Conceptualising learning design as both an analytical and creative process

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Outline

Technology-based innovation should come from teachers

To innovate, teachers need tools for design and planning

→ Tools and representations for a learning design support environment
Teachers as researchers...

• We need to understand how to foster collaborative learning among teachers as learners about e-learning.
• Teachers need to be more like researchers, researching on the teaching of their subject – discovering how best to do it.
• But teachers lack the means and tools to build on others’ work, re-design, experiment, share, reflect, and collaborate.
A different model of teaching

- building on the work of others – reusing, adapting, customising
- with support staff, and tools, to design new pedagogies
- treating teaching as an opportunity to innovate and discover
- collaborating and sharing ideas to improve quality and scale
Tools and representations for a learning design support environment
A Learning Design Support Environment - cross-institutional, interdisciplinary research project

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A Learning Design Support Environment - LDSE project aims

- Research the **optimal model** for an effective learning design support environment (LDSE)

- Achieve an **impact** of the LDSE on teachers' practice in designing technology enhanced learning (TEL)

- Identify the factors that are conducive to **collaboration** among teachers in designing TEL

- **Embed knowledge** of teaching and learning in the learning design software architecture

- **Improve representations** of the theory and practice of learning design with TEL.
User requirements elicited

- **Planning** –
  
  ensure all the components of learning design (aims, learners’ needs, learning activities, intended outcomes, etc) are addressed and are compatible with each other, at different levels of course, module, session, learning activity.

  inspect and edit the explicit model of internal relations (e.g. allocation of staff time for each teaching method used; the cognitive activities that a teaching method facilitates); compare the effects of different learning designs on staff and student workload.

  build a community of practice, where lecturers can discuss and share learning designs, learn from each other, and build on each others’ ideas.

  for allocating lecturers’ time, learners’ time, estimating comparative costs, publishing schedules for modules or sessions, producing module-level planning for administrative purposes.

- **Decision-making** –
  
  help lecturers make decisions by feeding back the implications of a decision for other parts of the process, enabling editing and customising, and representing the resulting design in a link each decision to relevant online advice on learning design, online learning object repositories (e.g. OCW, OpenLearn, MERLOT), case studies (e.g. JISC, ALTC), learning designs (ALTC, iCampus), distillations of educational research findings (e.g. JISC briefings, journal abstracts), local information about learner needs (e.g. feedback surveys, examiners’ reports).

- **Progressive innovation** –
  
  (San Diego et al, 2008)
Approaches to learning design

- Content-based
  constrained by academic interests, discipline aims, qualification (knowledge and skills, duration), professional requirements - tool provides IAG on qualification requirements, QAA learning outcomes for the discipline. links to topic-related resources

- Resource-based
  constrained by resources (facilities, number of staff, income), number of students, entry requirements, student capabilities, contact requirements - tool provides information on resources available, requirements, staff costs, fee levels, other costs, students, course requirements

- Strategic
  determined by institutional curriculum and other T&L-related policies, market demands, learner needs - tool provides links to institutional information

- Pedagogic
  driven by an account of how a student will be enabled to learn and achieve the learning outcome - tool provides advice and guidance on what it takes to learn different types of outcome, links to exemplars of learning activities related to each, student evaluations, information on typical forms of misconception related to topic constrained by learning theories (ID, Soc-constr, Constructionism, Ed tech, etc.) governing teaching strategies - tool provides information, advice and guidance, on teaching strategies, and learning activities, as well as exemplars
Modelling the planning: course, module, session, activity

Aim\textsubscript{n,1} Aim\textsubscript{n,2} ...

Aims

Pre-requisites

Duration

Topics

Teaching methods

Learning outcomes

Assessment methods

Topic\textsubscript{n,1} Topic\textsubscript{n,2} ...

LO\textsubscript{n,1} LO\textsubscript{n,2} ...

Principle 1: Components of a learning design must align at each level: e.g. Topics and Learning Outcomes match Aims
Session

Activity

Module

Course

Programme

‘Layers’ for learning design
Modelling the planning: course, module, session, activity

Principle 1a: Decisions about each component, at each level, should propagate through the network

Aims → Topics → Learning outcomes → Teaching methods → Assessment methods

Pre-requisites → Aims → Duration

LO_{n,1} LO_{n,2} ...

[Diagram with arrows connecting Aims, Topics, Learning outcomes, Teaching methods, and Assessment methods. Arrows also connect Pre-requisites to Aims and Duration to Learning outcomes.]
Modelling the planning: course, module, session, activity

- To identify ways in which the concept of lifelong learning is discussed in policy documents without reference to the potential uses of learning technologies
- To appraise and critique policy implications of ICT for policies, and for different contexts of lifelong learning.

“Multiple mappings are important – really nice and visual”
“... it does make you think”
“This is good reflective/thinking tool – I particularly like its visual aspects of seeing the learning outcomes as a whole”

Principle 11: Users should be able to govern the level of complexity of representation they deal with
Modelling pedagogy against use of time

<table>
<thead>
<tr>
<th>TIME/ACTIVITIES</th>
<th>Attention</th>
<th>Discussion</th>
<th>Production</th>
<th>Inquiry</th>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>30</td>
<td>300</td>
<td>60</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Tutorials</td>
<td>300</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Set readings</td>
<td>27</td>
<td></td>
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<tr>
<td>T-M Assignments</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Online tutorials</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Change distribution of learners’ time across methods?

Change size of learner groups?

Change proportion of cognitive activities defined for a method?

Properties of the course, module, session:
Credit hours, number of students and teachers, aims, outcomes, assessments, etc.

About “E-mod 2”!
The first edition of E-moderating was published in May 2000. The 2nd edition of E-moderating, published in January 2004, offers something of a renewed and refreshed, rather than changed vision, of the role and training of the online teacher or trainer, the person I call the e-moderator. There is a little more about his or her role in synchronous technologies. There is a new chapter about the future e-moderating, which I hope will help you better prepare for what’s around the corner. I’ve updated the stories, views, experiences and online reflections of developing e-moderators and I hope their voices continue to shine through.

Three key themes have emerged since I wrote for the 1st edition of ‘E-mod’ around the turn of the Millennium. First there’s less reason to convince the world that we need support for online teachers, trainers and facilitators, (i.e. from a happy and successful band of e-moderators) to make e-learning work well. Thinking has moved on a little from believing technology may do away with teachers and towards how they can be trained and supported to work online. Second, researchers have stopped counting online messages, making spurious conclusions between online and face to face and started instead to explore when and what we need to make online really worthwhile. I have included some of their published literature for this edition. Third, and as yet largely unresolved, are ways of scaling up the e-moderating task force beyond the early adopters, without consuming huge amounts of diminishing resources. I hope you will find this edition helpful for these new directions. Good luck and report back please! The challenge will last a while, I hope E-mod 2, will help make the online world a more social, supportive and dynamic place.

Gilly Salmon
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Learning is relational - depends on others and on artefacts (Nersessian).

Teacher can model different selections of teaching methods and check effect on learning experience and staff time.

Modelling pedagogy against use of time

<table>
<thead>
<tr>
<th>Teaching method</th>
<th>TIME</th>
<th>Attention</th>
<th>Inquiry</th>
<th>Discussion</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>80</td>
<td>30</td>
<td>??</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Tutorials</td>
<td>30</td>
<td>3</td>
<td>3</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>Set readings</td>
<td>80</td>
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<td>15</td>
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Change distribution of learners’ time across methods?

Change proportion of cognitive activities defined for a method?
Support for modelling learning experiences

• The teacher can model the effect on the learning experience of different selections of teaching methods
• Can explore other conventional and digital methods

“It encourages thinking outside current teaching box and therefore use of other methods”
“This is more useful than I expected it to be”
“...very good for integrating learning technologies and the learning design process”
“...as a newcomer to writing modules I welcome the help and appreciate definitions/suggestions”

Principle 12: Users should be able to model the pedagogic benefits and workload costs of different combinations of teaching methods
## Tool for modelling teacher workload

### Comparative models for teacher training

#### Define Number of students
- 50

*Black numbers can be edited; red numbers are derived.*

#### Assign Group size

<table>
<thead>
<tr>
<th>Model</th>
<th>Learner Time</th>
<th>Teacher Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1: Conventional methods</td>
<td>200, 100, 100, 200</td>
<td>400, 1000, 10, 1000</td>
</tr>
<tr>
<td>Model 2: Blended learning</td>
<td>100, 50, 50, 100, 100, 50, 50, 100</td>
<td>200, 500, 5, 500, 10, 15, 2.5, 10</td>
</tr>
<tr>
<td>Model 3: Distance learning</td>
<td>10, 10, 50, 100, 150, 100, 80, 100</td>
<td>20, 100, 5, 500, 15, 30, 4, 10</td>
</tr>
</tbody>
</table>

#### Allocate Learner time

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<td>200, 500, 5, 500, 10, 15, 2.5, 10</td>
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<tr>
<td>Model 3: Distance learning</td>
<td>10, 10, 50, 100, 150, 100, 80, 100</td>
<td>20, 100, 5, 500, 15, 30, 4, 10</td>
</tr>
</tbody>
</table>

#### Assumptions

<table>
<thead>
<tr>
<th></th>
<th>Teacher preparation time / student hour</th>
<th>Teacher presence needed / student hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.0, 0.0, 0.1, 0.0, 0.1, 0.0, 0.1, 0.1</td>
<td>1.0, 1.0, n/a, 0.1, n/a, 0.1, n/a, n/a</td>
</tr>
</tbody>
</table>

#### Principle 12:
Users should be able to model the pedagogic benefits and workload costs of different combinations of teaching methods.

Shift more lecture time to web,
more tutorial to online,
project group to online,
marking to computer
to halve the teaching time
Creative tools for ‘progressive innovation’

Given your analysis of learner needs, please select the learning outcome that is most relevant:

**Principle 13:** Users should be able to link to supporting ideas to match the learning outcomes they want to achieve for learners.
Can teaching ‘build on the work of others’? - Learning outcomes across disciplines (Entwistle, 2005)

Biology: “achieve interconnective and synoptic understanding”
Economics: “bring appropriate concepts and research findings to bear in developing solutions “
History: “understand how evidence is used in argument”

43 similar statements from these + Music, Media studies and Engineering

12 academics from maths, philosophy, cognitive science, computer science, and sociology, classed 19/43 as ‘relevant’ for their subject.

So we can expect lecturers to be grappling with similar kinds of learning outcomes

- so could they share learning designs across disciplines?
Creative tools for ‘progressive innovation’

Given your analysis of learner needs, please select the learning outcome that is most relevant:

### Likely learner needs
- Understanding meaning of terms, special words
- Understanding the processes within a system
- Understanding and applying a complex concept
- Motivation to do thorough research
- Justifications for key principles or relationships
- Seeing the familiar as problematic
- Understanding the value of new concepts

- Provide an animated representation of the system working, which learners can step through, and then report their understanding
- Provide a simulated model of the system and ask learners to manipulate it to achieve a particular outcome, and then explain how it works
- Use a role-play activity to get learners to take turns in teaching and questioning about elements of the system, and collaborate on producing the best explanation
- Develop a set of inappropriate explanations, taken from other learners’ assignments and exams, ask learners to ‘mark’ them alongside expert explanations, and discuss results.
A creative tool for representing learning designs (LAMS) www.lamscommunity.org

“To understand the processes within osmosis through a role-play activity to explain it.”

Link to website explaining osmosis through a simulation

The sequence of learning activities embodies a pedagogic idea - captured to enable the teacher to re-use, review, and improve.
Requirements for ‘progressive innovation’

We need to be able to

• link from the specific context to the relevant generic form
• enable generation of a new specific activity from the generic form
• pedagogical patterns for each level of description

This requires

• categorisation of learning outcomes – as in QAA, Tuning exercises
• categorisation of design patterns and activity sequences in terms of learning outcomes they are designed to achieve
• common standards of metadata to enable resource discovery of this kind
A tool for *migrating* learning designs (LAMS)

www.lamscommunity.org

“The sequence of learning activities embodies a pedagogic idea - captured for others to adopt, adapt, re-use, review, improve, and share.”
Conceptual representation of pedagogic theory at different levels of description