


## Improving learning outcomes through ICT based learning designs


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## Where in the world is Wollongong?



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## Where is Wollongong?




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## What is Wollongong?

- Regional university
- 20,000 students spread across 3 campuses and 5 access centres - 30% international students
- Engineering, Commerce, Informatics, Science, Health & Behavioural Science, Law, Creative Arts, Arts, Education




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# CEDIR

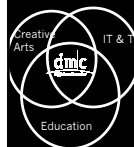
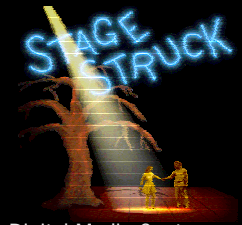
*'supporting teaching & learning'*

cedir.uow.edu.au


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## Faculty of Education

- Educational Media Lab (emlab):
  - Multimedia R&D enterprise
  - Projects manager; 5 programmers; 1 graphic artist; 1 admin

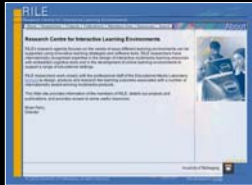



- Digital Media Centre
  - Collaborative, multi-disciplinary digital media R&D
  - Partnerships with government and industry
    - among UOW staff across faculties
    - with other Universities - Australia and international
  - Director/Associate Director (PT),
  - Research Fellows (2), Senior Research Assistants (2), Research Assistants (1)

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## Research in Interactive Learning Environments (RILE)

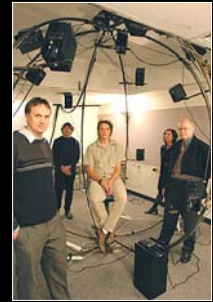
- Sits within UOW technology research strength
- +15 academics; 3 research fellows; +25 HDR students
- Research agenda extended to how the range of ICT facilitate learning
  - Teacher education and development
  - Adult and continuing education
  - Authentic learning
  - Collaborative learning
  - Case-based learning
- [rile.uow.edu.au](http://rile.uow.edu.au)




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## 3D Sound Studio

- Immersive sound environment consisting of a 16-speaker loudspeaker array
- Composition and transmission of 3D sound and music.
- Research perception of sound in a 3D environment




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## Interactive Television

- Explore creative, educational and technological issues associated with interactive television
- Sun Centre of Excellence for Digital Media
- Collaborate with partners




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## Continuing Ed: Dual Diagnosis

- Collaboration with local divisions of General Practice, Illawarra Institute of Mental Health, Illawarra Health Service
- Professional development for GPs on issues of mental health and substance abuse
- Case-based learning
  - typical presentations
  - not-just-best practice
  - meta-cognitive considerations through gp discussion



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## New technologies in K-12 contexts

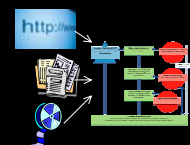
- Sydney Olympic Park
  - High school geography challenges
  - School excursion program
- Energy balance: interactive game
  - Eating/activity habits; Nutrition and activity 'choice spaces'; Game ideas
  - Prototype of a game component
  - Evaluation: Children's understanding of balance and ideas for further development; Teachers' and parents' perspective
- Schools News
  - Construction of digital video news to support multi-literacy
  - Online advice from news professionals




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## Smart Learning Design Framework

- Investigate how learning objects can be used
  - Constructivist learning environments
  - Higher Education context
- Provide a framework to help users create quality learning experiences
  - Learning Designs
- Develop a system to guide the selection and aggregation of learning objects
  - Electronic Performance Support System



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## Learning Designs - Higher Education

- Funded by Australian Universities Teaching Committee
  - Identified high quality learning designs in HE
  - Selected designs suitable for redevelopment in generic form
  - Described as tasks, resources and supports
  - Developed those as reusable products
    - Software tools
    - Templates
    - Guidelines
- [www.learningdesigns.uow.edu.au](http://www.learningdesigns.uow.edu.au)



## The project

- information and communication technologies and their role in flexible learning
- project aims
  - to maximise opportunities for university teachers to create high quality, flexible learning experiences for students
  - to create reusable resources based on generic learning designs
  - to facilitate uptake of the learning designs by Australian university teachers

## Project strategies

- identify learning designs which contribute to high quality learning experiences
- select learning designs which have potential for redevelopment as reusable templates
- produce a redevelopment plan and costing
- undertake the development of some learning designs in a generic form
- develop a series of guidelines for good practice in the use of the templates in new contexts

## Project participants

- core team
  - Barry Harper, Ron Oliver, John Hedberg, Sandra Wills, and Shirley Agostinho (project manager)
- research team
  - Jan Herrington, Catherine McLoughlin, Lori Lockyer, Gary Hoban
- AUTC steering committee
  - Shirley Alexander, Diana Laurillard, David Rich, Sue Johnston
- international reference group
  - Tom Reeves, Betty Collis, John O'Donoghue, Peter Twining, Erik Duval, Chuck Schneebeck, Curtis Bonk

## Project overview

- *learning designs*  
student learning experiences: may be at the level of a whole course, program, subject, or modules
- *high quality learning experiences*  
experiences which encourage students to seek understanding and which encourage the development of lifelong learning skills
- *flexible learning*  
meets the diverse needs of students, focuses on how ICT can be used for flexible opportunities for students

## Evaluation framework

- to facilitate the identification of learning designs that foster high quality learning experiences; and
- to provide a mechanism to determine whether such learning activity designs have the potential for re-development in a more generic form.

## Principles and assumptions

A high-quality learning environment should be one in which:

1. learning activities support learner engagement
2. learning activities acknowledge the learning context
3. learning activities seek to challenge learners
4. learning activities provide practice

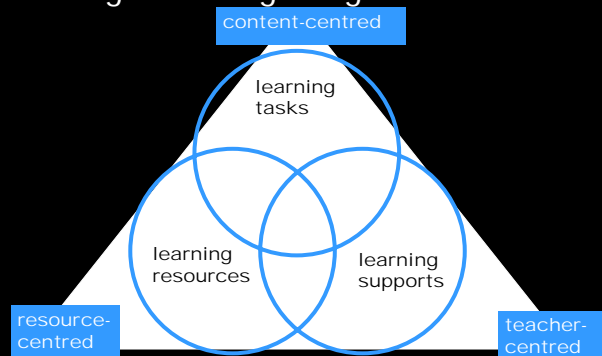
(Boud, D., & Prosser, M. (2002).

Appraising new technologies for learning: a framework for development. *Educational Media International*, 39(3/4), 237-245)

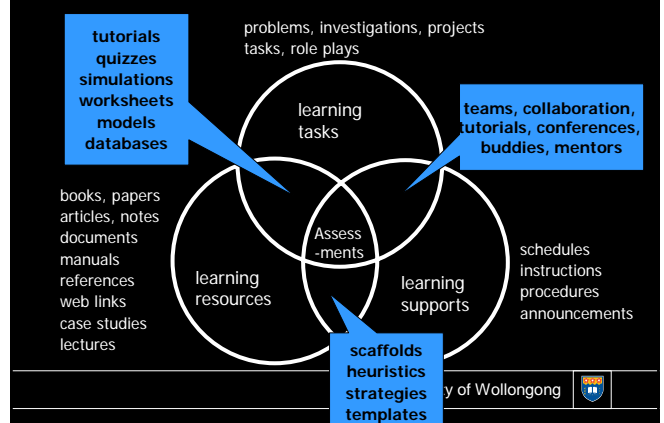
## Reviewing learning designs

- 52 learning designs submitted
  - diversity of learning outcomes
  - variety of ICT
  - range of discipline areas
  - documented quality
- 64 volunteer evaluators

## Framing e-learning designs



## Constituent elements



## Challenges

- isolating learning design from context
- level of granularity
- particular teacher dependent
- design reusability
- identifying key attributes
- generic templates or shells
- judging transferability to other domains
- ➔ • dissemination and supporting change

## Dissemination initiatives (RILE)

- Exploring new models of professional development: diffusion and adoption of a teaching innovation repository.
- Investigation of the Dissemination of a Repository of High Quality Tertiary Teaching and Learning Ideas and Resources.

## Key outputs include

- The Boud and Prosser principles for high quality student learning in Higher Education (Boud & Prosser, 2001, 2002).
- [The Evaluation and Review Framework \(ERF\)](#).
- [The Learning Design construct](#) (Oliver, 1999, 2001; Oliver & Herrington, 2001).
- The Learning Design Sequence construct.
- A Learning Design Classification Framework.

## Four generic software tools

- Investigation eShell.
- [Predict-Observe-Explain eShell](#).
- Online Self and Peer Assessment Tool.
- VisChem Molecular–Level Construction Tool.

## Generic guidelines to assist the design, development and implementation of the following learning designs

- [Explore, Describe, Apply](#): A problem focussed learning design. – [1](#), [2](#), [3](#)
- En-Role, Research, React, Resolve, Reflect: Developing and using online role-play learning designs.
- Review, Select, Compile and Argue: A problem focussed learning design.
- Review, Access, Question, Decide, Report, Reflect: Structured Problem Solving.
- Observe, Represent, Refine: Developing scientifically-acceptable mental models of non-visible physical phenomena (based on VisChem).

- [Learning Design Exemplar descriptions \(32\)](#): Each description is accompanied with its own Learning Design Sequence. These descriptions can serve as implicit guidelines.
- [1](#), [2](#), [3](#)

## Recommendations for further research and development

- Additional learning designs
- Site evaluation
- Dissemination and support
- Explore metadata descriptors for learning designs
- Determine the quality of learning designs, possibly through peer review
- International links eg SOuRCE Project
- Electronic performance support system (EPSS)