Connecting the dots: Facilitating quality learning in a Personal Learning Environment through Educational Research

Rita Kop and Hélène Fournier
Institute for Information Technology
Learning and Collaborative Technologies Group

Canadian Institute of Distance Education Research
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What to expect

Changing Learning and Research Environment

Researching a Personal Learning Environment

Surveying super-users

Our Research on MOOCs

Research Challenges

Rethinking Research Ethics

Conclusions
The changing learning environment

'We learn across space as we take ideas and learning resources gained in one location and apply or develop them in another. We learn across time . . . through ideas and strategies gained in earlier years providing a framework for a lifetime of learning. . . managing a range of personal learning projects, rather than following a single curriculum'.

(Sharples et al, 2005, p. 2)
Why a Personal Learning Environment?

1. Liberate access to resources...
2. Liberate the sharing of skills...
3. Liberate the critical and creative resources of people...
4. Liberate the individual... by providing him with the opportunity to draw on the experience of his peers and to entrust himself to the teacher, guide, adviser or healer of his choice

 İllich, 1971, p.103
Connectivism

George Siemens

Stephen Downes
The Web itself is changing

More than 70% of the Digital Universe in 2010 was generated by users – individuals at home, at work, and on the go.

In 2009 the digital universe grew 62%
In 2010 the digital universe grew 50%

http://www.flowtown.com/blog/have-we-reached-a-world-of-infinite-information?display=wide
Connecting the dots: a changing research environment

- Understanding the environment to be researched is key to connecting the dots.
- An open rather than a closed learning environment means adding Big Data to the mix.
Challenges in capturing Big Data
Connecting the digital dots

Our world today is about connecting the digital dots. The challenge is in **dealing with the complexity**—the dots are multidimensional, of varying sizes and colors, **continuously changing**, and **linked to others**, as yet unimagined dots. Nonetheless, to successfully connect the dots at any level in cyberspace means we must be **literate**, both **digitally** and **visually**.

Jones-Kavalier & Flannigan, 2006
# Design-based Research Approach

<table>
<thead>
<tr>
<th>Design Based Research Approach</th>
<th>Design type</th>
<th>Research methods</th>
<th>Development phase</th>
<th>Evaluation phase</th>
<th>Dissemination phase</th>
</tr>
</thead>
</table>
| **Background research**       | • Product design  
• Usage centred design  
• Interface design  
• Learner experience design  
• Instructional design | • Literature review  
• Super-users surveys  
• Close contact with PLE researchers worldwide | • Feed results of literature and surveys into the design | | • Journal articles, book chapters, conference papers |
| **Innovation development**    | • Product design  
• Usage centred design  
• Learner experience design | • Iterative process of design and development  
• Tracking of Intellectual Property | • Creation of PLE architecture  
• Design and development of PLE components  
• Development of data model/flow | • Evaluation of prototype after each iteration  
• Evaluation of IP of prototype | • Commercialization IP and patent development  
• Diffusion and adoption |
| **Usability testing**         | • Product design  
• Usage centred design  
• Interface design | • Feedback on mock-ups of the PLE  
• Testing of the PLE prototype at each stages of development/iteration | • Feed the results of tests into design  
• Start process again at next iteration | • Test final prototype on quality, interface and usability | • Journal articles, book chapters, conference papers |
| **Educational research**      | • Learner experience design  
• Instructional/scaffold design | • Piloting testing and comparisons of learning in 3 case studies (with different users in different scenarios) | • Case studies in MOOCs  
• Workplace-based  
• Multi-media based  
• without and with Plearn | • Evaluation of learner experience  
• Evaluation of instruction/facilitation/scaffolding  
• Theory development | • Journal articles, book chapters, conference papers |
‘Design is the process of evoking meaning’

Researching a Personal Learning Environment

Phase 1 - Research to inform the design and development of Plearn:

- Literature review
- Super-users surveys
- Close contact with PLE researchers worldwide

Phase 2 - Educational research:

- Comparison of learning without and with Plearn in 3 case studies (with different users in different scenarios) Learning on a MOOC

Phase 3: Usability testing of Plearn:

- Feedback on mock-ups of the PLE
- Testing of the PLE prototype at different stages of development
Research Approach

Qualitative methods
Virtual ethnography consisting of:
• Observations on learning environment (eg. MOOC Moodle)
• Observations outside the learning environment using course tag
• Active participation by facilitator
• Action research by participants
• Qualitative questions on three surveys
• Focus group

Quantitative methods:
• Data mining of the learning environment
• Data mining outside the learning environment using course tag
• Surveys
Analysis of data

Qualitative data
• Standard discourse analysis: sorting data into themes
• NVivo

Quantitative data:
• Learner analytics and visualization
• Statistical analysis of surveys

Connecting Qualitative and Quantitative results
Why learning analytics?

- Learning about learning
- Networking data analysis adds dimension to traditional research methods
- Visualizing = clarifying
- Linking data to enhance learning
- Subject on the PLENK course
Ethical considerations

- Informed consent?
- Privacy - Where does participation begin or end on an open online course?
- Invisible data gathering: Can people opt in or do they have to opt out?
- Use of Big Data left by traces of activities that might not be apparent to the learner
### Survey Themes and Top Answers

<table>
<thead>
<tr>
<th>Survey themes</th>
<th>Top Answers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where do you find information about a topic that interests you?</td>
<td>• Google or other search engines</td>
<td>98%</td>
</tr>
<tr>
<td></td>
<td>• The Web</td>
<td>91%</td>
</tr>
<tr>
<td>What helps you to understand and combine information?</td>
<td>• When it is part of an interactive activity</td>
<td>69%</td>
</tr>
<tr>
<td></td>
<td>• When it is presented using graphs and charts</td>
<td>54%</td>
</tr>
<tr>
<td>What helps you to reflect on a topic or learning activity?</td>
<td>• Talking with other people</td>
<td>83%</td>
</tr>
<tr>
<td></td>
<td>• Writing it down</td>
<td>74%</td>
</tr>
<tr>
<td>What are important factors in learning?</td>
<td>• When someone recommends some relevant information</td>
<td>66%</td>
</tr>
<tr>
<td></td>
<td>• Confidence in my ability to learn</td>
<td>50%</td>
</tr>
<tr>
<td>What are the desirable design features in a PLE?</td>
<td>• Easy to navigate</td>
<td>93%</td>
</tr>
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<td></td>
<td>• A variety of tools to choose from</td>
<td>91%</td>
</tr>
<tr>
<td>What are the desirable information search and organization features?</td>
<td>• Helps to find information relevant to me</td>
<td>83%</td>
</tr>
<tr>
<td></td>
<td>• Allows me to ‘mashup’ information from different sources</td>
<td>82%</td>
</tr>
<tr>
<td>Features and issues in designing your own PLE?</td>
<td>• Allows me to use it to learn from others</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td>• Allow me to structure my learning activities (e.g., in folders)</td>
<td>80%</td>
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</tbody>
</table>
PLE Components

Aggregator + Editor

flexibility

combination of tools and technologies

ease of use

capacity

options/ formats

intuitive interface design

mash up capability

Handy

Range

Refine

Variety

Customize

Right for me
Educational research: learning on a MOOC

Phase 2
MOOC poll
Who were the participants?

Participants' age

- Between 18-24 years old
- Between 25-30 years old
- Between 31-36 years old
- Between 37-42 years old
- Between 43-48 years old
- Between 49-54 years old
- Over 55 years old

Participants' residence

Participants' professional background
What did participants do?

PLENK participation rates
Interactions on the PLENK Moodle

The complex network a facilitator's post generated

Relationships between topics in a discussion in week 1
Tweets for a week: Tweets, retweets, replies

Plenkers in Twitter
Twitter PLENK connections to hash-tag networks

#tags related to Twitter posts in the PLENK Daily - six weeks duration
Research themes

- **Learning experience** – following 12 learners throughout the course, exploring 10 sub-themes
- **Learner autonomy** – investigating four sub-themes
- **Information on networks** and information behavior required to negotiate networks
- **Knowledge on networks**: is it created, constructed, transmitted, or connected and part of the network?
- **Creativity**
- **Effectiveness** of the environment for learning
- **Support** required
I’m learning and contributing as I go... I’m getting more and more involved as I go on and as my comfort level increases. PLNs, despite best intentions can be quite cliquey (sp?) and as a newcomer, that can be quite intimidating. Will I get more comfortable sharing and experimenting? You bet!

A participant
Active participation in connectivist learning

- Aggregating
- Remixing
- Repurposing
- Feed forward

(Downes, 2011)
Importance of active participation

Why was active participation perceived to be important?
What did people produce?

- Twitter posts
- Discussion posts
- Blog posts
- Concept maps
- Google map of participants
- Wordles
- Pearltrees networks
- Presentations
- Animations
- S.Network groups
- Second Life area

What did people produce?
Why did people choose to ‘lurk’?

What does lurking mean to you?
Please select all the items that help to explain your lurking behavior in PLENK2010.

PLENK perceptions around ‘lurking’

Contributing factors to lurking behavior
Motivational issues

What motivates you most in using computer based technologies and/or applications? Please select all that apply:
A combination of research and analysis methods is required to capture depth about the data.

Networking data adds a new dimension to traditional research methods.

Analytics are helpful in learning something new about learning.

Ethics implications.

Linking data could be used to enhance learning.
Helene Fournier, Ph.D.
Helene.Fournier@nrc-cnrc.gc.ca

Rita Kop, Ph.D.
Frederika.Kop@nrc-cnrc.gc.ca
References