Let us start from three stories…

Dr William Liu
School of Computer and Mathematical Sciences
Auckland University of Technology

Imagine a world…

Deeply integrating computation, communication, and control into physical systems

- *Transform the way we live*
- *Drive economic prosperity*
- *Underpin national security*
- *Enhance societal well-being*
- *Users can bet their life on*

Source: Keith Marzullo, NSF, Division Director for Computer and Networked Systems. Image Credit: Nicolle Rager Fuller, NSF

Imagine a world...

Source: http://www.chinanews.com/fz/2015/04-15/7208797.shtml

Imagine a day…

the ability of future
generations to meet their
own needs."

Brundtland Report, 1987

environmentalillnessnetwork.tumblr.com

Image Credit: William Liu @AUT

Imagine a **REAL** story…

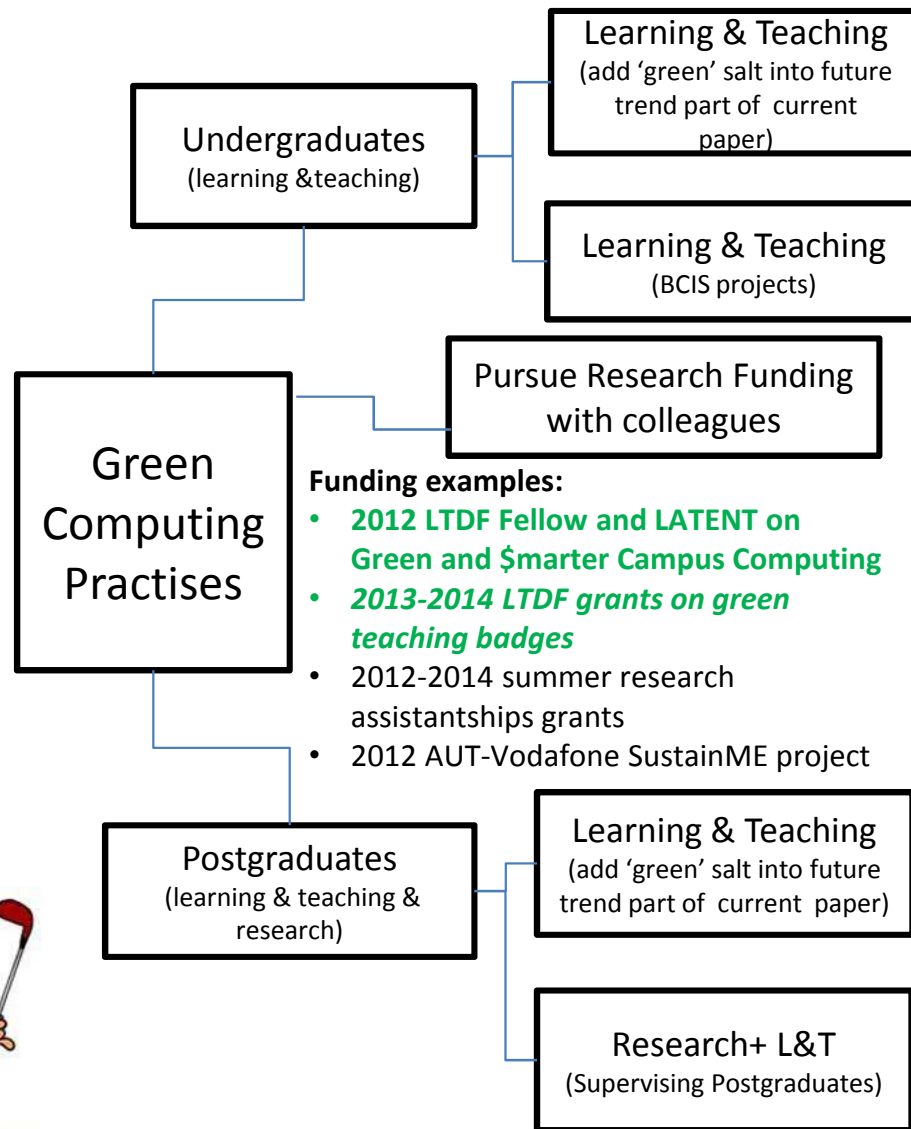Source: Odysseus and the Sirens by Herbert James Draper, c. 1909

Who Am I: Siren, Sailor or Odessxdo?

"What most people need to learn in life is how to love people and use things instead of using people and loving things." - Anonymous

So I should do SomeThing now...

Diagram

Green Computing Practises

- **Undergraduates** (learning & teaching)
  - **Learning & Teaching** (add 'green' salt into future trend part of current paper)
  - **Learning & Teaching** (BCIS projects)
- **Pursue Research Funding with colleagues**

  Funding examples:
  - **2012 LTDF Fellow and LATENT on Green and $marter Campus Computing**
  - *2013-2014 LTDF grants on green teaching badges*
  - 2012-2014 summer research assistantships grants
  - 2012 AUT-Vodafone SustainME project

- **Postgraduates** (learning & teaching & research)
  - **Learning & Teaching** (add 'green' salt into future trend part of current paper)
  - **Research+ L&T** (Supervising Postgraduates)

Text Content

Undergraduate Teaching:
- 406925 Network and System Administration
- 406714 Information Security Technologies

BCIS Final Year R&D Projects:
2011
- Green Routing in Next Generation Networks (NGNs) (3 students - finished)

2012
- Green Routing in NGNs (3 students – finished)
- Green Trade-off Study in NGNs (3 students –finished)
- Green Power Management (3 students - finished)
- Green Cloud Computing I (3 students – finished)
- Green Intelligent Managing Power (3 students- finished)

2013
- Energy Efficient Network Resource management (4 students-finished)
- Green Cloud Computing II (4 students - finished)

2014
- Energy efficient software defined networking (SDN) – (4 students – finished)

Postgraduate Teaching:
- 409113 Cloud Computing in MSoC (4-hour session and 10% assessment)
- 408203 Net-centric Computing (1/2)

Postgraduate Supervisions *(Graduated 1 PhD, 1 MPhil and 3 Masters)*
- 1 PhD student worked in lightweight security key algorithm for WSNs
- 1 MPhil student worked in green routing in NGNs
- 1 Master student worked in energy aware trust routing in SmartGrid
- 1 Master student worked on policy based energy efficient cloud network
- 1 Master student worked in greening mobile cloud computing

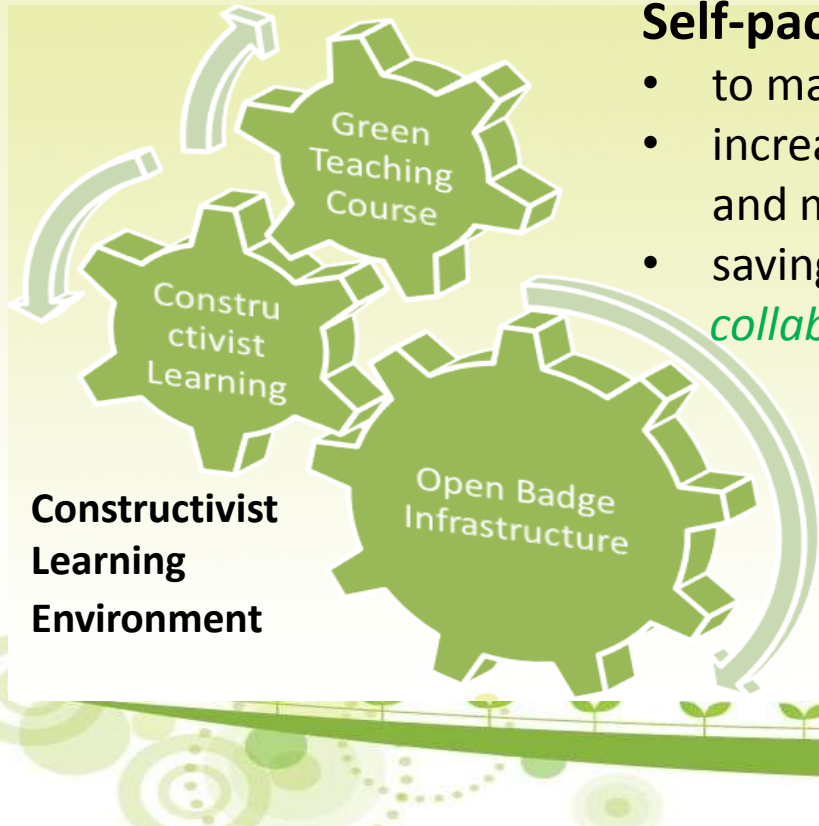- *Currently 5 PhDs and 2 Masters are working on the various green topics*

me...
We....

SCMS Team: William Liu and Stephen Thorpe
CfLAT Team: Mark Northover, Shen Zhang,
Peter Maclaren and Steve Lord

Project Overview

This project is to use **an online course** to achieve the dual goals of promoting awareness of the environmental effects of higher education and maximizing the use of AUTonline tools in teaching by **rewarding** academics for **teaching sustainably** with a Green Teaching Active Leader **badge**, and also the certified green **course logo** displayed with the course title in AUTonline.

**Self-pacing Green Teaching Course**

- to make course delivering ore *sustainably*
- increase the use of *AUTonline course tools* reducing papers, e.g., submit and mark assignments electronically
- saving energy and reducing carbon emissions, e.g., use *online collaboration tools* such as video-conferencing to organize meetings

Green Teaching Course

Constructivist Learning

Open Badge Infrastructure

Constructivist Learning Environment

mozilla OpenBadges

Open Badge Infrastructure (OBI) –Earn, Issue and Display

Mozilla Open Badge Infrastructure
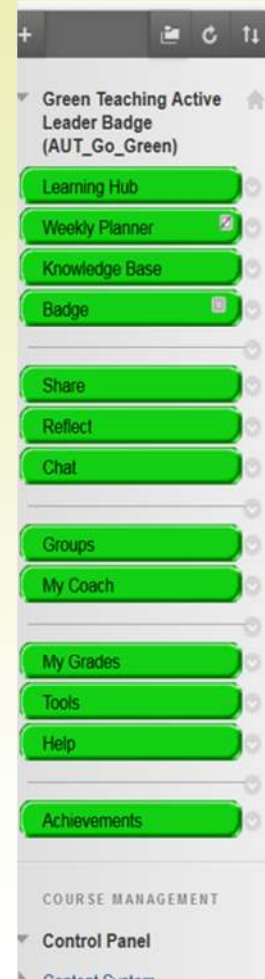## *- A new way of recognizing and rewarding*
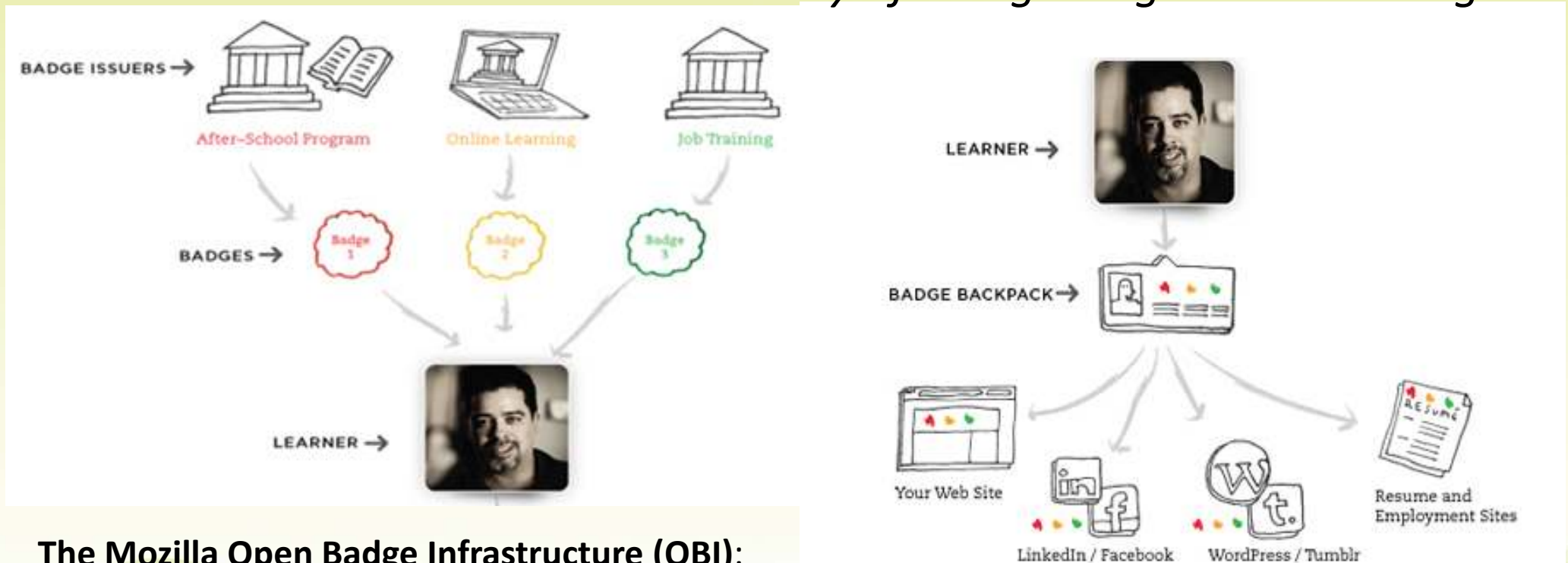
The Mozilla Open Badge Infrastructure (OBI):

- issues digital badges to recognize skills and achievements
- allows online learners to choose from different pathways for knowledge and skill development
- allows to display real-world achievements and skills with formal credit

Source: http://openbadges.org/

Green Teaching Badges Course Design

Step 1
- Green Teaching Awareness Self-assessment Questionnaires (10 questions)

Step 2
- Take a Short Training and Make a 2 month Practice Plan (review other green teaching initiatives and make a practice plan)

Step 3
- Self-review and reflection Questionnaires (12 questions)

Receive Your New Credential
Green Teaching Active Leader Badge

GREEN AUT NZ TEACHING

Green Teaching Active Leader Badge (AUT_Go_Green)

- Learning Hub
- Weekly Planner
- Knowledge Base
- Badge
- Share
- Reflect
- Chat
- Groups
- My Coach
- My Grades
- Tools
- Help
- Achievements

COURSE MANAGEMENT

Control Panel
Content System

Green Teaching Active Leader (GTAL) Badge

Build Content ∨ Assessments ∨ Tools ∨ Partner Content ∨

Green Teaching Active Leader (GTAL) Badge
Enabled: Adaptive Release

Course Overview

Overview

Be a champion for sustainability in teaching in your department, school or faculty. Through earni
raise awareness of teaching strategies, including reducing paper use, saving energy, reducing e

Learning Outcomes

With the convenience of the AUT e-learning platform AUTonline, this course provides in-depth su

- Explain how the concepts of sustainability apply to teaching and drive sustainability innov
- Integrate sustainability into your paper's curriculum;
- Engage with proven approaches to establish sustainable teaching operations, by using e-classroom and online collaboration tools in AUTonline; and
- Boost student satisfaction through best practice and implementation strategies to create a

Earn Your Green Teaching Active Leader (GTAL) Badge

This GTAL badge can be achieved by implementing the following learning activities step by step

Step 1: GTAL Awareness Self-assessment Questionnaire

Step 2: Take a Short Training Activity and Make a 2-month Green Practice Plan

Step 3: GTAL Self-review and reflection Questionnaire

Quiz Questions and Requesting Green Certified Course

Quiz question example

Request students to submit their assignments via AUTonline

- ❑ Most of the time
- ❑ Some of the time
- ❑ **Never**

Response Feedback: If you would like to know more about
how to create an online assignment, please read the instruction <u>here</u>

Requesting Green Certified Course

Copying 409113_2012_01Cloud Computing 2013 Semester 1

Course Code: 409113
Year: ▼
Semester: ▼
Suffix (Optional):
Course name: Cloud Computing 2013 S
Copy discussion forums & threads: ☑
Copy announcements: ☐
Achieve the Green Active Leaner Badge
using this Couse ☐

new sustainable course
checkbox

Save   Cancel

Blackboard learn⁺

Creating and Editing Assignments

Assignments allow you to create coursework and manage the g
separately. In an assignment, you can include a description, po
create assignments in several courses areas, such as in a conte
folder. Students access the assignment, type a submission, att
to each student separately with comments and attached files.

You can distribute assignments to course groups. To learn mor

Note: You grade submitted assignments in the Grade Center. T
Grading Assignments.

How to Create an Assignment

1. Change **Edit Mode** to **ON** and access the course area wh
2. On the action bar, point to **Assessments** to access the d
3. Select **Assignment**.
4. On the **Create Assignment** page, type a **Name**. Studen
   access the assignment.
5. In the **Instructions** box, you can format the text and in
   and attachments using the functions in the content editor
   editor can be launched in a new window and have alterna

Tip: Be sure to remind students to attach any required fil
s are

My Current Courses

For your previous courses please look under the "All My Courses" tab at the top

🌱 405706_2013_01   Computer Networking (Sem 1 2013)
   406714_2013_FYC1   Information Security Technologies
🌱 406925_2013_01   Network and System Administration Sem 1, 2013
   407008_2012_02   BCIS Project Semester 2, 2012
   407008_2013_01   BCIS Project Semester 1, 2013
   407708_2013_01VN   Information Security Management C4 / VN (Jan 2013- June 2013)
🌱 409113_2013_01   Cloud Computing 2013 Semester 1

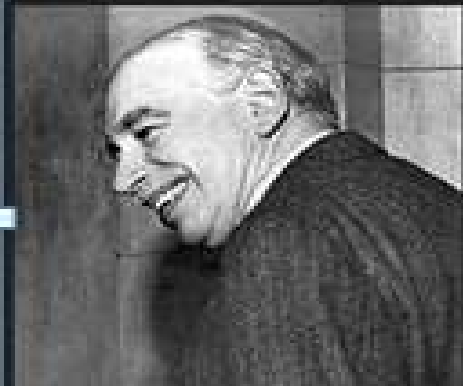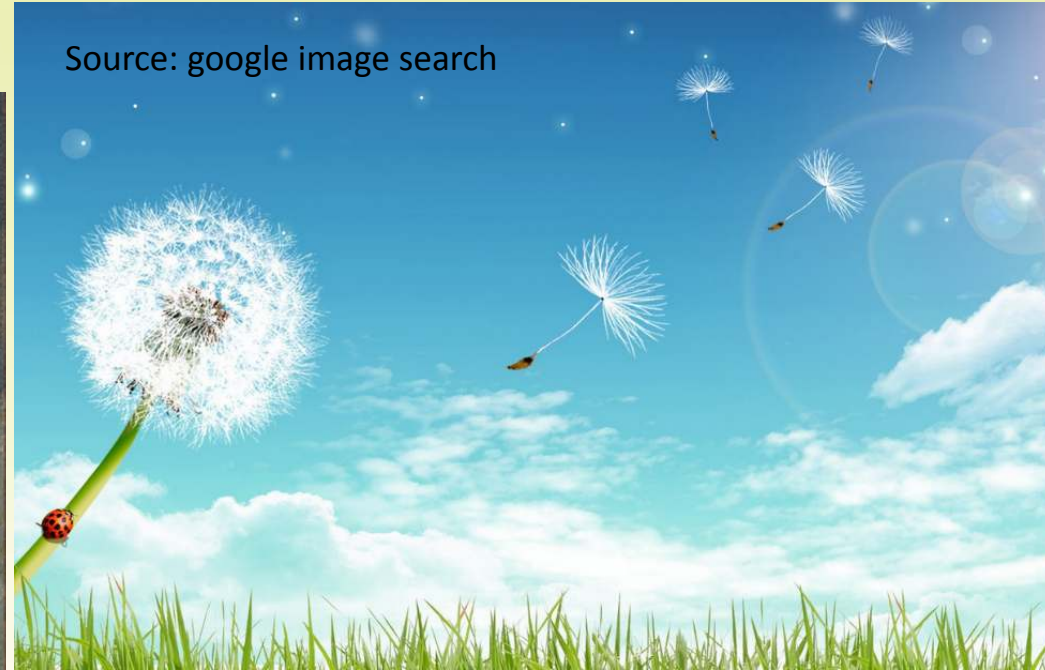# Professional Footprint...

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Or let us become more brave to be Orpheus....? !

> The difficulty lies, not in the new ideas, but in escaping from the old ones, which ramify, for those brought up as most of us have been, into every corner of our minds.
>
> (John Maynard Keynes)

Questions are guaranteed in life; Answers aren't.