“Future Challenges in Delivering Agromet Outputs to Farmers”

Professor Roger Stone
and
Professor James C Taylor AM

University of Southern Queensland
Enrolled Students USQ 2008

- All students: 24,756
- On-campus: 6,213
- Off-campus (Australia): 12,292
- Off-campus (Overseas): 6,251
USQ’s International Students 2008

- China 1,733
- Malaysia 1,337
- India 659
- Nepal 572
- Singapore 405
- Sri Lanka 328
- Fiji 225
- South Africa 217
- Canada 187
- Taiwan 134
- Indonesia 125
- United Arab Emirates 121
- Russian Federation 104

Total, incl. students from 87 other countries 7,403
The Consumer Context

At current rates of growth, the number of students in post-secondary education worldwide will double in less than ten years.

Source: Alex Usher, Educational Policy Institute, January 2007
Shortage of Teachers

The world will need 18 million new teachers in the coming decade in order to meet demand worldwide for primary education....

Source: UN Website 5 October, 2006
To meet the demand for higher education......

"India alone would need nearly 2,400 additional universities in the next 25 years - or roughly two new universities per week."

Source: Daniel, Kanwar, Uvalić-Trumbić (2007)
Education is a Process, Not a Place

In both developed and developing countries:

the Internet will provide the only viable cost-effective means to meet the demand for education and continuing professional development.
Economic Driver for Change

'The death of distance as a determinant of the cost of communications will probably be the single most important economic force shaping society in the first half of the 21st century'.

Cairncross (1997)
The Consumer Context:
Web 1.0….. Web 2.0 …..Web 3.0

Next-Generation E-Learning Environment

Source: Adapted from Jafari et al., 2006, S. 62
USQ’s 2020 Vision

To be recognised as a world leader in

open and flexible higher education
2004 Commonwealth of Learning Award of Excellence for Institutional Achievement in Distance Education

2000 – 2001 Australia’s Good Universities Guides’ Award for Developing the e-University

1999 ICDE Institutional Prize of Excellence for Dual Mode Operations
Five Generations of Distance Education Technology

- The Correspondence Model
- The Multimedia Model
- The Telelearning Model
- The Flexible Learning Model
- The Intelligent Flexible Learning Model
### MODELS OF DISTANCE EDUCATION AND ASSOCIATED DELIVERY TECHNOLOGIES

<table>
<thead>
<tr>
<th>THE CORRESPONDENCE MODEL</th>
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<tr>
<td>• Print</td>
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### CHARACTERISTICS OF DELIVERY TECHNOLOGIES

<table>
<thead>
<tr>
<th>FLEXIBILITY</th>
<th>HIGHLY Refined MATERIALS</th>
<th>ADVANCED INTERACTIVE DELIVERY</th>
<th>INSTITUTIONAL VARIABLE COSTS APPROACHING ZERO</th>
</tr>
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<tbody>
<tr>
<td>Time</td>
<td>Place</td>
<td>Pace</td>
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</table>

**First Generation (Asynchronous)**

- Print
## Second Generation (Asynchronous)

<table>
<thead>
<tr>
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<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>Time</td>
<td>Place</td>
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<tr>
<td>THE MULTIMEDIA MODEL</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>• Print</td>
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<td>Yes</td>
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<tr>
<td>• Audiotape</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>• Videotape</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>• Computer-based learning (eg CML/CAL)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>• Interactive video</td>
<td>Yes</td>
<td>Yes</td>
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</table>
### Third Generation (Synchronous)

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>THE TELELEARNING MODEL</strong></td>
<td>FLEXIBILITY</td>
<td></td>
</tr>
<tr>
<td>• Audio-teleconferencing</td>
<td>No</td>
<td>No</td>
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<tr>
<td>• Videoconferencing</td>
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<td>No</td>
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<tr>
<td>• Audiographic communication</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>• Broadcast TV/Radio and Audio-teleconferencing</td>
<td>No</td>
<td>Yes</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Place</th>
<th>Pace</th>
<th>Highly Refined Materials</th>
<th>Advanced Interactive Delivery</th>
<th>Institutional Variable Costs Approaching Zero</th>
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<tbody>
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<td>Time</td>
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<tr>
<td>Interactive multimedia (IMM)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Internet-based access to WWW resources</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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<tr>
<td>Computer mediated communication (CMC)</td>
<td>Yes</td>
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# Fifth Generation (Asynchronous)

## Models of Distance Education and Associated Delivery Technologies

### The Intelligent Flexible Learning Model
- Interactive multimedia
- Internet-based access to WWW resources
- CMC, using automated response systems
- Campus portal access to institutional processes & resources
- Webcasting and the Live Online Classroom

### Characteristics of Delivery Technologies

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**Fifth Generation (Asynchronous)**

- Yes
- No/Yes

**INSTITUTIONAL VARIABLE COSTS APPROACHING ZERO**

- Yes
Need for Continuing Research, Development & Innovation

“The single greatest challenge facing managers in the developed countries of the world is to increase the productivity of knowledge and service workers”

Source: Peter Drucker (1991)
USQ Institutional Context 2008

Australian Digital Futures Institute

Software Research & Development Lab

Technology Enhanced Learning Laboratory

http://www.usq.edu.au/adfi/
Managing the fixed costs of courseware design and development

Integrated Content Environment (ICE)

**RENDITIONS:**
- Print
- Web
- CD
- DVD

**OPEN SOURCE SOFTWARE**

**CONTENT REPOSITORY:**

- XML based content management

**INPUT:**

- Word processor (Microsoft Word or OpenOffice.org)

USQ’s Open Source e-Publishing System
Managing the Variable Costs of Academic Support

Incoming “new” academic question from student

Metadata Schema Model

Search / Match

Reusable Learning Objects
Academic Content Repository
Previous Questions <meta tags>
Previous Answers <meta tags>

Duty Tutor

“Immediate” academic feedback to student

New Answer

Trigger

YES

NO
Welcome to CAIRSS

CAUL Australian Institutional Repository Support Service.

The primary function of CAIRSS is to offer support for Repository Managers in the higher education sector in Australia.

Following discussions with the Department of Innovation (DIIOR) the Council of Australian University Librarians (CAUL) Executive, and the ARROW Management Committee, CAUL established the CAUL Australian Institutional Repository Support Service (CAIRSS), to provide support for all institutional repositories in Australian universities, regardless of the software being used.

CAUL appointed the University of Southern Queensland, through the Australian Digital Futures Institute (ADFI) within the Division of Academic Information Services (DAIS) to undertake its new institutional repository support service.

The service commenced officially on March 16, 2009.

Announcement 18/3/2009: CAIRSS – supporting access to university research
Roles for Virtual Worlds

Context
Lifelike and virtually real

Community
Relationships with teachers, students, alumni, colleagues, experts, practitioners, researchers, business, employers, the public

Material
Manipulate and create digital materials for creative expression, machinima (film making) & visualization

Combinations
Mix and match these roles to create authentic tasks, improve presence for distance learners, improve communication or connect to a wider audience

Source: Adapted from Lindy McKeown, PhD candidate, USQ, 2008
A Strategic Approach is Critical

Organisation
Flexible and efficient structures and processes

Technology
Stability, adequate functionality

Culture
Readiness for change and innovation

Economics
Efficient utilisation of resources

Human Factors Interface
Engaging Interactive Environments

Source: Adapted from Seufert/Euler, 2003
World Meteorological Organisation
Project Overview
Climate Forecasts for Agricultural Decision Making

AIM:
To Improve Food Production (Food Security)

Agricultural Models

Climate Models

AG Organisations

Communications Information Services
Online Training Services
Evaluation

Climate Organisation

Localised

Mediator

Farmers (Specific Target Groups)

Localised

Mediator
The value of climate forecasts to users will depend not only on their perceived ‘accuracy’ but also on the management options available to the user to take advantage of information (Nicholls, 1991).
“Seasonal climate forecasting has no value unless it changes a management decision”

How much Nitrogen to apply given current low soil moisture levels and low probability of sufficient in-crop rainfall?

Which variety to plant given low rainfall probability values and high risk of damaging frost and anthesis?
The Farmer Decision Process

• Part of daily operations on farm and life
• Focuses on a “decision points” - how much fertilizer, how much area to plant, alternative crops, when to plant, likely returns, whole farm decisions…….
• Judgment on weather and climate impact on decision
• Discussion with neighbours, agronomists and other experts.
• Assessment of various options that take into account the above.
USQ Online Extension-Development

- Provide an online discussion support tool for farmers
- Enable real time (SMS alerts/synchronous chats)
- Discussion prompts/scenarios driven by climate-based information
  - SST / SOI / agronomic information
  - Production of climate/ag-relevant scripts and scenarios
- Use of 2nd Life to replicate simulated environments
  - Addresses cultural and language issues
My Farm Weather Plots (weekly/monthly/yearly)

- Register your mobile phone for up-to-date weather alerts?

- What are the rainfall probabilities for the next 3 months?

- What is the Climate Outlook for the next 3 months (until March 2009)

- Talk to fellow farmers? (Click here)

- How can I improve my crop yields for the next 3 months? (updated Nov 2008)

- Want to learn more about climate? (Click here)

To My Farm

To My Resources
Case Study Examples
Managing the winter

- **Scenario 1**
  Northern Darling Downs, Qld, Australia

- **Scenario 2**
  India

- **Scenario 3**
  Northern Darling Downs, Qld, Australia
Acknowledgements

- Prof Jim Taylor, Lindy McKeown, Shirley Reushle, and DeC/ADFI staff
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- Dr Ian Bell, Jeff Wilson - WMO
- Stephen Lellyett - BoM