Evaluating The Le@rning Federation’s online curriculum content:
A literacy educator’s perspective

Peter Freebody, University of Queensland, August, 2006
• Literacy and disciplines: modalities and technologies
• field trial of the Le@rning Federation’s online curriculum content - survey and case study data
• ‘new technologies’ as part of ‘old pedagogies’
• the digital bases of ‘new disciplinary and inter-disciplinary knowledge’ and implications for futures-oriented learning and teaching in schools
Heckman: Maintain early gains, otherwise the original educational investments will be dissipated, yielding close-to-zero returns for the system, the society, and the individual:

*Complementarity (synergy) of investment reinforces self-productivity ... early investments must be followed up by later investments to be effective.* (2005: 3-4)

The urgent need to maintain literacy and numeracy development in emerging fields of study that put new ideas and genres to work with new technologies in new learning settings.
For example, the case of the ‘New Life Sciences’

- Neuroscience, biochemistry, genetics, evolutionary biology, biotechnology, bioinformatics, proteomics, genomics, bioethics, cellular and molecular biology
- New connections between these topics / disciplines and mathematics, physics, chemistry and earth and space sciences
- In large part, new knowledge can be produced, disseminated, and effectively taught only via digital technologies, and much is known and represented in symbolic forms other than, or in conjunction with language
We need to understand how narrowly restrictive our literacy education traditions have been in the past in order to see how much more students will need in the future than we are now giving them ... photo images, video clips, sound effects, voice or audio, music, animation, or more specialized representations (mathematical formulas, graphs and tables, etc). (Lemke, 1998: 288)

Language ... is unsurpassed as a tool for the formulation of difference and relationship, for the making of categorical distinctions.

It is much poorer ... for formulating degree, quantity, gradation, continuous change, continuous co-variation, non-integer ratios, varying proportionality, complex topological relations of relative nearness or connectedness, or nonlinear relationships and dynamical emergence. (Lemke, 1998: 87, 92)
The new ‘special-needs’ person in the classroom

- The average age of Australian teachers
- The tenuous place of professional development in the jurisdictions’ agenda
- The ‘plodding immigrant’ syndrome - new knowledge, mediated by new modalities, delivered by new technologies
The TLF review data: Acknowledgements

Overview

• Thanks to state, territories & NZ Liaison Officers, teachers, and students for participating
• to David McRae and Sandy Muspratt for data collection and analysis

• Recap trial findings
  • Main patterns, cautions, speculations
• Survey data
  • Engagement, learning, specific object variations
• Case study data
  • Potentials, dangers, “virtuoso cases”
• Best practice field study
  • Preliminary results
The positive case:

A strong *prima facie* case was established, from direct observation, interview and extensive surveying, that the use of TLF online curriculum content:

- is in general supported enthusiastically by teachers, parent home-tutors and students
- motivates students to attend to and engage with tasks
- enhances students’ learning and interest in learning across a range of tasks
• Teachers need time to ensure that their selection of learning objects, from an increasingly wide range, is appropriate to needs.

• Technical difficulties present ongoing frustrations to teachers and increasingly complex and consequential challenges to systems.
• to test trial pilot findings in light of improved instrumentation and sampling
• to revisit perceptions, practices and recommendations from school colleagues a year on
• to have a better sense of the range of LO-related practice in classrooms
Surveys were web-administered to teachers and students (with paper-copy back-up)

Case study sites were visited, with principals, teachers and students interviewed, and lessons observed.
Distribution of survey responses

- Schools (n = 186)
- Teachers (n = 283)
- Students (n = 2518)

Percentage distribution for different regions:
- ACT
- NSW
- NT
- NZ
- QLD
- SA
- TAS
- VIC
- WA
- Missing
Of the 17 schools
• 11 urban, 3 rural, 3 remote
• 7 primary, 7 secondary, 2 K-12, 1 K-8

Some special features:
• 5 High Indigenous
• 3 Special needs / At-risk
• 2 Girls’ schools
• 1 Distance Education Centre
• continued strongly positive reaction from teachers and students for both learning and engagement.
• patterns apply across all teacher and student demographics.
• Multi-level models show considerable variation within and between LOs, and some related to curriculum area.
• major variations in: i) awareness and usage in schools, and ii) degrees of integration.
• potentially new learning environments being put to ‘old’ pedagogical work
<table>
<thead>
<tr>
<th>General evaluations of students</th>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I did not need a lot of help from my teachers to do the learning object</td>
<td>3.25</td>
<td>3.75</td>
</tr>
<tr>
<td>It helps working with a partner to do the learning object</td>
<td>3.00</td>
<td>3.25</td>
</tr>
<tr>
<td>The learning object helped me think about new ideas</td>
<td>3.37</td>
<td>3.63</td>
</tr>
<tr>
<td>The learning object was easy to work through</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>The learning object was interesting and fun</td>
<td>3.75</td>
<td>3.75</td>
</tr>
</tbody>
</table>
Sound
Colour, pictures, animation, video
Interacting with the learning object
Working at my own pace
Repeating activities until I was successful
Getting feedback which told me if I was right or wrong
Getting information which told me how to do the activity better

How helpful were these features

not at all helpful
helpful
extremely helpful

Features helping students learn from LOs
Motivation to engage in the task
Persistence in doing the task
Enjoyment in doing the task
Ability to collaboration with peers in doing the task
Independence in managing and completing the task

How helpful was this learning object in students in their:

Teachers' perceptions of motivational effects

Not at all  | 2  | 3  | 4  | 5  | 6  | 7  | Extremely

Independence in managing and completing the task
Ability to collaboration with peers in doing the task
Enjoyment in doing the task
Persistence in doing the task
Motivation to engage in the task
Teachers’ perceptions of learning outcomes

How valuable was the learning object in helping students in their:

FACTUAL / CONTENT LEARNING
- Factual content
- Key processes
- Label elements and parts
- Define ideas and processes

CONCEPTUAL / UNDERSTANDING
- Paraphrase key concepts
- Explain ideas and connections
- Compare and contrast
- Evaluate and justify

TRANSFER OF KNOWLEDGE
- Apply ideas and processes
- Demonstrate applications
- Construct new objects / processes

Teachers’ perceptions of learning outcomes:
not at all | 1 2 3 4 5 6 7 extremely
---|---
Teachers’ perceptions of learning outcomes
Clustering teachers on their assessments of learning outcomes

Learning Outcomes

- Factual
- Conceptual
- Transfer of knowledge

Standardised Means

Group 1 (n = 102)
Group 2 (n = 82)
Group 3 (n = 30)
Group 4 (n = 31)
• between responses and the student or teacher demographics we assessed

• that is, differing degrees of like or dislike, and nominations of key features were all distributed “randomly” across the teacher and student samples
Of the 17 schools

- 1 - use of the Learning Objects (LOs) embedded into general, conventional teaching practice
- 5 - substantial use by a small proportion of staff
- 6 - some people using them from time to time
- 5 - in the earliest stages of implementation
I love the way [the LOs] engage kids and help them in the production of their work. They are so powerful in that regard. They are a great tool in our repertoire of engaging kids. … Students are working at their own pace and … being responsible for their own learning. We can use them across the board, and find them especially helpful with our integration students (teacher, primary school)
One of the major issues for the students I work with is finding the right starting point to enable them to learn effectively. In their normal classroom work the entry level can be just too high. Through using the objects I find that we can progress at a much faster rate through the syllabus and the sorts of content we want them to master. (teacher, high school)
• they get feedback straight away which keeps them involved and motivated. (teacher, primary school)

• The independence kids can achieve is phenomenal. Variety, motivation, flexibility, ease of use, the interactivity is very important. (teacher, at-risk centre)

• They re-read — we do notice this — go back and recover. Being able to repeat is very important. It is an additional incentive, which otherwise would not be there and which our kids need, to get things right. (teacher, at-risk centre)
Key features: Summary from a dedicated user

• They encourage a high level of engagement from students because of their interactivity.

• The open-endedness of many of the objects stimulates further independent learning.

• The screen and interface are generally very clear and accessible.

(teacher, primary school)
Pedagogy is “influenced but not determined” by LO use (case study summary notes, McRae)

“We saw the LOs being used in ways ranging from the tightest lock-step process imaginable to unsupported open choice.” (case study summary notes, McRae)
Some of the considerations that guided the thinking of some schools’ staff were: that LOs should be used for a particular educational purpose only and not as a time-filler (“if they were openly accessible they might lose some of their appeal and interest”); only the teacher should be making judgments about their use to optimise learning. We saw cases where all accessible objects were made available for staff as part of the school’s digital resource library and were indexed and delivered in a structured, pre-determined way.” (case study summary notes, McRae)
Field study of good practice

- Years 5 & 7 mathematics

- Topics: Number and probability ("chance")

- Intervention: 6 weeks

- 20 classrooms in each year level

- 10 using Learning Objects (however the teacher determined); 10 doing ‘business-as-usual’
Preliminary results:
Yr 7 ‘chance’ pre-test

Estimated Probability

Number correct

Biz-as-usual
Learning Object
Preliminary results: Yr 7 ‘chance’ post-test

Estimated Probability

- Biz-as-usual
- Learning Object
Preliminary results:
Yr 5 ‘chance’ pre-test

![Graph showing the relationship between number correct and estimated probability for Biz-as-usual and Learning Object.]
Preliminary results:
Yr 5 ‘chance’ post-test

Number correct

Estimated Probability

Biz-as-usual
Learning Object
Preliminary results:
Yr 7 ‘Number’ pre-test & post-test

Pre-test

Post-test
Preliminary results:
Yr 5 ‘Number’ pre-test & post-test

Pre-test

Post-test
The job specs for online support

• Building bridges for border crossings between

  the powerful disciplinary formations that structure the curriculum

  and the repertoire of skills, attitudes, understandings and dispositions that underpin access and purposefulness
The “dual mandate” of disciplinarity: epistemic and pragmatic

(Anderson & Valente 2002, ch 1)

… the epistemic

“On the one hand, the production of knowledge … requires secure principles of determination, from which inferences and rules of evidence may be drawn.”

… the pragmatic

“On the other hand, the initiation and performance of effective social actions … requires a minimal degree of unconditioned agency, without which the changes wrought could not be directed to a designated end.”

Disciplinarity carries a “a sense of practical regimen into an economy of conceptual enterprise”
Educational experiences are dynamic movements of *propositional*, *procedural* and *dispositional* resources, and the portability of these to new sites – cycling between epistemic and pragmatic practices.


Freebody, P. (2006) *Early-stage use of The Le@rning Federation's learning objects in schools. Results of a field review*. MCEETYA, both at [www.thelearningfederation.edu.au/tlf2](http://www.thelearningfederation.edu.au/tlf2)


Images from Google Image.


MacDonald, S.P. (1994). *Professional academic writing in the Humanities and Social Sciences*. Carbondale, Ill.: SIUP.