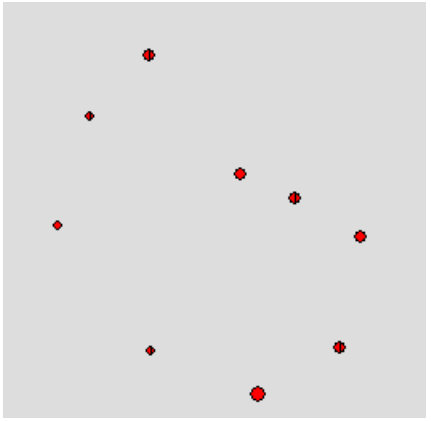
Connecting the dots: Facilitating quality learning in a Personal Learning Environment through Educational Research

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



Canadian Institute of Distance Education Research
Elluminate Presentation 4th May 2011

National Research Council Canada
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Canada

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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

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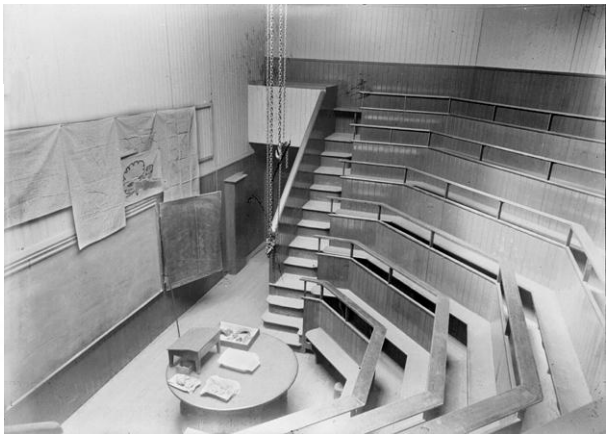
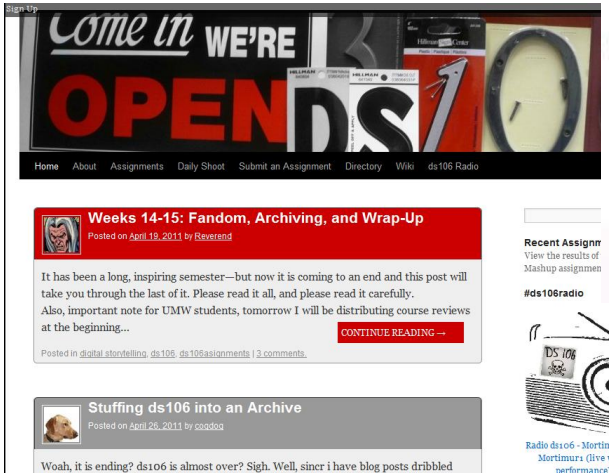
The changing learning environment



http://bit.ly/gmNndn



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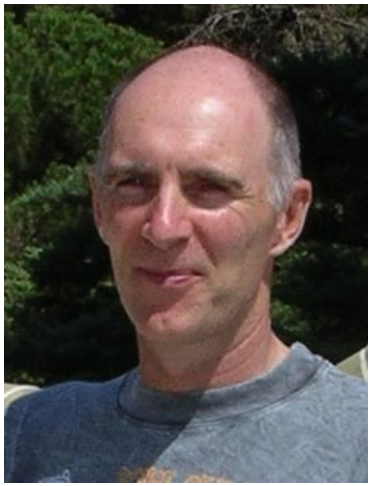
Why a Personal Learning Environment?



'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)

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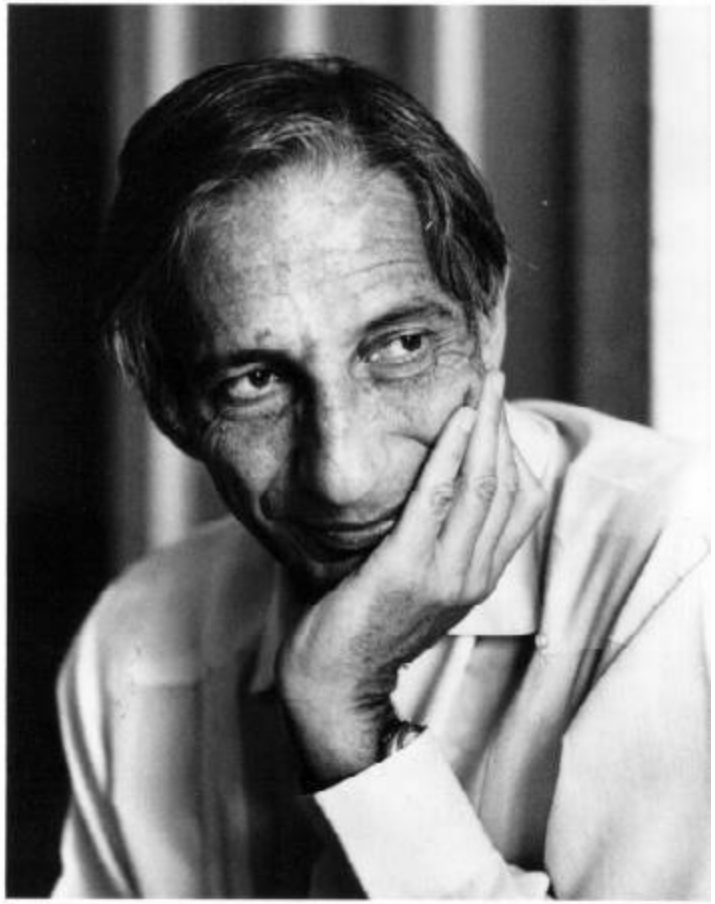
Why a Personal Learning Environment?



'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'

Illich, 1971, p.103

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Connectivism

George Siemens

Stephen Downes

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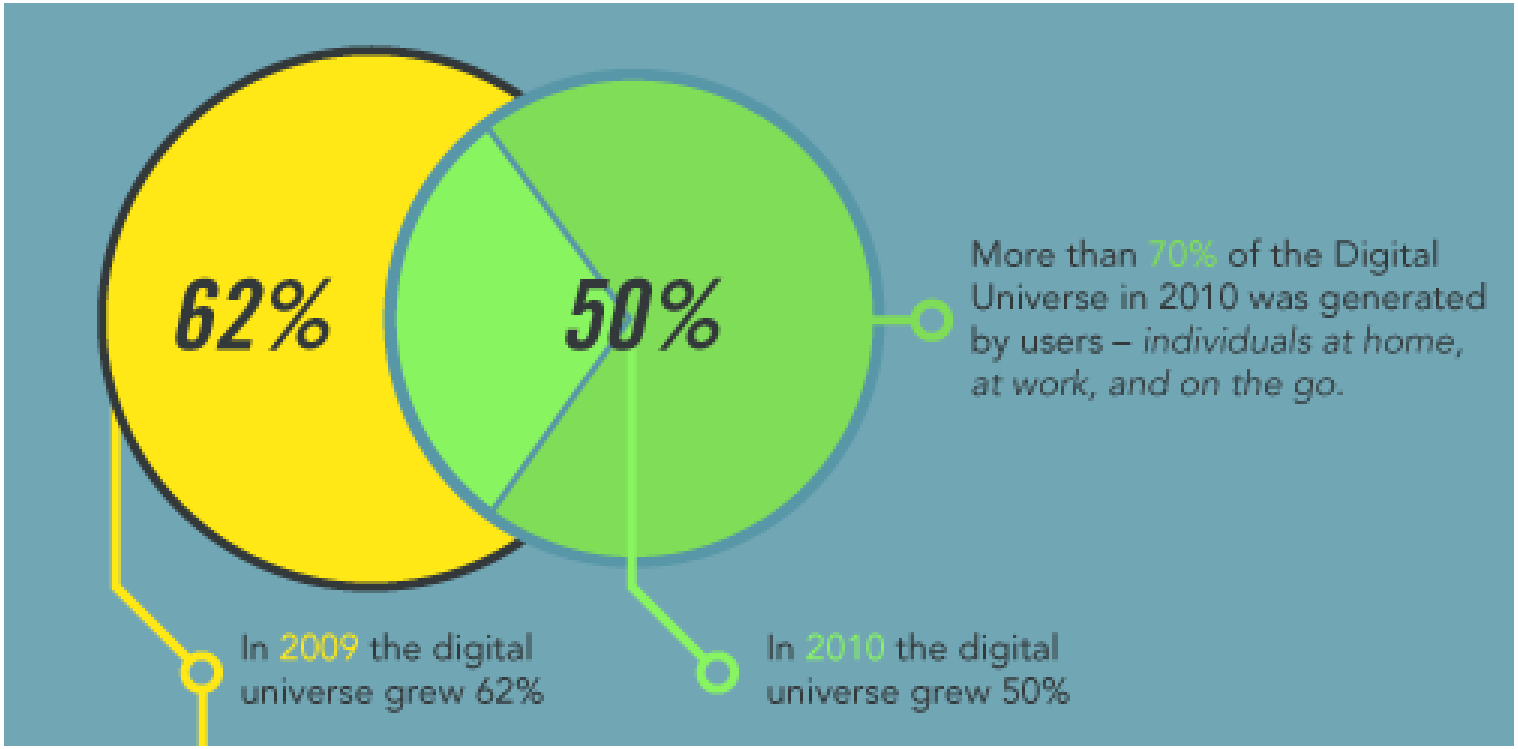
The Web itself is changing



http://www.flowtown.com/blog/have-we-reached-a-world-of-infinite-information?display=wide

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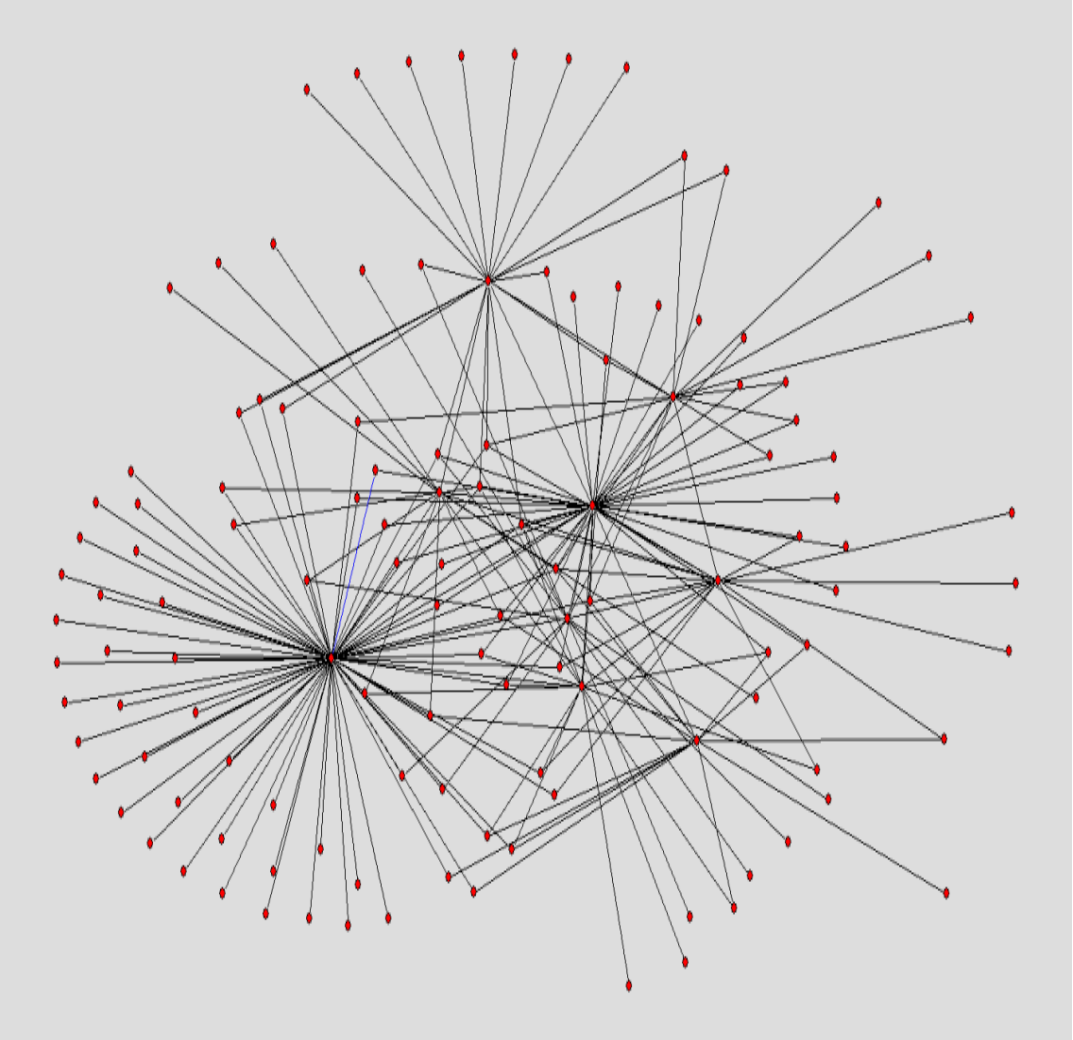
Connecting the dots: a changing research environment

- 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



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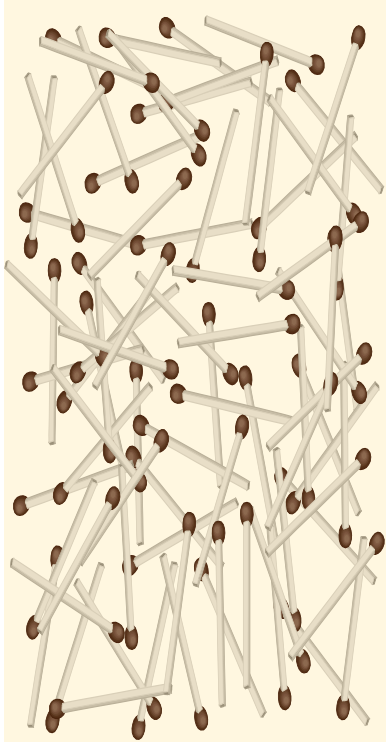
Challenges in capturing Big Data

meatmeter.blogspot.com

abovethelaw.com

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

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Design-based Research Approach

Design Based Research Approach	Design type	Research methods	Development phase	Evaluation phase	Dissemination phase
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'

Shedroff, 2009, p4.

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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 3: Usability testing of Plearn:

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

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

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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

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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

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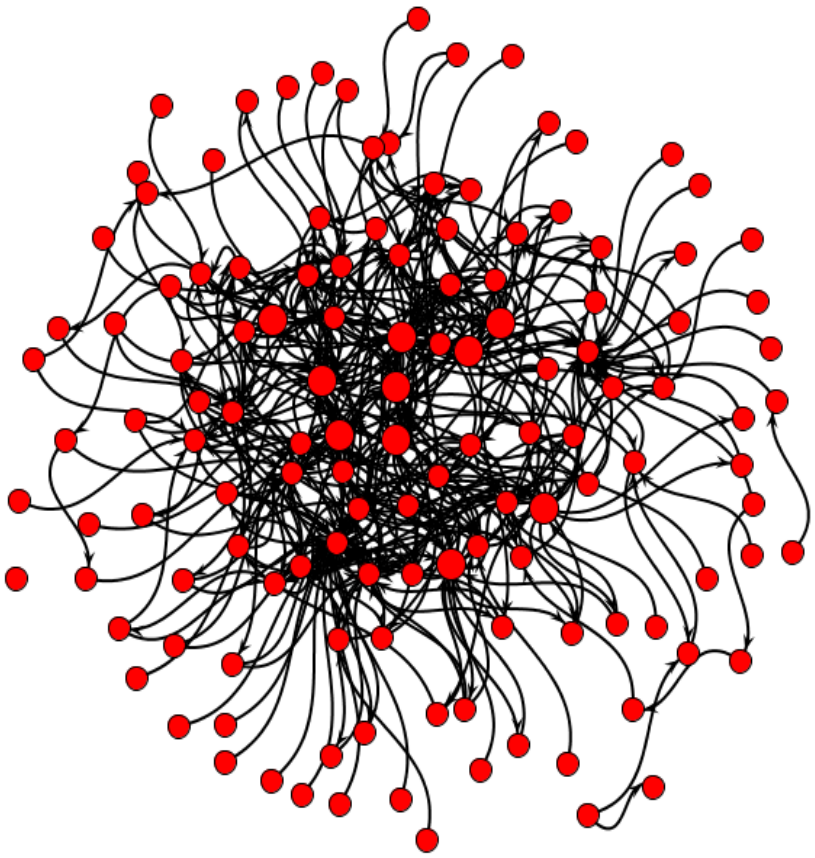
Why learning analytics?

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



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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

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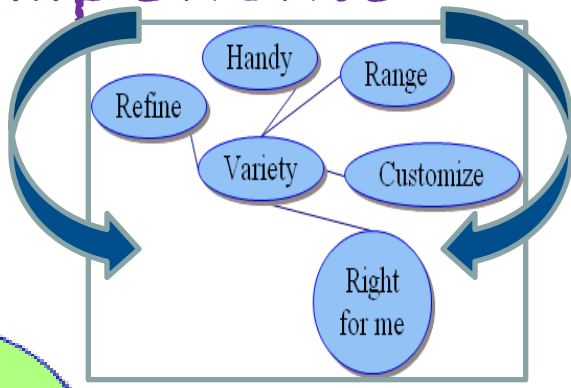
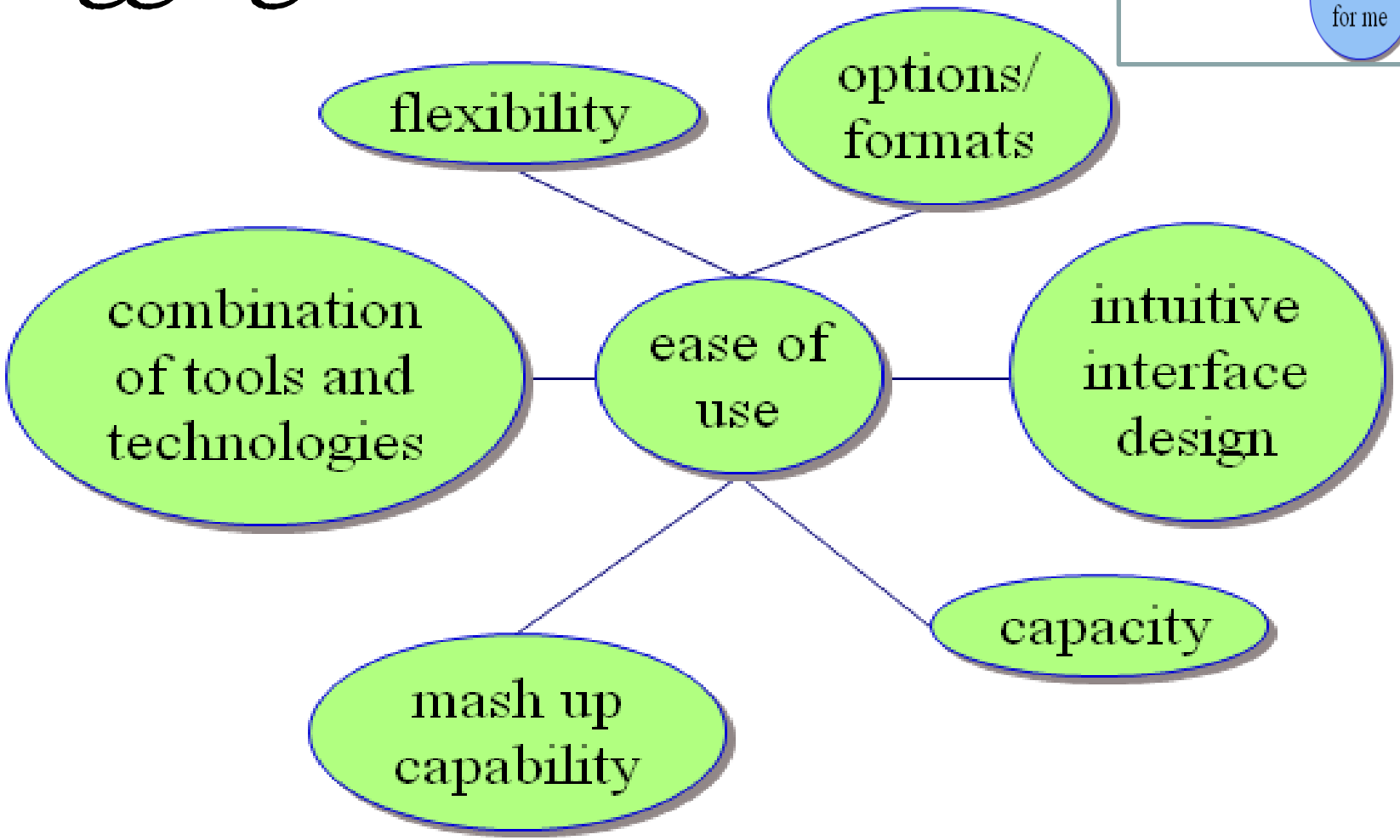
Survey Results First Phase

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

PLE Components



Aggregator + Editor



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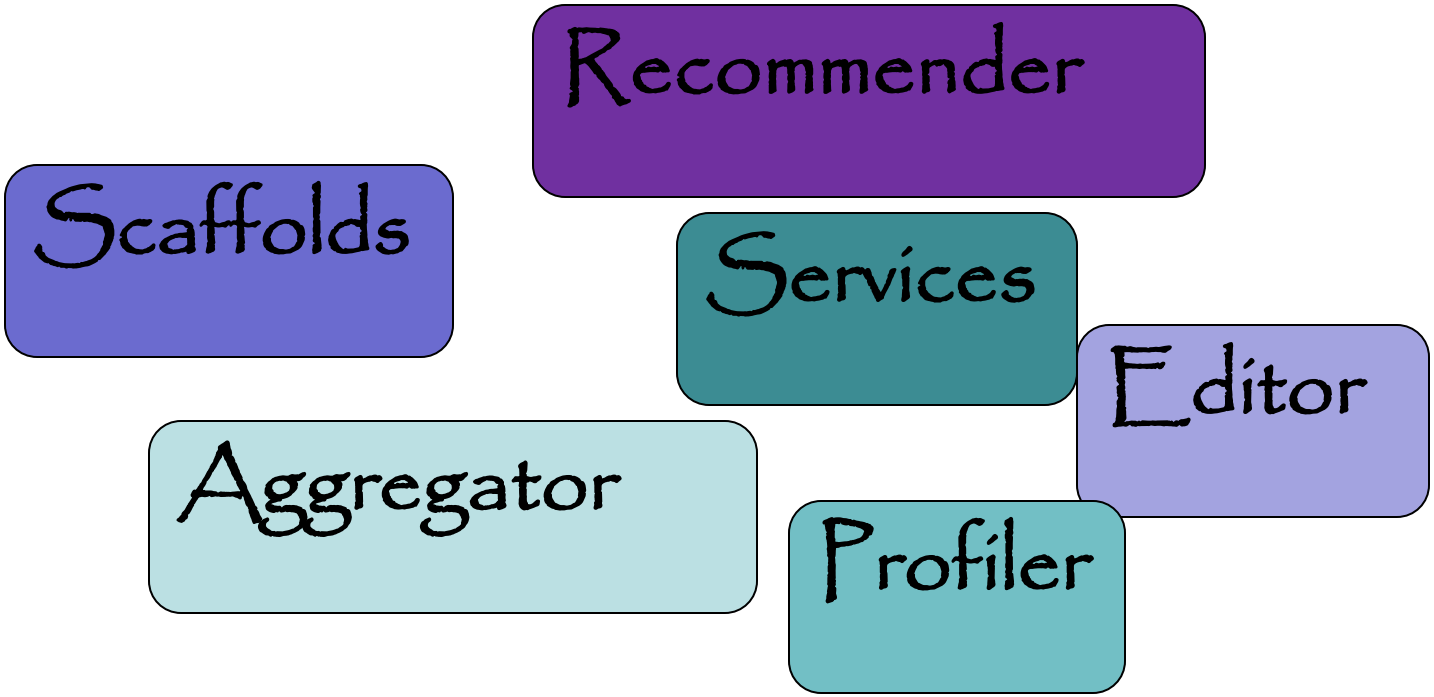
PLE Components



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Educational research: learning on a MOOC Phase 2

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MOOC poll

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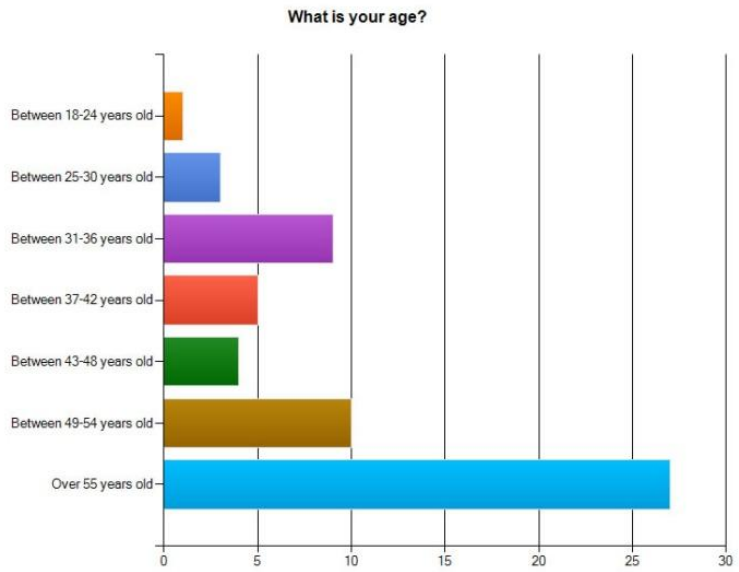
Who were the participants?



Participants' age

Participants' residence

Participants' professional background

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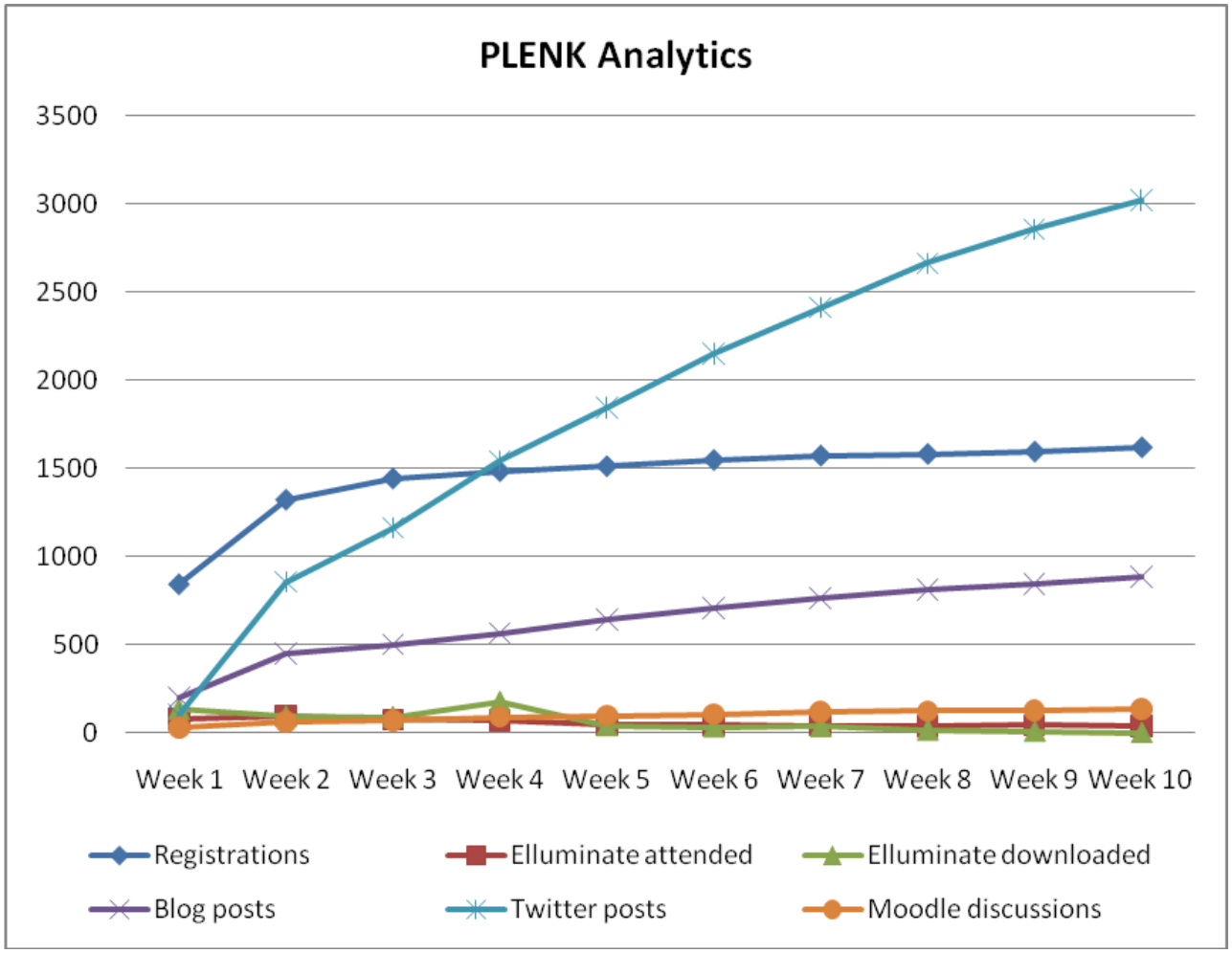
What did participants do?



PLENK participation rates

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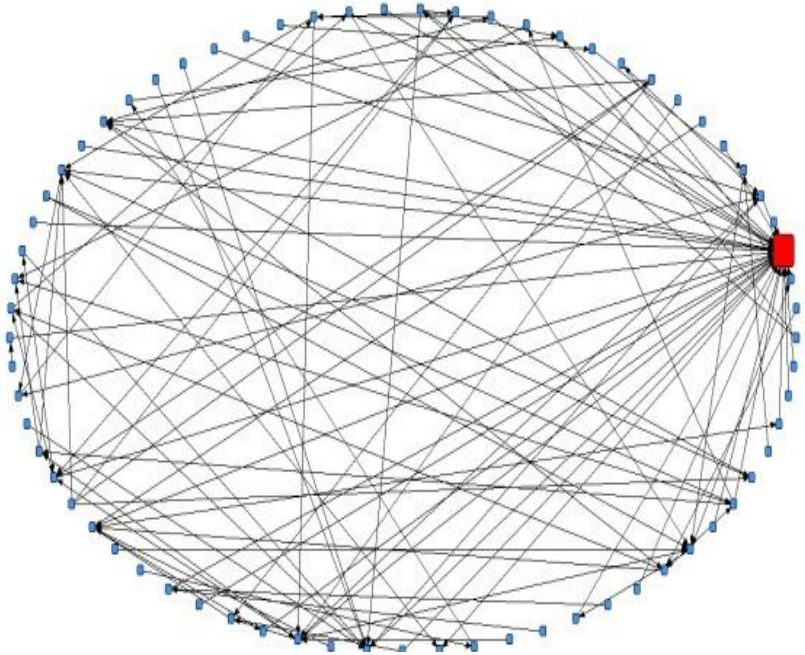
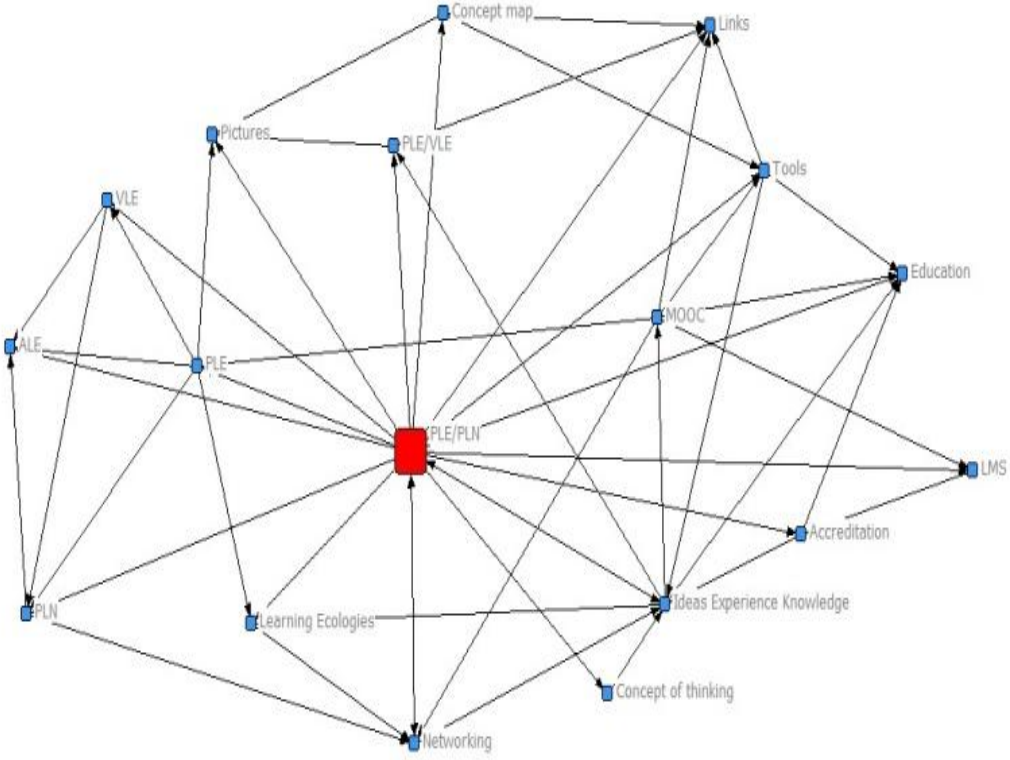
Interactions on the PLENK Moodle



The complex network a facilitator's post generated



Relationships between topics in a discussion in week 1

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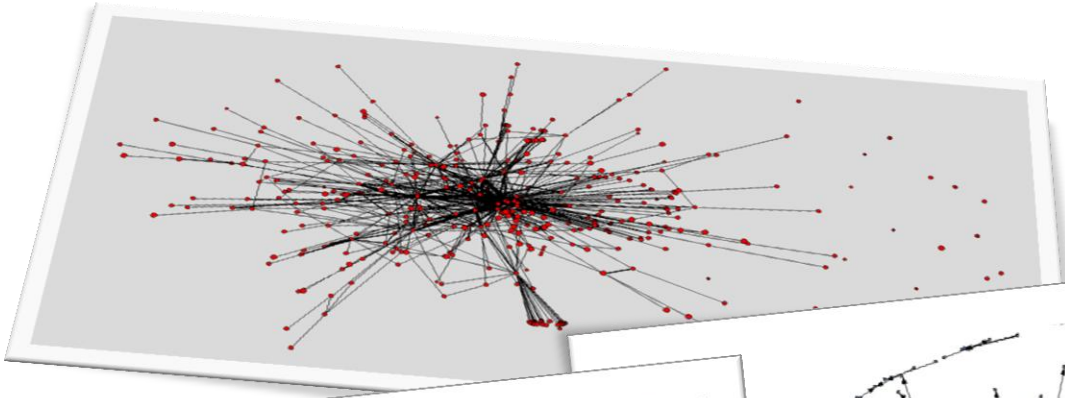
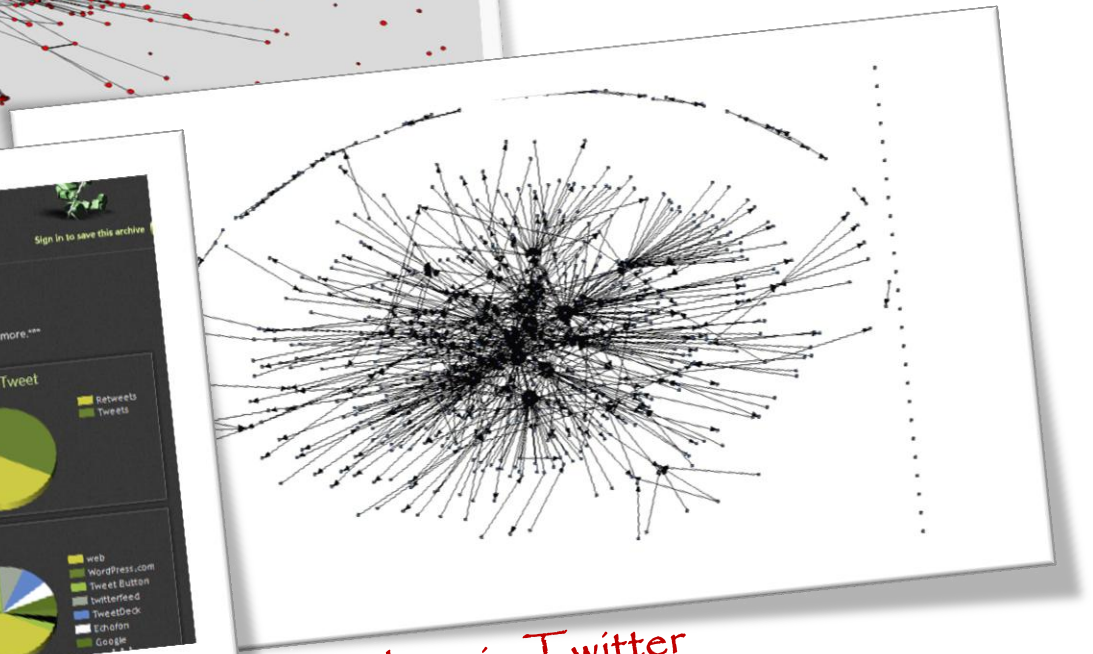
EXCEL + NETDRAW + PAJEK





Tweets for a week: Tweets, retweets, replies

Plenkers in Twitter

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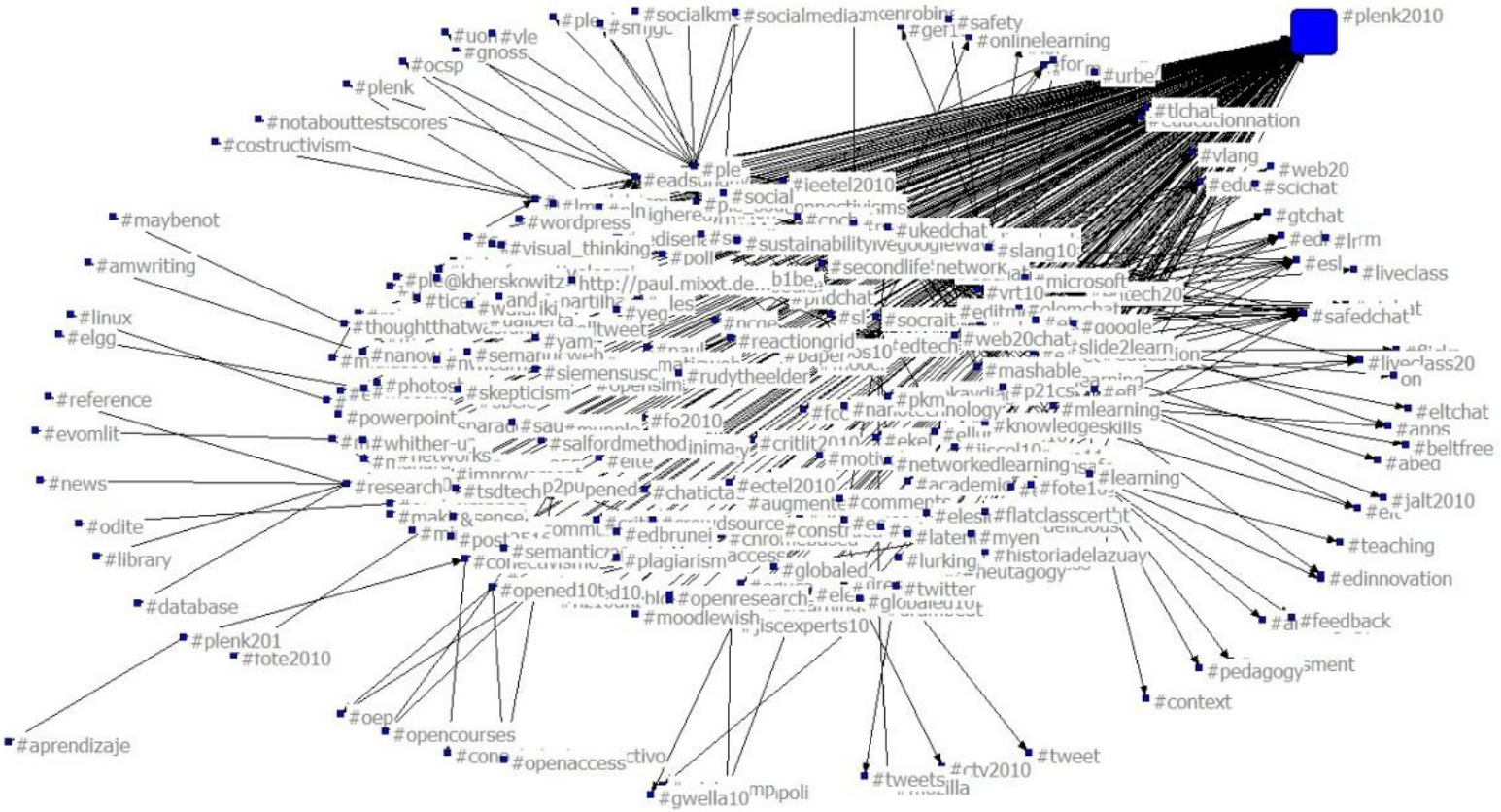
Twitter PLENK connections to hash-tag networks



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

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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

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Learner experience – novice

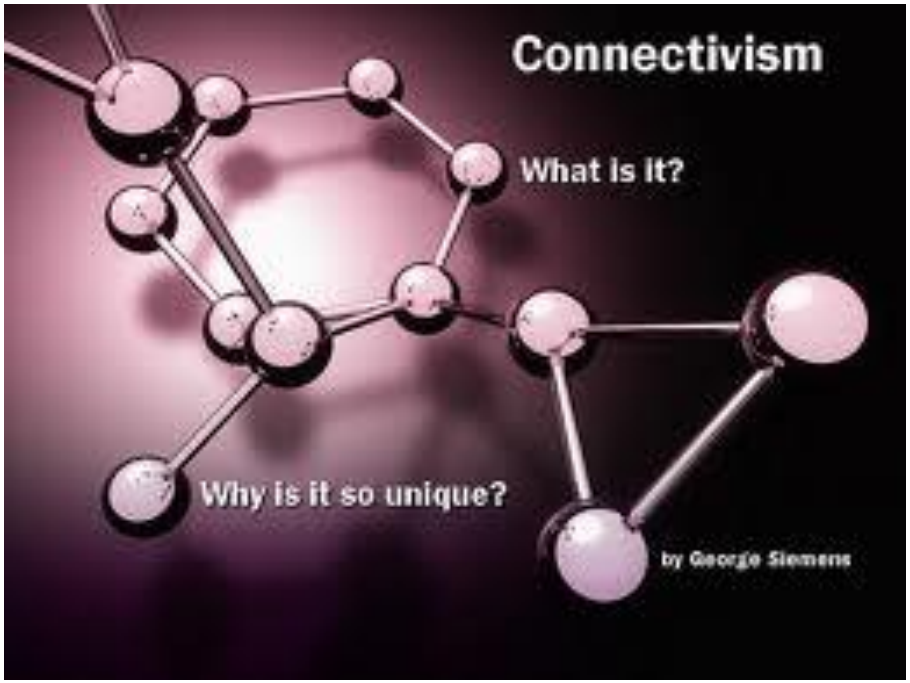
. . . I'm learning and contributing as I go. . . I'm getting more and more involved as I go on and as my comfort level increases. . . . PLNs, despite best intentions can be quite cliquey (sp?) and as a newcomer, that can be quite intimidating. Will I get more comfortable sharing and experimenting? You bet!

A participant

Active participation in connectivist learning

- Aggregating
- Remixing
- Repurposing
- Feed forward

(Downes, 2011)



profesorbaker.wordpress.com

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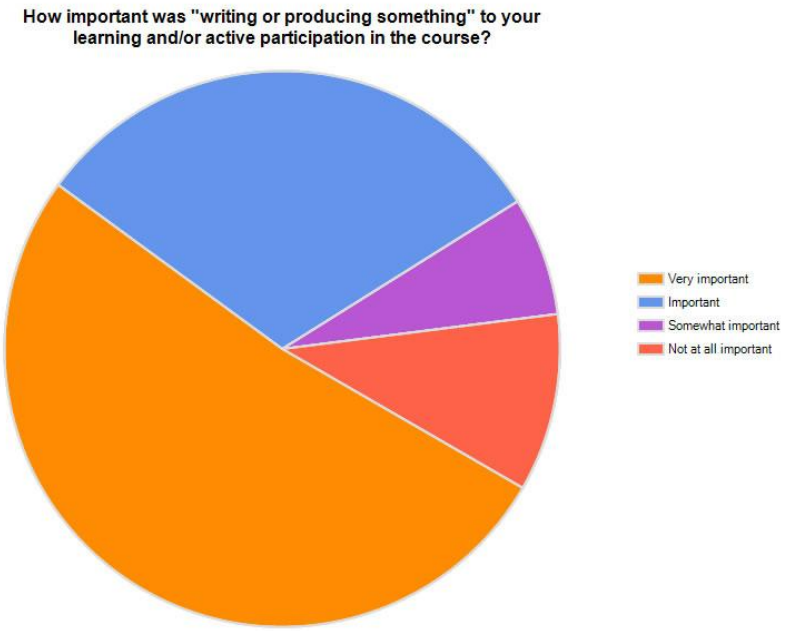
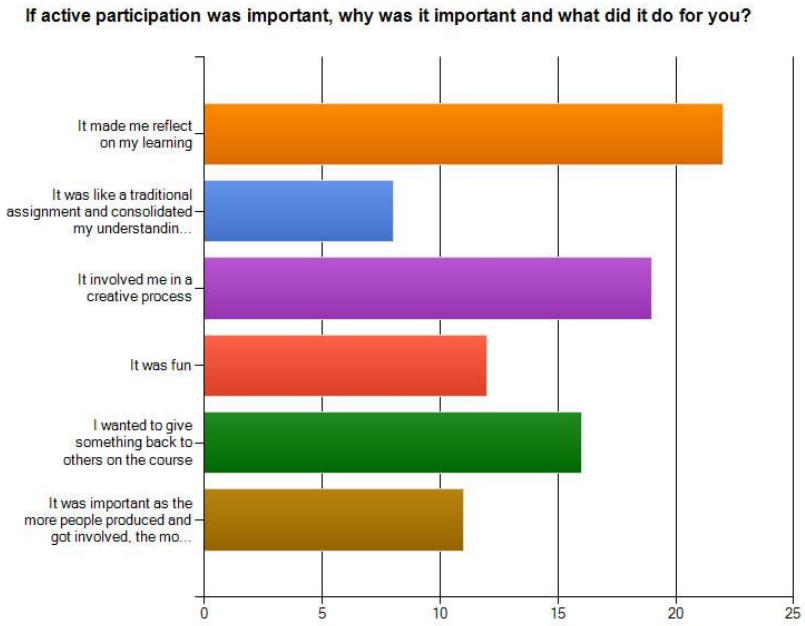
Importance of active participation



Importance of active participation



Why was active participation perceived to be important?

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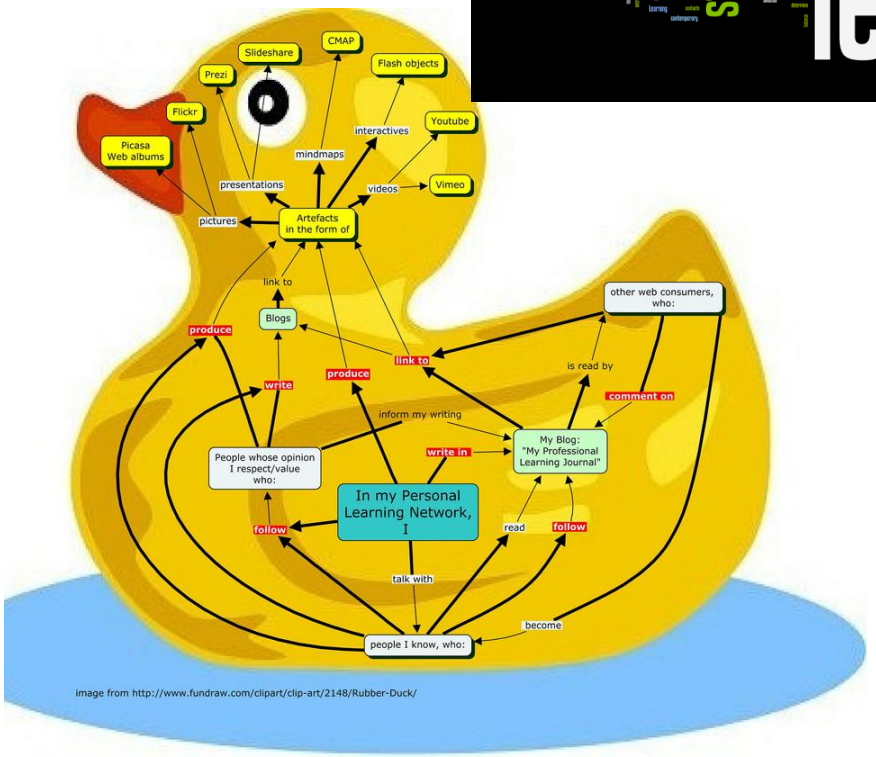
What did people produce?

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

http://zaidlearn.blogspot.com/2010/09/plenk-2010-most-awesome-course-on.html



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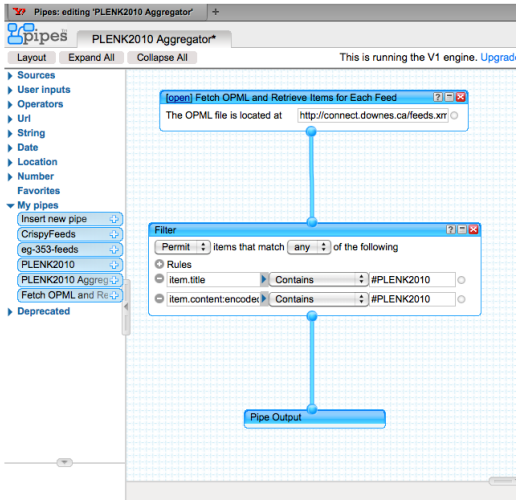
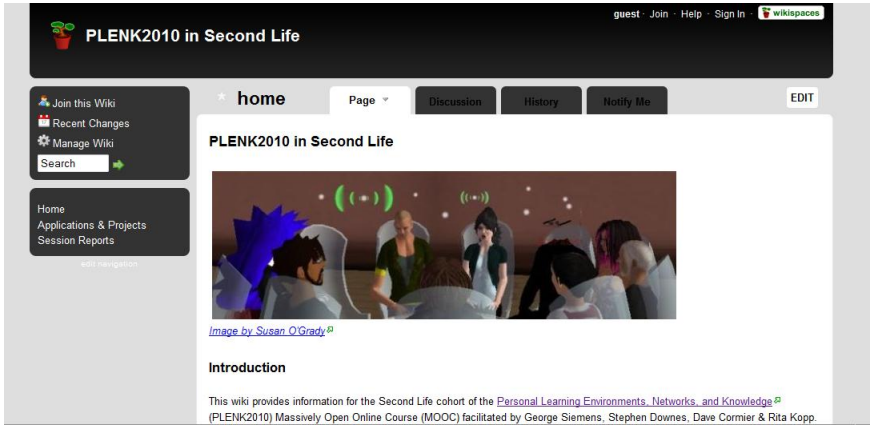
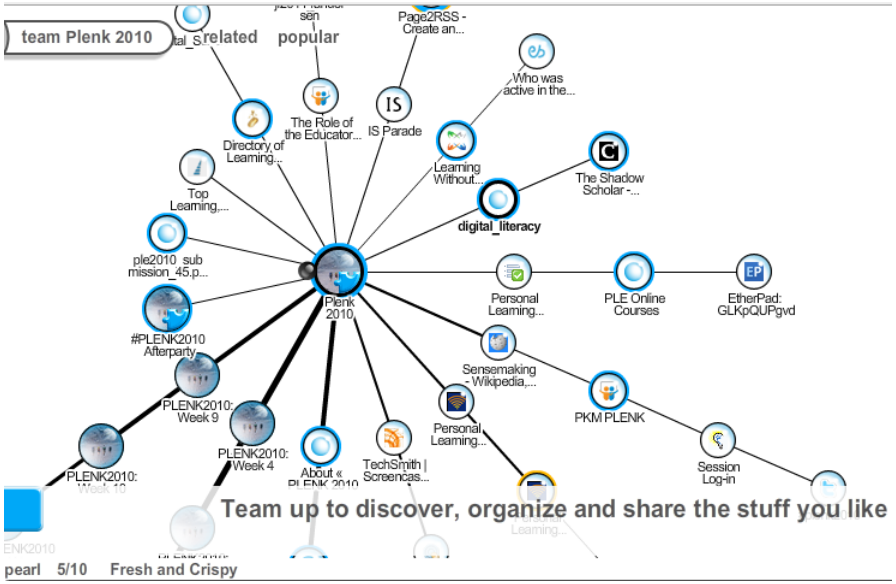
What did people produce?







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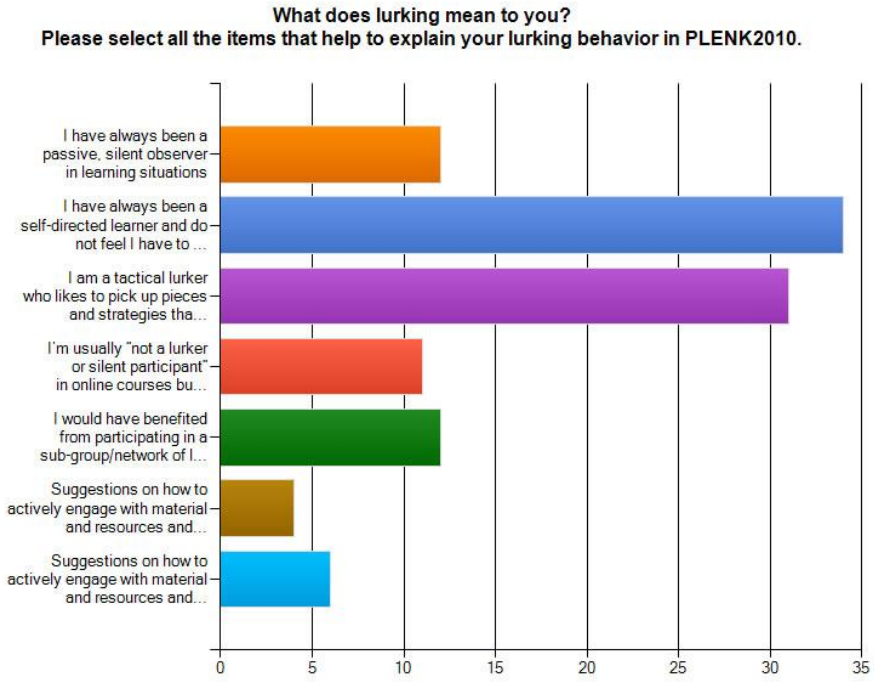
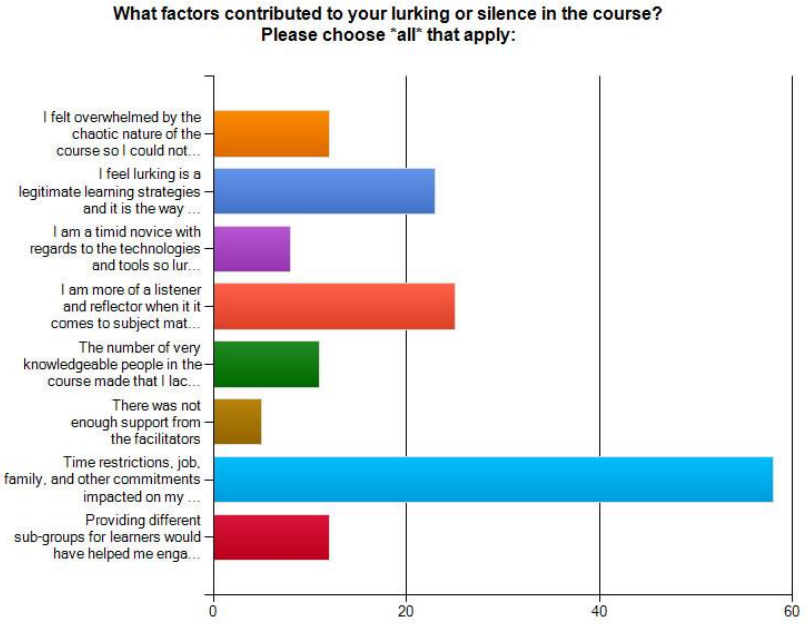
Why did people choose to 'lurk'?



PLENK perceptions around 'lurking'



Contributing factors to lurking behavior

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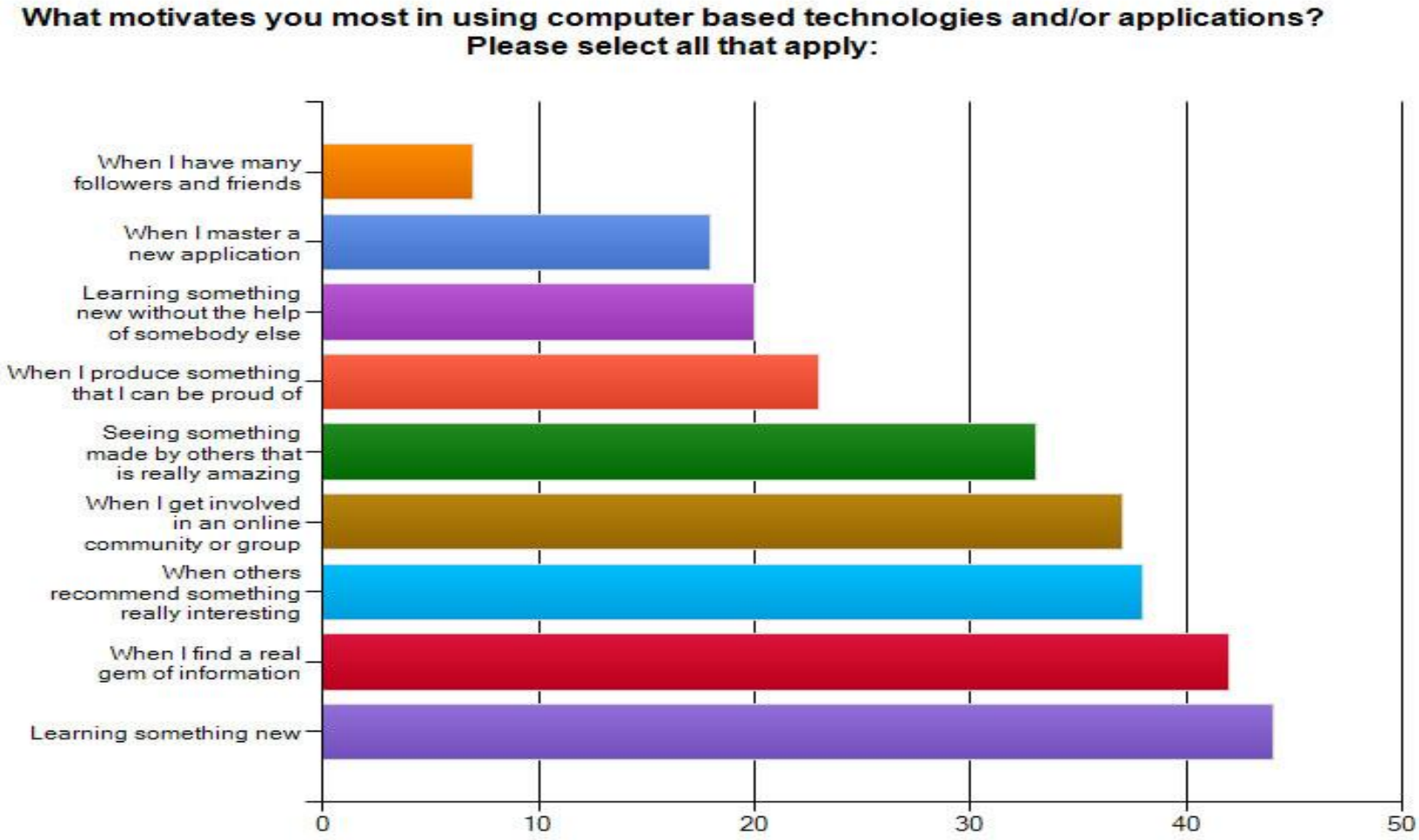
Motivational issues



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Conclusions – What did we learn?

- 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, PhD.
Frederika.Kop@nrc-cnrc.gc.ca

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References

- Downes, S. (2010). The Role of the Educator. Huffpost Education. 12 May, 2010. http://huff.to/g7Orh9
- Fournier, H., Kop, R. and Sitlia, H. (2011), The Value of Learning Analytics to Networked Learning on a Personal Learning Environment, 1st International Conference on Learning analytics and Knowledge 2011, Banff, February 27-March 1st, 2011, Paper 14. http://slidesha.re/eX5mlD
- Fournier, H. and Kop, R. (2010) Researching the design and development of a Personal Learning Environment, PLE Conference Barcelona 6-8 July 2010 . http://bit.ly/c5ehX4
- Illich, I. (1971) Deschooling society, Reprinted in 1978 by Marion Boyars, London
- Kop, R. (2011) The Challenges to Connectivist Learning on Open Online Networks: Learning Experiences during a Massive Open Online Course. The International Review of Research in Open and Distance Learning, Vol.12, No.3, http://www.irrodl.org/index.php/irrodl/article/view/882
- Pardo, A. and Kloos, C.D. (2011) Stepping out of the box. Towards analytics outside the Learning Management System, 1st International Conference on Learning Analytics, 28-2/1-3/2011, Banff, Alberta, Canada, Paper 4.
- Sharples, M., Taylor, J. and Vavoula, G. (2005), Towards a theory of Mobile Learning, the 2005 MLearn Conference, Cape Town, MLearn, http://bit.ly/mPv3LQ
- Shedroff, N. (2009). *Experience design 1.1, a manifesto for the design of experiences,* Experience Design Books, www.experiencedsignbooks.com
- Siemens, G. (2008). Learning and knowing in networks: Changing roles for educators and designers. ITFOURM for Discussion. Retrieved from http://www.ipcp.org.br/References/Education/Siemens.pdf
- Wel, van L., & Royakkers, L.(2004) Ethical issues in web data mining, Ethics and Information Technology, 6, 129-140