

INTRODUCING E-SIMULATIONS

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New teaching and learning challenges

ACTIVITY

Do you agree with the following observations which have been made by teachers on newer generations of students:

- They have less time for everything
- They pay less attention (to authority?)
- They demonstrate less persistence and endurance
- They see less need for deep knowledge
- They have less fear of failure, and are always open to options
- They see their new wealth as buying results and act like pragmatic customers or consumers of (educational) services
- They undertake a critical rating of benefit for effort expended
- They consistently value friends and networks

If so, what implications do such observations have for fostering student learning?

In relation to higher education, Oblinger and Oblinger (2005) highlight that Net generation (or Generation Y, those born on or after 1982) learning preferences as:

- being strongly team and peer-to-peer based, i.e. seek out help from their friends and gravitate towards team approaches;
- demanding engagement and experience, i.e. they like to learn by discovery and doing things;
- being strongly visual and kinesthetic, i.e. they are visual communicators and like to be physically immersed in their work;
- wishing to learn things that matter, i.e. they switch off quickly from things that don't interest them and that don't seem relevant to their world.

What clues do these observations give us about designing and operating contemporary online-supported teaching and learning environments? If, as Oblinger and Oblinger (2005) argues, the Net generation wishes their learning experience to be digital (while still valuing highly effective forms of interpersonal, face-to-face communication), connected, experiential, immediate and socially based, then what implications does this have for the appropriate development and use of technologies in higher education?

What is a simulation?

Simulations attempt to approximate but not necessarily replicate real-world situations in order to develop desired capacities. We believe that good simulations establish a new '**learning relationships**' with students, inviting

engagement in roles and situated professional knowledge-building rather than abstract content learning. Students use cognitive and practical technology skills (in the case of e-simulations) to identify and solve dilemmas that challenge their knowledge, values and emotions. Good simulations, therefore, also consciously operate on a personal level. So for example, in one e-simulation developed at Deakin called *HOTcopy*, the 'Hot' in *HOTcopy* is intended to convey that it is an intense experience embracing the emotional dimension of learning.

Simulations are seen then as an important educational strategy in providing authentic teaching and learning experiences, that is, real-life type situations eliciting and developing a range of cognitive, emotional and behavioural capacities of relevance to the effective and creative use of academic knowledge in practice settings.

ACTIVITY

This might sound counter-intuitive but...

Could a simulation be a better **educational** experience than participating in an actual workplace learning scheme, e.g. clinical placement, practicum, internship community service, industry-based learning?

List the advantages and disadvantages of each type of approach to developing practical and generic skills.
How might the two work effectively together?

What are the advantages of creating electronic simulations?

In recent years authentic learning, immersive environments, participatory learning, experiential learning have been keywords in contemporary educational practice. The development of the use of simulations and gaming for educational purposes goes right back to the Greeks and were the focus of the instructional design discipline since the 1950s and 1960s. Simulations are not a new educational approach. However, the value of simulations, the pedagogy, has received new attention in the digital age.

The renewed interest is partly a backlash to less informed attempts to exploit the potential of new technologies in education. The mere conversion of learning resources from print and traditional media to the digital/internet format, is being seen as amounting to nothing more than the 'the delivery' of content based on a transmission model of teaching. As a framework for using the new technologies creatively it is incompatible with the design of good experiences for learners.

On the positive side, people are revisiting the application to simulations and games to educational concerns as a result of the convergence of all the technologies to the digital and the ability now with smart data bases and the like to:

- *customise* (by this we mean...can be adapted to meet broadly anticipated curriculum, teaching and learning needs and purposes),
- *personalise* (by this we mean...can be adapted to meet certain personal preferences when interacting with the simulation environment, the manner in which the simulation presents itself to the learner and addresses the learner),
- *individualise* (by this we mean...that a simulation may collect data on me and use the data to predict my needs and adapt its behaviour accordingly. It may also allow me to take greater control over certain events in order to meet my own learning needs).

the learning experiences of our students.

The use of the term e-simulation tends to denote a simulation that is mostly delivered online, although digital simulations may be delivered via different computer-based media. These are to be differentiated from simulations conducted in the physical world. The types and purposes of real-world simulations are many and varied. Fire crews simulate responses to nonexistent fires, in order to practice and learn from critical events in team-based responses to rapid, coordinated action. Taking simulations online can enable a more powerful and flexible learning experience.

There are two major ways in which e-simulations can be constructed:

- those which are substantially internet enabled, able to detect whether the student has got an internet connection and hence the simulation is largely from the Net connection;
- those which need to accommodate students (e.g. off-campus) who require a CD where they get their heavy media accompanied by a small amount of internet functionality for modifying an existing scenario on the CD through an appropriate web link.

More specifically, the advantages and, indeed, disadvantages of one form of e-simulation relating to simulated interviews undertaken by a Deakin staff member in the field of information systems has been summarised as follows:

Advantages:

- They are interactive, stimulating and enjoyable for learners
- They allow single-user or team interaction
- They provide realistic or real-world scenarios
- They enable controlled and predictable outcomes
- They promote trial-and-error learning in a risk-free setting
- They reduce face-to-face time and teaching resources
- They provide the basis for further discussion.

Disadvantages include:

- They can be expensive and time-consuming to build

- They are often context and discipline specific
- They may require extensive technical skills
- As a result, best to focus on non-volatile concepts and ideas.

Show me something of an e-simulation in action

View the following document <http://www.deakin.edu.au/itl/pd/tl-modules/assessment/documents/hotcopyjournal2.pdf>

What are some of the benefits of authentic teaching and learning experiences like the recent Deakin e-simulations?

Simulations provide five important benefits as they relate to the provision of authentic teaching and learning experiences:

1. **Flexibility** in the use of such resources in the campus computer lab, at home or at work; either individually or in groups; and either informally or formally with teacher support.
2. **Quality** learning and teaching environments based on:
 - experiential learning;
 - problem-based learning;
 - active and reflective professional practice;
 - scaffolding from experts;
 - elements of cognitive apprenticeship theory;
 - employer validation of authentic workplace experience.
3. **Relevant** learning and teaching resources providing valued integrated treatments of professional matters applicable to:
 - pre-service undergraduate students;
 - internship preparation by students;
 - in-service and pre-service post-graduate students;
 - mid-career practising professionals;
 - workplace trainees.
4. **Responsive** learning and teaching enactment of curriculum that responds to:
 - student requests for motivating and meaningful learning in relation to their planned career;
 - university and profession requests for the comprehensive integration of ethical, legal and other dimensions of professional practice into students' learning experiences in higher education;
 - pressures from employers, professional associations and trainees for more rigorously 'workplace-relevant' learning experiences signified by factors such as working under deadline pressures and having to negotiate management and personal dimensions of the workplace;

- staff expressed needs such as relatively small staff numbers and limited work placement opportunities, staff aimed to reduce intensive, face-to-face teaching that not always provides appropriate experiences for the skills being developed.

5. Innovative learning and teaching technology that:

- provides learners and teachers with a resource for use as a once-only experience, multiple practice experiences or for tests and exams;
- uses a flexible and extensible *simulations* model and database of *media objects* enabling rapid creation, revision and customisation of simulation resources;
- maximises the benefits from synergies created by combining existing, but very recent digital, multimedia technologies;
- has the underlying design for future connection to Deakin Studies Online (DSO), for downloading enhancements or variations to the existing simulations on published CDs;
- motivates first year students, communicating to them that Deakin University and specifically that the simulation development and teaching teams place a high priority on engaging, interactive and contemporary educational technologies.

Who are the key stakeholders with potential interests in e-simulations?

E-simulations are often developed in a response to requests from:

- **students** for motivating and meaningful learning for their planned careers;
- **faculty staff** and the **profession** for the integration into students' university experiences of challenging professional dimensions;
- **employers** and **trainees** for more rigorously workplace-relevant learning experiences such as, for example, in the case of the HOTcopy e-simulation in journalism, writing news worthy 'copy' under deadline pressures.

How does their development relate to Deakin policies?

Deakin's teaching and learning related policies refer directly to initiatives that for example:

- **Demonstrate applications of theory to practice in real or simulated situations.**
- **Foster active learning and application of knowledge with projects,**

case studies, problem-solving exercises, problem-based learning and hypotheticals.

- Give students insight into how knowledge is created in the field through computer-based modeling and knowledge construction processes.
- Recognise the social justice issues, ethical practices and legal considerations pertinent to the field of study.
- Provide opportunities for experiential learning that are designed to develop specific understandings of external contexts.
- Interpret and solve problems appropriate for a beginning professional within the discipline.
- Demonstrate knowledge of typical problems met at initial levels of practice.
- 'Assign professionally relevant case studies, simulations and projects.'

ACTIVITY

One key policy is the ATTRIBUTES OF EXCELLENT TEACHING and accompanying Procedure:

The Policy states that: The attributes of excellent teaching form the basis for the assessment of teaching and teachers at Deakin, including the evaluation of teaching and units, the performance planning and review process and the academic promotion process.

You might wish to undertake this activity if:

- You've had previous experiences of either paper-based or e-simulations
- You are considering the design of an e-simulation
- You have completed the development of an e-simulation

Indicate with a 'Yes' or 'No' whether your simulation addresses each one of the attributes of excellent teaching as listed in the Deakin policy.

| | <i>Simulation</i> |
|---|-------------------|
| (A) Underpins practice by scholarship | |
| 1. Shares and stimulates understanding of existing scholarship in the field. | |
| 2. Recognises the integration of, and connections between, teaching, learning and research. | |
| 3. Participates in professional activities and research related to teaching. | |
| 4. Adopts a professional and systematic approach to teaching development. | |
| 5. Critically reflects on his/her own work. | |
| 6. Seeks feedback and uses evaluation to improve the quality of future work. | |

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| (B) Incorporates sound principles of teaching | |
| 1. Uses appropriate design and delivery of content and course materials which maximise the use of diverse learning environments and a variety of communication modes. | |
| 2. Chooses curriculum content that considers a variety of perspectives. | |
| 3. Organises course material effectively and presents it cogently and imaginatively. | |
| 4. Demonstrates a command of subject matter, including the incorporation of recent developments in the field of study. | |
| (C) Supports students and their learning | |
| 1. Guides and advises students effectively and empathically. | |
| 2. Respects diverse talents and ways of learning and engenders respect for intellectual diversity. | |
| 3. Assists students from equity groups to participate and achieve success in their courses. | |
| 4. Communicates high expectations and encourages students to do their best. | |
| 5. Provides appropriate assessment, including the provision of worthwhile feedback to students on their learning and guidance about what to do to improve their performance. | |
| (D) Adopts an inclusive and learner-centred approach | |
| 1. Demonstrates interest and enthusiasm for teaching and promoting student learning | |
| 2. Arouses curiosity and stimulates independent learning and the development of critical thought. | |
| 3. Encourages and develops co-operative and collaborative learning. | |
| 4. Recognises and builds on the knowledge, skills and experience that learners bring. | |

An example of the completion of this activity can be found for the e-simulation HOTcopy developed for Journalism. The work of the HOTcopy team and creation of the curriculum resource represent key attributes of excellent teaching as follows:

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| | HOTcopy |
| (A) Underpins practice by scholarship | |
| 7. Shares and stimulates understanding of existing scholarship in the field. | |
| 8. Recognises the integration of, and connections between, teaching, learning and research. | |
| 9. Participates in professional activities and research related to teaching. | |
| 10. Adopts a professional and systematic approach to teaching development. | yes |

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| 11. Critically reflects on his/her own work. | |
| 12. Seeks feedback and uses <i>evaluation to improve</i> the quality of future work. | yes |
| (B) Incorporates sound principles of teaching | |
| 5. Uses <i>appropriate design and delivery of content and course materials</i> which maximise the use of diverse learning environments and a variety of communication modes. | yes |
| 6. Chooses curriculum content that considers a <i>variety of perspectives</i> . | yes |
| 7. Organises course material effectively and presents it <i>cogently and imaginatively</i> . | yes |
| 8. Demonstrates a command of subject matter, including the incorporation of <i>recent developments in the field of study</i> . | yes |
| (C) Supports students and their learning | |
| 6. Guides and advises students <i>effectively and empathically</i> . | yes |
| 7. Respects diverse talents and ways of learning and engenders respect for intellectual diversity. | |
| 8. Assists students from equity groups to participate and achieve success in their courses. | |
| 9. Communicates <i>high expectations and encourages</i> students to do their best. | yes |
| 10. Provides <i>appropriate assessment</i> , including the provision of <i>worthwhile feedback</i> to students on their <i>learning and guidance</i> about what to do to improve their performance. | yes |
| (D) Adopts an inclusive and learner-centred approach | |
| 5. Demonstrates <i>interest and enthusiasm</i> for teaching and promoting student learning | yes |
| 6. <i>Arouses curiosity and stimulates independent learning and the development of critical thought</i> . | yes |
| 7. Encourages and develops <i>co-operative and collaborative</i> learning. | yes |
| 8. Recognises and <i>builds on the knowledge, skills and experience</i> that learners bring. | yes |

Working through the checklist is useful in:

- Thinking about appropriate opportunities for designing e-simulations
- Reviewing first iterations of e-simulation development
- Promoting effective e-simulation development as part of academic promotion, and university and national teaching awards.

How and when can they be used?

An important stance taken in the conceptualisation, design and use of e-simulations in Deakin is commonly termed 'Blended Learning'. Generally this term denotes an approach the 'blends' educational activities that occur in the physical environment with those taking place in the virtual learning environment (online). For e-simulations this means that the simulation has

been created for use in a university teaching and learning context involving a range of other critical activities in the wider learning environment. For example:

- Classroom introduction to the simulation involving orientation to the task (especially if it involves assessment);
- Practice on the task in a group;
- Rationale for the challenges in the simulation;
- Explanations of independent / individual learning applications such as for preparation for internships or exams;
- Debriefings and feedback about the roles and tasks undertaken by the student in the simulation;
- Collaborative work and discussions between students who have used the simulation;
- Individual feedback on any assessable component in the simulation.

The purpose of simulations in the curriculum and assessment of units at Deakin, and the timing of their use in the progression of a normal semester, vary greatly, reflecting the 'embedded' and 'contextual' nature of the application of e-simulations in the educational intentions of university teachers.

The following are further indications of ways to respond to the contextual demands of using e-simulations in the university:

Via a combination of delivery and support platforms

- Stand-alone using CD only
- Combination of CD and online e-sim site
- Combination of CD, online e-sim site and DSO
- Combination of CD, online e-sim site and social software environment

For different student groups:

- pre-service undergraduate students;
- internship preparation by students;
- in-service and pre-service post-graduate students;
- mid-career journalists;
- workplace trainees.

In different physical locations:

- At home
- At work
- In student residences
- In on-campus student computer labs

In different human relationships:

- Alone unsupervised by teachers
- With fellow students unsupervised by teachers
- With fellow students in tutes/computer labs supervised by teachers
- With work colleagues in the workplace

In relation to actual workplace learning:

- In preparation for workplace learning
- As a partial substitute for workplace learning
- As a full substitute for workplace learning
- As a form of reinforcement after workplace learning

How might you design an e-simulation?

In reflecting on the following design characteristics of activities described by Hedberg, and based on a 'wide literature review of recent research and theory', Reeves, Herrington, & Oliver (2002), and later Herrington, Oliver, & Reeves (2003) identify and define **ten broad design characteristics** of authentic activities. These are listed below and can be used to benchmark the design of an e-simulation (by this we mean they can be used both to inform the design of an e-simulation and as basis for reviewing a completed resource):

ACTIVITY

You might wish to undertake this activity if:

- You've had previous experiences of either paper-based or e-simulations
- You are considering the design of an e-simulation
- You have completed the development of an e-simulation

Make notes on how you see your simulation as benchmarked against these 10 design characteristics.

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| 1. | <i>Authentic activities have real world relevance:</i> Activities match as nearly as possible the real world tasks of professionals in practice rather than decontextualised or classroom based tasks. |
| <i>Design Characteristics of e-sim:</i> | |
| 2. | <i>Authentic activities are ill-defined, requiring students to define the tasks and sub-tasks needed to complete the activity:</i> Problems inherent in the activities are ill-defined and open to multiple interpretations rather than easily solved by the application of existing algorithms. Learners must identify their own unique tasks and sub-tasks in order to complete the major task. |
| <i>Design Characteristics of e-sim:</i> | |
| 3. | <i>Authentic activities comprise complex tasks to be investigated by students over a sustained period of time:</i> Activities are completed in days, weeks and months rather than minutes or hours. They require significant investment of time and intellectual resources. |
| <i>Design Characteristics of e-sim:</i> | |
| 4. | <i>Authentic activities provide the opportunity for students to examine the task from different perspectives, using a variety of resources:</i> The task affords learners the opportunity to examine the problem from a variety of theoretical and practical perspectives, rather than allowing a single |

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| perspective that learners must imitate to be successful. The use of a variety of resources rather than a limited number of pre-selected references requires students to detect relevant from irrelevant information. | |
| <i>Design Characteristics of e-sim:</i> | |
| 5. Authentic activities provide the opportunity to collaborate: Collaboration is integral to the task, both within the course and the real world, rather than achievable by an individual learner. | |
| <i>Design Characteristics of e-sim:</i> | |
| 6. Authentic activities provide the opportunity to reflect: Activities need to enable learners to make choices and reflect on their learning both individually and socially. | |
| <i>Design Characteristics of e-sim:</i> | |
| 7. Authentic activities can be integrated and applied across different subject areas and lead beyond domain specific outcomes: Activities encourage interdisciplinary perspectives and enable students to play diverse roles thus building robust expertise rather than knowledge limited to a single well-defined field or domain. | |
| <i>Design Characteristics of e-sim:</i> | |
| 8. Authentic activities are seamlessly integrated with assessment: Assessment of activities is seamlessly integrated with the major task in a manner that reflects real world assessment, rather than separate artificial assessment removed from the nature of the task. | |
| <i>Design Characteristics of e-sim:</i> | |
| 9. Authentic activities create polished products valuable in their own right rather than as preparation for something else: Activities culminate in the creation of a whole product rather than an exercise or sub-step in preparation for something else. | |
| <i>Design Characteristics of e-sim:</i> | |
| 10. Authentic activities allow competing solutions and diversity of outcome: Activities allow a range and diversity of outcomes open to multiple solutions of an original nature, rather than a single correct response obtained by the application of rules and procedures. | |
| <i>Design Characteristics of e-sim:</i> | |

This exercise has been completed for an e-simulation developed in journalism at Deakin called HOTCopy:

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| 1. Authentic activities have real world relevance: Activities match as nearly as possible the real world tasks of professionals in practice rather than decontextualised or classroom based tasks. | |
| <i>Design Characteristics of HOTcopy:</i> | The real-world relevance of HOTcopy, as described earlier, has been confirmed by journalism professionals, the newspaper industry and tertiary |

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| | educators. |
| <p>2. <i>Authentic activities are ill-defined, requiring students to define the tasks and sub-tasks needed to complete the activity:</i> Problems inherent in the activities are ill-defined and open to multiple interpretations rather than easily solved by the application of existing algorithms. Learners must identify their own unique tasks and sub-tasks in order to complete the major task.</p> | |
| <p><i>Design Characteristics of HOTcopy:</i></p> | <p>Journalistic tasks in HOTcopy are set and emerge as running stories. Ambiguous and conflicting information is optionally available from multiple sources. To the best of their ability in the time, students will resolve the ethical, legal, news-worthiness and other measures of story quality to create finished 'copy'. Multiple interpretations are initiated but not closed during the scenario debriefing.</p> |
| <p>3. <i>Authentic activities comprise complex tasks to be investigated by students over a sustained period of time:</i> Activities are completed in days, weeks and months rather than minutes or hours. They require significant investment of time and intellectual resources.</p> | |
| <p><i>Design Characteristics of HOTcopy:</i></p> | <p>HOTcopy scenarios are real time-limited experiences of about thirty minutes. Thus far however, these experiences are also 'prepared for' during classes and debriefing also occurs outside the virtual experience. Teaching staff also expect some scenarios to provide practice/preparation for exams, internships and growth through the scenarios during their program of study.</p> |
| <p>4. <i>Authentic activities provide the opportunity for students to examine the task from different perspectives, using a variety of resources:</i> The task affords learners the opportunity to examine the problem from a variety of theoretical and practical perspectives, rather than allowing a single perspective that learners must imitate to be successful. The use of a variety of resources rather than a limited number of pre-selected references requires students to detect relevant from irrelevant information.</p> | |
| <p><i>Design Characteristics of HOTcopy:</i></p> | <p>Professional judgment is a key learning goal and scenarios provide multiple media sources used in news-writing. Scenarios may be completed several times with varying, yet legitimate outcomes. The various embedded dilemmas provide the basis for value judgments and interpretations that may be defended. HOTcopy should be integrated in a blended learning model involving articulation with other strategies such as tutorials and work-placements.</p> |
| <p>5. <i>Authentic activities provide the opportunity to collaborate:</i> Collaboration is integral to the task, both within the course and the real world, rather than achievable by an individual learner.</p> | |
| <p><i>Design Characteristics of HOTcopy:</i></p> | <p>The community of peers and experts provide the network of practice, theory, and factual sources to problematise and discuss the scenario experiences.</p> |

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| | HOTcopy was conceived as a core curriculum resource for the Journalism program as part of the e-journalism project concurrent with the introduction of an LMS at Deakin. |
| 6. <i>Authentic activities provide the opportunity to reflect:</i> Activities need to enable learners to make choices and reflect on their learning both individually and socially. | |
| <i>Design Characteristics of HOTcopy:</i> | Intermittently during the scenarios, students encounter interactive 'decision events' and after filing their 'copy', more comprehensive reflective questions ask students to stand back and critique decisions taken under pressure of time, before retiring to the 'pub' for the initial debriefing by virtual 'colleagues' who provide sometimes inconclusive, conflicting but usually defensible advice. |
| 7. <i>Authentic activities can be integrated and applied across different subject areas and lead beyond domain specific outcomes:</i> Activities encourage interdisciplinary perspectives and enable students to play diverse roles thus building robust expertise rather than knowledge limited to a single well-defined field or domain. | |
| <i>Design Characteristics of HOTcopy:</i> | he collaborative planning of scenarios by, for example, staff offering programs in public relations, law, media studies, has been advocated. The conceptual and technical basis of HOTscenario authoring facilitates this. Public Relations and Journalism have already created video resources in such a collaborative manner. |
| 8. <i>Authentic activities are seamlessly integrated with assessment:</i> Assessment of activities is seamlessly integrated with the major task in a manner that reflects real world assessment, rather than separate artificial assessment removed from the nature of the task. | |
| <i>Design Characteristics of HOTcopy:</i> | Assessment was one key driver of the HOTcopy design. Evaluations have confirmed student interest and encouragement that HOTcopy be used in supervised laboratory sessions to create authentic 'work' in place of traditional exams. In semester 2, 2003 HOTcopy will be used for assessment purposes. A secure output file (containing the text compiled from up to 5 text fields representing different stories and note-taking) is being investigated for implementation. |
| 9. <i>Authentic activities create polished products valuable in their own right rather than as preparation for something else:</i> Activities culminate in the creation of a whole product rather than an exercise or sub-step in preparation for something else. | |
| <i>Design Characteristics of HOTcopy:</i> | The real news stories and other 'works' completed in HOTcopy are suitable for submission to staff for feedback, assessment or a professional portfolio. Rather than being viewed as only a 'set task' they may be 'works' completed under a virtual internship |

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| | representing evidence of the integrated capabilities of a graduate. |
| 10. Authentic activities allow competing solutions and diversity of outcome: Activities allow a range and diversity of outcomes open to multiple solutions of an original nature, rather than a single correct response obtained by the application of rules and procedures. | |
| <i>Design Characteristics of HOTcopy:</i> | This criterion is best exemplified by work completed by students with different capabilities, discipline/curriculum knowledge, values and emotional temperaments. This is confirmed by the 'pub' debriefing. Such work-place realities are balanced by HOTcopy's goal of improving the legal and ethical professional qualities of graduates. |

Oliver (2001) reports on the Flexible Learning Toolbox Project for the VET sector by the Australian National Training Authority (ANTA). A fundamental requirement of Toolbox resources is the need to exhibit effective teaching and learning approaches. To support this requirement, proponents need to demonstrate their capacity to develop resources with certain features. These features are listed below using the Deakin HOTcopy e-simulation as an exemplar:

| Toolbox learning designs | HOTcopy learning designs |
|---|--|
| <ul style="list-style-type: none"> a firm basis in an educational model which recognises an active, constructive role for learners; | <i>HOTcopy</i> is a catalyst for active, reflective professional practice with scaffolding from experts. Constructivistic foundations of HOTcopy's design is consistent with Cognitive Apprenticeship Theory, Engagement Theory, and Cognitive Flexibility Theory. The designed ambiguities and emerging work tasks and resources are also consistent with Problem-Based Learning. |
| <ul style="list-style-type: none"> learning activities which engage the learner in active processing of the subject matter rather than mere knowledge acquisition; | <i>HOTcopy</i> provides real world journalistic tasks in the face of both clear and ambiguous subject matter relevant to the identified curriculum. Students 'are encouraged and have reason to act in a self-directed fashion' (Oliver 2001 p.210) They actively create solutions to professional problems, preparing stories to real deadlines. |
| <ul style="list-style-type: none"> learning settings and tasks that encourage meaningful online communication and interaction (between learners as well as | <i>HOTcopy</i> is used by tutorial groups that engage in group debriefings after the individual experiences of the simulated work environment. Students studying at a distance may engage in online conferencing with other students regardless of location. |

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| between teachers and learners) | |
| <ul style="list-style-type: none"> • content resources which are visually attractive, motivating to use and organised logically for ease of navigation; | <i>HOTcopy</i> presents a meaningful and practical interface combining functionality, representations, metaphors and simulations that usability testing and student evaluations have confirmed meet requirements. |
| <ul style="list-style-type: none"> • representations of authentic and real life settings in preference to textual descriptions. | <i>HOTcopy</i> has been validated by the journalism profession and newspaper industry as representing the key authentic real-life settings within the scope of the simulation goals. |

ACTIVITY

You might wish to take your simulation and benchmark it against the features identified in the Flexible Learning Toolbox Project.

What are the technical implications?

In terms of design using digital media technologies, the e-simulations use state-of-the-art tools and media formats.

For example, the *HOTcopy* e-simulation developed for journalism at Deakin:

- Presents scenarios as interactive movie compositions containing multiple re-usable media elements (in formats: video, audio, photographs, graphics, text etc.).
- The scenarios are presented in an interface containing office resources, guidance and up to five editable text fields.
- Authored with the aid of a FileMaker™ database containing the media resources and events, scenarios may be adjusted for different educational purposes.
- Use various technologies (e.g. XML, Macromedia Director™, Apple® QuickTime™ and LiveStage™ and various AV post-production tools) to provide a flexible model for preparing scenarios delivered (optionally) on CD. When launched by users *HOTcopy* automatically checks for an internet connection linking to the website www.HOTcopy.info from which certain additional flexibilities may be provided.
- A list of derivative scenarios may be automatically drawn from the website, but *HOTcopy* also advises if it has not detected an internet connection.

Re-use is central to the design of e-simulations. For example, the design of Deakin *HOTcopy* e-simulation has been based on media elements that are re-usable in the unfolding suite of scenarios across the whole curriculum of the Journalism program. Further, the underlying model was graphically demonstrated to be both simple and flexible. The simulation values in

HOTcopy are not achieved through complex interdependencies between user-driven events. In addition, the 'shell' of HOTcopy provides a range of functions that are used as needed. Not all functions are used in each scenario, but most of these scenarios have categories of events in common, and share media elements for those events. The cost-efficiencies of this become more apparent as more scenarios are created.

From the outset, designers' plans for HOTcopy included revising scenarios through a web interface to a database. Development of this function is in its infancy, but the revision of scenarios has been demonstrated via a prototype database for scenario creation, and web-connectivity from the published CD to www.hotcopy.info site, for downloading the xml files that provide directions to QuickTime. While HOTcopy implements a model based Director, LiveStage, QuickTime, XML and defined 'regions' associated with 'movie-in-a-movie', the technologies have evolved rapidly and our approach to creating simulations in a generic framework like HOTcopy, is not constrained.

How can they be developed and evaluated?

E-simulations have normally progress through enquiry-based design and development activities such as:

- needs assessment and analysis,
- proof of concept,
- prototyping,
- interface design and usability testing,
- field trials,
- and formative and summative evaluations (both informal and formal).

User and other critique on developing e-simulations can be sourced from:

- discipline and other students (other courses),
- teaching staff,
- education design and technology specialists,
- external experts from the industry/profession, and
- other higher education institutions.

Using cycles of a rapid prototyping and development for iterative design through testing and evaluation means that user groups can be exceptionally varied. The strategy for gaining critique and evaluation from various stakeholders can result in: Student Evaluations, Teacher Evaluations, Design Expert Evaluations, Media Expert Evaluations, and External Critique and validation from industry and other professional stakeholders.

Contemporary university pressures placed on time and other resources have meant that new approaches are being developed that involve using computer tools to facilitate the authoring of simulation scenarios. It is also becoming possible to edit and otherwise revise the scripts for simulations in a run-time

(no-media) mode, where the simulation logic and behaviours can be tested before the multiple media are created.

An example of a strategy of critique and evaluation in action: HOTCopy e-sim development in journalism at Deakin University

The following evaluations were undertaken with HOTCopy during its development:

Student Evaluations: Observation, focus-group discussion and online survey conducted during laboratory-based tutorials resulted in an evaluation report being circulated to teaching staff, the project team and sponsors. Recurrent usability testing of interface design, functions etc by 15 –20 individuals ranging in ages from 18-50 of both sexes and varying degrees of computer competence and knowledge of journalism. Formal evaluation by 83 students reported its value for ‘engaging attention’, ‘prompting action’ and ‘experiencing pressures’. Most felt the pressure in HOTcopy was ‘more serious, urgent and more real than anything experienced in class’.

Teacher Evaluations: Teaching staff used HOTcopy in observation, laboratory tests as a group and also individually. A new member of staff (UK BBC news stringer) was enthusiastic and pressed to use it immediately in his teaching.

Design Expert Evaluations: Associate Dean–teaching & learning (first year initiative); Instructional Designer from Deakin Prime; Educational Designer/Developers Teaching & Learning–faculties: Education, Arts, Business and Law.

External Critique and validation from industry and other stakeholders:

Interactive Media Expert Evaluations: e.g. Information Technology Educator Powerhouse Museum.

Industry: Victorian country newspaper editors: Geelong Advertiser, Bendigo Advertiser, Sunraysia Publishing Mildura, Shepparton News, Evaluation by Geelong Advertiser cadets using paper-based version of survey.

External Profession: members of the Journalism Education Association (e.g. Assoc.Prof Journalism Uni.Wst Syd.)

Stakeholders concerned with students’ experiences of learning: Pres. Stud Assoc preparing report: ‘Good Practices in Undergraduate Learning.’; Snr Distance Education Adviser, Div of Student Life, Advocate for off-campus students.

Equal Opportunity: HOTcopy has also been evaluated by Deakin’s Disability Resources Centre and the Royal Victorian Institute for the Blind in relation to its audio, vision and text frameworks being amenable to accessibility features. This resulted in the current accessibility project funded by the Higher Education Equity Program that will enhance our response to policies on ‘Equal Educational Opportunity’.

Publisher: Allen & Unwin evaluated HOTcopy version 2, receiving reviews from five experienced journalism lecturers from different Australian

universities. Feedback was positive, though a number of changes were suggested and many of these have been incorporated into the final version.

What are the research and publication opportunities?

Research and publication is taking place around recent e-simulations developed at Deakin. More generally, e-simulations and gaming is a world-wide major development for education and training. It is seen as high potential area for adoption and development in the e-learning in higher education. Simulations, games, role plays etc receive substantial coverage in, to take two significant examples:

- Australasian Society for Computers in Learning in Tertiary Education (ASCILITE) Conferences and accompanying journal
- Ed-Media World Conferences on Educational Multimedia, Hypermedia & Telecommunications and related journals...

along with dedicated Simulation and Gaming Associations like the International Simulation and Gaming Association (ISAGA) and the journal of Simulation & Gaming An Interdisciplinary Journal of Theory, Practice and Research.

In summing up

- E-simulations can represent the effective realisation of a design task in higher education, featuring an authentic learning environment, grounded in a profession and addressing a program-wide curriculum.
- With further technical developments, this type of 'local' curriculum, resource development could prove valuable for larger-scale application involving simulations across multiple professions.
- The educational model underpinning e-simulations, benchmarks as a *congruent response* to the education design advice in contemporary literature about achieving authentic learner active engagement, on the one hand, and the educational technology literature about creating generic frameworks and functions for implementing re-usable digital media elements.

Funding for support of e-simulation developments at Deakin

Three major funding sources are:

- Faculty-based Strategic Teaching and Learning Grant Scheme (STALGS) Program
- Faculty courseware design and development bid for core resourcing via Knowledge Media Division and Institute of Teaching and Learning
- External funding bids, for example, through Carrick Institute of Learning and Teaching in Higher Education Grants Scheme

Resources

Contacts:

- Stephen Segrave, Institute of Teaching and Learning
- Deborah Penrose, Client Services Manager, Science and Technology, and Health, Medicine, Nursing and Behavioural Sciences, Knowledge Media Division
- Catherine Devlin, Client Services Manager, Arts and Education, Knowledge Media Division
- Ian Ferguson, Client Services Manager, Business and Law, Knowledge Media Division

Links to funding sources

Carrick Institute of Learning and Teaching in Higher Education Grants Scheme: <http://www.carrickinstitute.edu.au/carrick/go/pid/16>
Strategic Teaching and Learning Grant Scheme (STALGS) Program, see: <http://www.deakin.edu.au/itl/grants/stalgs.php>

Deakin cases

View each of the cases below and consider ways of making use of simulation technology in your discipline area.

1. **Journalism:** Hotcopy: Two resources help to explain this development as an example of an e-supported authentic teaching/learning experience, namely: Stephen Segrave, 'Hotcopy: simulations for learning professional journalism which first appeared in *Training and Development in Australia*, vol. 3, issue 3, June 2003, pp.6-10 <http://www.deakin.edu.au/itl/pd/tl-modules/assessment/documents/hotcopyjournal2.pdf> and; Contemporary online teaching case, Stephen Segrave, Institute of Teaching and Learning, 'Universal design for accessibility in e-simulations in journalism and beyond': <http://www.deakin.edu.au/itl/teach-learn/cases/files/participants/segrave.htm>
2. **Nursing:** Contemporary online teaching case, Julian Pearce, Faculty of Health, Medicine, Nursing and Behavioural Sciences, 'Problem-based learning in nursing': <http://www.deakin.edu.au/itl/teach-learn/cases/files/participants/pearce.htm>
3. **Public Relations** Wallaby Forest: Contemporary online teaching case, Kristin Demetrious, Faculty of Arts, Using role play as an approach to online assessment: <http://www.deakin.edu.au/itl/teach-learn/cases/files/participants/demetrious.htm>
4. **Psychology** Mods and Rockers e-simulation, Boris Crassini, Faculty of Health, Medicine, Nursing and Behavioural Sciences, ITL Teaching and Learning Recorded Seminars 2006: <http://www.deakin.edu.au/itl/workshops/past-presentations.php>

5. **Law:** Client view e-simulation: Julie Cassidy, Faculty of Business and Law, ITL Teaching and Learning Recorded Seminar 2006:
<http://www.deakin.edu.au/itl/workshops/past-presentations.php>
6. **Criminology:** Forensic Interviewing of a Child, Martine Powell, Faculty of Health, Medicine, Nursing and Behavioural Sciences
7. **Information Systems** First Australian Bank ATM project: Jacob Cybulski, Faculty of Business and Law, ITL Teaching and Learning Recorded Seminars 2006:
<http://www.deakin.edu.au/itl/workshops/past-presentations.php>
8. **Architecture and Construction Management:** Jeremy Ham, Faculty of Science and Technology, ITL Teaching and Learning Recorded Seminar 2006, 'On evolving an IT-enhanced authentic curriculum':
<http://www.deakin.edu.au/itl/workshops/past-presentations.php>
9. **Architecture and Construction Management:** Richard Tucker, Faculty of Science and Technology, ITL Teaching and Learning Recorded Seminar 2006, 'Teaching Group Design Problems - some tips from practice and research':
<http://www.deakin.edu.au/itl/workshops/past-presentations.php>
10. **Politics:** Contemporary online teaching case, Peter Haeusler, Faculty of Arts, 'An online approach to project-based assessment in politics':
<http://www.deakin.edu.au/itl/teach-learn/cases/files/participants/haeusler.htm>
11. **Business and management:** Contemporary online teaching case, John McWilliams, Deakin Business School, Faculty of Business and Law, 'Simulating roles in real world organisations':
<http://www.deakin.edu.au/itl/teach-learn/cases/files/participants/mcwilliams.htm>

Selected general journals

Australasian Journal of Educational Technology:

<http://www.ascilite.org.au/journal.html> (accessed 2nd December 2005)

British Journal of Educational Technology:

<http://www.ingentaconnect.com/content/bpl/bjet;jsessionid=26i70wrpnmvw7.victoria>
(accessed 21st July 2006)

Distance Education: <http://www.odlaa.org/publications/publications.html> (accessed 2nd December 2005)

Higher Education Research and Development Society of Australasia Inc:

<http://www.herdsa.org.au/journal.php> (accessed 2nd December 2005)

International Journal of Web-Based Learning and Teaching Technologies:

<http://www.irma-international.org/journals/index.asp> (accessed 2nd December 2005)

International Journal on E-Learning (IJEL): <http://www.aace.org/pubs/ijel/default.htm>

(accessed 2nd December 2005)

International Journal of Education and Development using ICT:
<http://ijedict.dec.uwi.edu/index.php> (accessed 24 January 2006)

Journal of Distance Education: <http://cade.athabascau.ca/> (2nd December 2005)

Journal of Educational Multimedia and Hypermedia (JEMH):
<http://www.ace.org/pubs/jemh/default.htm> (accessed 2nd December 2005)

Journal of Learning Design (Designing for Effective Learning):
<http://www.jld.qut.edu.au/> (accessed 2nd December 2005)

Journal of Technology and Teacher Education:
<http://www.ace.org/pubs/jtate/default.htm> (accessed 2nd December 2005)

Simulation & Gaming An Interdisciplinary Journal of Theory, Practice and Research,
SAGE Publications: <http://www.unice.fr/sg/> (accessed 30th August 2006)

The American Journal of Distance Education: <http://www.ajde.com/index.htm>
(accessed 2nd December 2005)

Selected conferences

AusWeb (Annual): <http://ausweb.scu.edu.au/aw06/archive/index.html> (accessed 2nd December 2005)

Australasian Society for Computers in Learning in Tertiary Education:
<http://www.ascilite.org.au/conferences.html> (Refereed, held annually)

ED-MEDIA World Conference on Educational Multimedia, Hypermedia and
Telecommunications, Association for the Advancement of Computing in Education
(Refereed, held annually): <http://www.ace.org/conf/edmedia/> (accessed 2nd December 2005)

EDUCAUSE (Annual):
<http://www.educause.edu/EDUCAUSEAnnualConference/1352> (accessed 2nd December 2005)

EDUCAUSE Australasia: <http://www.educause2005.auckland.ac.nz/> (accessed 2nd December 2005)

Higher Education Research and Development Society of Australasia Inc (Refereed,
Annual): <http://www.herdsa.org.au/conferences.php> (accessed 2nd December 2005)

International Simulation and Gaming Association (ISAGA) (Annual):
<http://www.isaga.info/events.htm> (accessed 2nd December 2005)

The Open and Distance Learning Association of Australia: <http://www.odlaa.org>
(accessed 2nd December 2005)

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