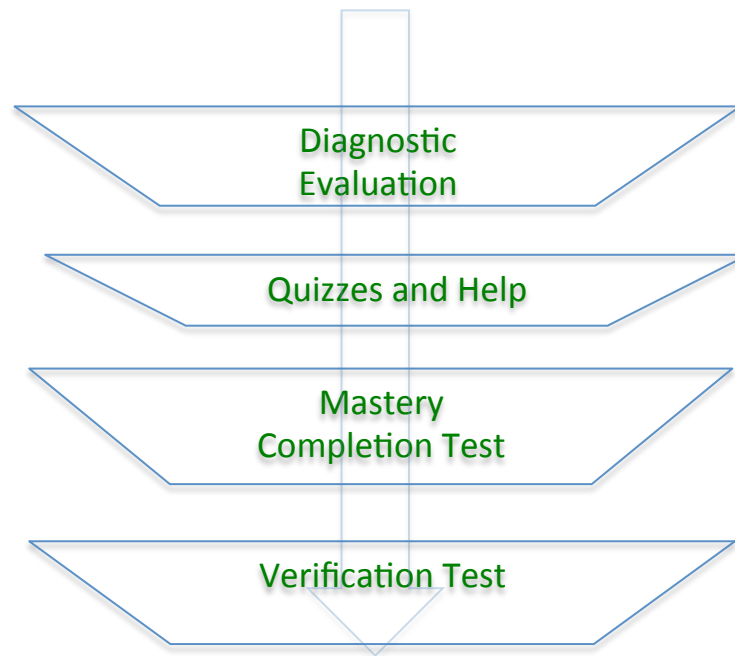
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### **Our Experience to date**

- Mastery applied to maths units: Mathematical Methods, Engineering Mathematics 1& 2 (also other units in Science)
- Module is basic entry level Mathematics
- 90% of current students have achieved the 80% Mastery level in the module
- Average performance increase of 44%
- Particularly effective with weaker students



Mathematics Pathways  
Process – Online via Pearsons MyMathLab



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# FLIPPED LEARNING



*“Flipped Learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter.” -Flipped Learning Network (2014)*

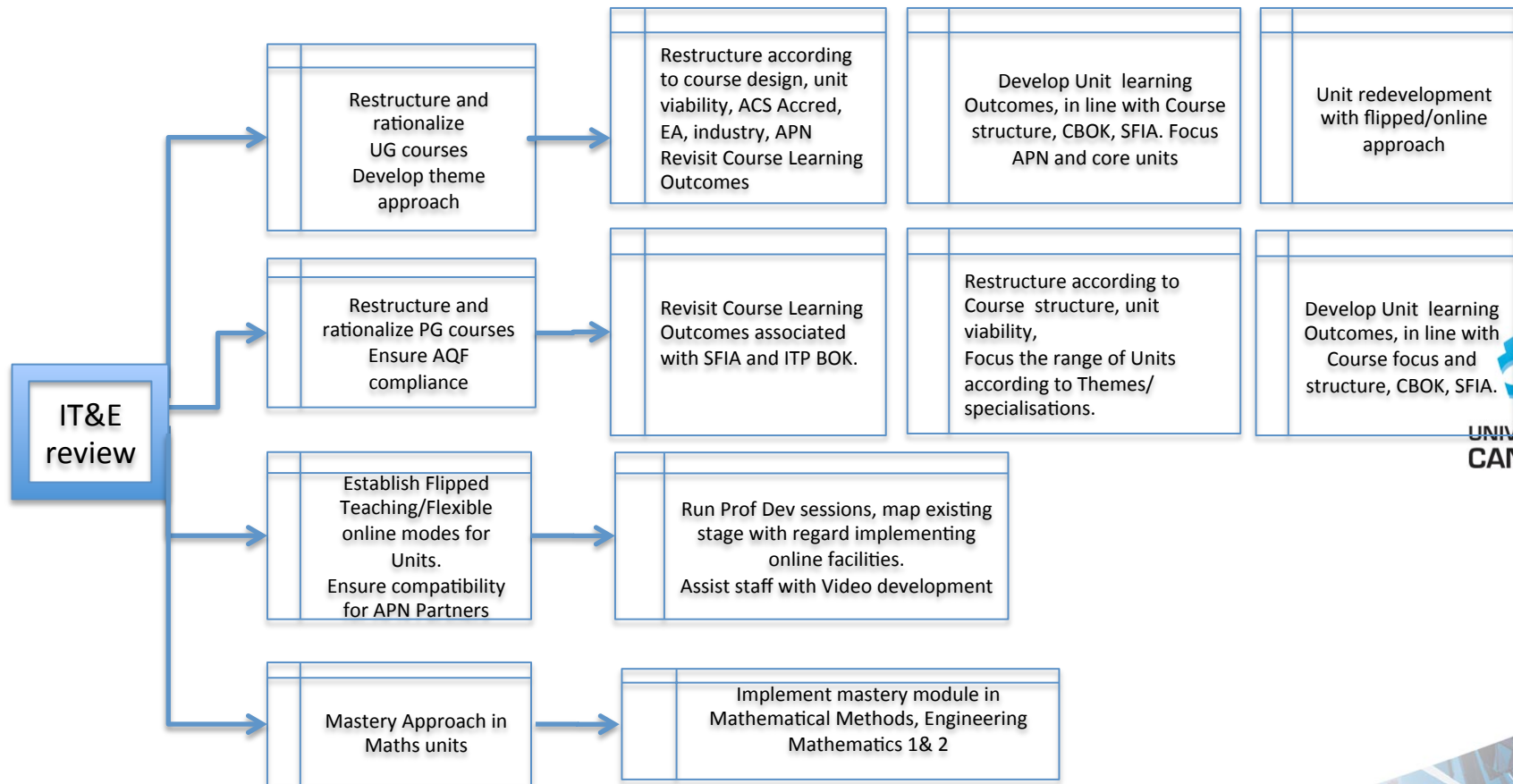
## FLIPPED LEARNING. Implementation

- Reinforcement of tutorials and labs over traditional lectures.
- Flipping basic content and using tutes/labs for hands-on practice, where the students test their understanding and see the applicability/use of the concepts.



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# IT&E REVIEW SUMMARY



## CONCLUSION: OUTCOMES

- Curriculum ready to support flexible and innovative learning approaches
- Increased flexibility with mastery modules and flipped learning
- Courses ready to be delivered at distant locations (Australian Polytechnic Network)
- Efficient course design with rationalization of units
  - More time for staff to do research
  - Significant reduction in unit/course administration



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# Transforming ICT learning and teaching @ UC

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