Structuration of Personal Learning Environments

Dr. Marco Kalz
Open University of the Netherlands
Marco Kalz

- **Assistant Professor** at the Centre for Learning Sciences and Technologies (CELSTEC) of the Open University of the Netherlands (OUNL)

- In 2001 he worked as a consultant in one of the first professional **content syndication** companies in Europe.

- From 2002 - 2003 he was involved in one of Germany’s **mobile campus initiatives** where he was researching the educational potential of mobile devices in traditional teaching formats.

- From 2004 - 2006 he worked in Educational Technology group at **Fernuniversität in Hagen**, Germany’s distance teaching university, where he was involved in the conception of **two new study programs** for educational technology.

- Since February 2006 Marco works at OUNL with a research focus on **new forms of assessment** and the use of **social software and social media** for lifelong competence development.
Structure of this talk

• PLE as empowerment concept
• Structurational view of PLE
• Operationalization of the theory
• Research challenges
Criticisms of the LMS

- Administrative Functions
- Controlled Cohorts
- Teacher with all rights
- Prepared courses
- Learners consume
- Limited communication
- No design freedom
- Instruction

Figure 7: The status of documents - static in transmissive pedagogics and living in active pedagogics

Schneider, 2003
Criticism of the LMS

Learning Management Systems:

The wrong place to start learning

November 22, 2004
George Siemens
Content Management Systeme aus bildungstechnologischer Sicht

Peter Baumgartner & Marco Kalz, Lehrgebiet Bildungstechnologie, FernUniversität Hagen

Erscheint in:

Einleitung

Early PLE concepts

Personal Learning Landscape

Elgg personal learning landscape

Social Networking (FOAF)

Personal file repository

Search

Weblogging (individual and groups)

CMS

LDAP authentication

Communities

Built on shared interests, each community is an instance of Elgg

1) Data will be available that shows which items, communities, and groups access within the GLOBE repository

GLOBE Global Learning Objects Brokered Exchange

Simple Query Interface (SQI) PHP Binding Layer

Powerful permissions. This is a key!

43 Things

Note: learners can completely customise their learning landscape through the templating system

All data in Elgg is an object wrapped in searchable metadata

Note: powerful permissions allow the learner to have complete control over who has access to what in their landscape

Note: A system like this would enable learners to not just be the consumers of information but also contributors

Wordpress

Note: learners can completely customise their learning landscape through the templating system

Friendster

Flickr

Delicious

Technorati

Livejournal

Other Elgg accounts

Elgg users can also search through all other Elgg users repositories

Simple Query Interface (SQI) PHP Binding Layer

2) This will be important as it will provide a good indicator of the most popular information

3) Which in turn will allow people to search and access data that is relevant to them!

Werdmuller 2004
A working definition

“Personal Learning Environments are learning environments where learners can integrate distributed information, resources and contacts and reflect about learning progress and learning products based on standards and interfaces”.

Schaffert/Kalz 2010
PLE vs. the rest
The proceedings
Some statistics

<table>
<thead>
<tr>
<th>Case studies</th>
<th>Theoretical/Technical papers</th>
<th>Empirical papers</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>30</td>
<td>3</td>
</tr>
</tbody>
</table>

36 papers
The educational significance of social media – a critical perspective

keynote debate at *Ed-Media conference 2010*, Toronto, 28th June to 2nd July

Neil Selwyn  
London Knowledge Lab  
Institute of Education - University of London, UK

n.selwyn@ioe.ac.uk
Problems for empirical PLE studies

• Complex relationship between technology, learners and learning effects
• How to avoid a technology-deterministic view?
• PLE framework vs. PLE instantiation
• Data collection
• Comparability
• End-users?
A conversation

@karisyd
Kai Riemer

If I read one more post: "E2.0 (or social technology) is changing the org..."! Face it, they don't do anything! People do!
#e20
10 Nov via Twitterrific

in reply to ↑

@mkalz
Marco Kalz

@karisyd This is the old black and white picture about technology and people. Don't underestimate technology as tools made by people #e20
11 Nov via web
A conversation

@mkalz
Marco Kalz

Reading too many statements "X is people and not technology" (X=E.20/TEL). We need a more integrated view of interaction between ppl/techn.

22 Nov via TweetDeck  Favorite  Reply  Delete
Structuration Theory

Anthony Giddens

British social theorist, born 1938. Prolific output. Theory of 'structuration' solved problem of whether individual acts, or major social forces, shape society, by asserting that it is human agency which continuously reproduces social structure. This relationship means individuals can bring change. In the 1990s, Giddens fashioned theory on how selves find meaning, and create narratives of identity, in modern society.

For more, see www.theory.org.uk/giddens

STRENGTHS: Social analysis mixing classic and modern
RISKS: Misguided postmodernists may attack
SPECIAL SKILLS: Appreciation of impact of feminism

CELTEC
celstec.org
Structuration Theory

Rose, 2001
## Structuration Theory

<table>
<thead>
<tr>
<th>Structure</th>
<th>signification</th>
<th>domination</th>
<th>legitimation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modality</td>
<td>interpretive scheme</td>
<td>facility</td>
<td>norm</td>
</tr>
<tr>
<td>Interaction</td>
<td>communication</td>
<td>power</td>
<td>sanction</td>
</tr>
</tbody>
</table>

[Diagram of Structuration Theory with additional connections between signification, domination, legitimation, interpretive scheme, facility, norm, communication, power, and sanction.]
Adaptive Structuration Theory

"Technology properties and contextual contingencies can play critical roles in the outcomes of advanced information technology use. The difficulty is that there are no clearcut patterns indicating that some technology properties are contingencies consistently lead to either positive or negative outcomes" (DeSanctis & Poole 1994, S. 124).
A structurational perspective of technology use

Orlikowski & Robey, 1991
### Theoretical foundation

<table>
<thead>
<tr>
<th>Arrow</th>
<th>Type of Influence</th>
<th>Nature of Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Information Technology as Product of Human Action</td>
<td>Information Technology is an outcome of such human action as design and development, appropriation, and modification</td>
</tr>
<tr>
<td>b</td>
<td>Information Technology as a Medium of Human Action</td>
<td>Information Technology facilitates and constrains human action through the provision of interpretive schemes, facilities, and norms</td>
</tr>
<tr>
<td>c</td>
<td>Conditions of Interaction with Information Technology</td>
<td>Institutional Properties influence humans in their interaction with information technology, such as, intentions, design standards, professional norms, state of the art in materials and knowledge, and available resources (time, money, skills)</td>
</tr>
<tr>
<td>d</td>
<td>Consequences of Interaction with Information Technology</td>
<td>Interaction with information technology influences the institutional properties of an organization, through reinforcing or transforming the systems of signification, domination, and legitimation</td>
</tr>
</tbody>
</table>

Table 1: Analysis relations for structuration (Orlikowski & Robey 1991)
Perspective a.) Technology as a product

„Designers incorporate some of these structures into the technology; the structures may be reproduced so as to mimic their nontechnology counterparts, or they may be modified, enhanced, or combined with manual procedures, thus creating new structures within the technology. Once complete, the technology presents an array of social structures for possible use in interpersonal interaction, including rules […] and resources” (DeSanctis/Poole 1994, S. 125).
Perspective a.) PLE frameworks

http://taolin.fbk.eu
Perspective a.) PLE frameworks

http://taolin.fbk.eu
Perspective a.) Artefact vs. use

Orlikowski & Robey, 1991
Perspective b.) PLE as a medium for human action

<table>
<thead>
<tr>
<th>Facilities</th>
<th>Norms</th>
<th>Interpretive Schemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g., hardware</td>
<td>e.g., protocols</td>
<td>e.g., assumptions</td>
</tr>
<tr>
<td>software</td>
<td>etiquette</td>
<td>knowledge</td>
</tr>
</tbody>
</table>

[CELSTEC celstec.org]
Perspective b.) Facilities

- Why do PLE users choose specific functionalities and not others?
- How do learners integrate these facilities with other facilities?
- How stable are facilities over the time?
Perspective b.) Norms

- Which normative framing influences the structuration process?
- Do norms that learners know from other learning experiences (e.g., the authority of an expert) get reassured or changed?
- Which social norms emerge especially when we look at a network of PLE in which learners self-organize their learning support via the integration of social networks etc.?
Perspective b.) Interpretative schemes

- What are assumptions & expectations of PLE users?
- Which prior experiences do they have with PLE or other learning technology?
- Which implicit, tacit & explicit knowledge do they apply?
Perspective c.) Institutional context of usage

University of the Basque Country/Casquero 2008
Perspective c.) Institutional context of usage
Perspective d.) Consequences of PLE usage

• What are the (unintended) consequences of using a PLE?
• How does the attitude towards institutional learning platforms change when universities offer PLE platforms?
• Which events have lead to new learning goals and opportunities?
Operationalizing structurational PLE studies

Process data
<table>
<thead>
<tr>
<th>Strategy</th>
<th>Fit with process data complexity</th>
<th>Specific data needs, key anchor and sensemaking</th>
<th>“Good Theory” Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grounding Strategies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grounded Theory</td>
<td>Adapts well to eclectic data and ambiguity. May miss broad high-level patterns.</td>
<td>Needs detail on many similar incidences. Key anchor: incidents, categories Sensemaking: meaning and patterns</td>
<td>High in accuracy, moderate simplicity. May be difficult to go from substantive theory to more general level.</td>
</tr>
<tr>
<td>Alternate Templates</td>
<td>Adaptable to various kinds of complexity. Different templates capture different elements.</td>
<td>One case is enough. Degrees of freedom come from multiple templates. Key anchor: theories Sensemaking: mechanisms</td>
<td>Each theory can be simple and general. Together they offer accuracy, but simplicity and generality disappear with theory integration</td>
</tr>
<tr>
<td><strong>Organizing Strategies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narrative</td>
<td>Fits with ambiguous boundaries, variable temporal embeddedness and eclecticism.</td>
<td>One or a few rich cases. Can be helped by comparison. Key anchor: time Sensemaking: stories, meanings, mechanisms</td>
<td>High in accuracy, lower in simplicity and generality.</td>
</tr>
<tr>
<td>Visual Mapping</td>
<td>Deals well with time, relationships, etc. Less good for emotions and interpretations.</td>
<td>Needs several cases in moderate detail to begin generating patterns. Key anchor: events Sensemaking: patterns</td>
<td>Moderate levels of accuracy, simplicity and generality.</td>
</tr>
<tr>
<td><strong>Replicating Strategies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporal Bracketing</td>
<td>Can deal with eclectic data, but needs clear temporal breakpoints to define phases.</td>
<td>One or two detailed cases are sufficient if processes have several phases used for replication. Key anchor: phases Sensemaking: mechanisms</td>
<td>Accuracy depends on adequacy of temporal decomposition. Moderate simplicity and generality.</td>
</tr>
<tr>
<td>Quantification</td>
<td>Focuses on events and their characteristics.</td>
<td>Needs many similar events for statistical analysis: one or a few dense cases is best. Key anchor: events, outcomes Sensemaking: patterns, mechanisms.</td>
<td>High simplicity, potentially high generality, modest accuracy.</td>
</tr>
</tbody>
</table>

Langley, 1999
Operationalizing structurational PLE studies

<table>
<thead>
<tr>
<th>The purpose established</th>
<th>Type of results achieved</th>
<th>Type of approach adopted</th>
<th>Type of strategy identified</th>
<th>Examples of studies</th>
<th>Strengths and weaknesses revealed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oriented toward the meaning of the process: They seek to understand interaction by identifying elements that shape organizational change or permanence.</td>
<td>Typologies and taxonomies; Frameworks and conceptual schemes; Narrative explanations</td>
<td>Process Approach</td>
<td>Grounded</td>
<td>Orlikowski (1993)</td>
<td>Strengths: In-depth understanding of process</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Template</td>
<td>Scarbrough (1995)</td>
<td>Weaknesses: low level of generalization, however analytical generalization is sometimes claimed (&quot;grounded&quot; approach). Such a need for generalization leads to the need for further studies in contexts similar to and/or different from the original setting(s)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Narrative</td>
<td>Orlikowski (1993)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Temporal-Bracketing</td>
<td>Orlikowski (1996)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Comparative</td>
<td>Orlikowski (1993)</td>
<td></td>
</tr>
<tr>
<td>Oriented toward the meaning of the process: They seek to make sense of the interaction by understanding interpretive meanings of technology.</td>
<td>Process Approach</td>
<td>Grounded</td>
<td>Robey and Sahay (1996)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Template</td>
<td>Lowstedt (1993)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Narrative</td>
<td>Sahay and Walsham (1996)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temporal-Bracketing</td>
<td>Barret and Walsham (1993)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comparative</td>
<td>Barret and Walsham (1993)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oriented toward prediction: They seek to explain the impact of IT by testing hypotheses derived from causal research models</td>
<td>Statements about tested hypothesis and causal models.</td>
<td>Variance Approach</td>
<td>Laboratory experiment</td>
<td>Chidambaram (1996) Miranda and Bostrom (1999)</td>
<td>Strengths: potentially high generalization</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Weaknesses: the attempt to study dynamic phenomena without longitudinal design, without the context and trying to experimentally control behavioral variables.</td>
</tr>
</tbody>
</table>

Pozzebon & Pinsonneault, 2001
Operationalizing structurational PLE studies

Pozzebon & Pinsonneault, 2001
Research challenges

• The competent actor
• Which effects are we analyzing (macro-level of learning or micro-level)?
• Generalizability problems
• Reinforcement of structures vs. transformation
• Which methods for process data?
• Interrelations between widgets
Thank you for your attention

Dr. Marco Kalz
marco.kalz@ou.nl
http://twitter.com/mkalz
http://www.marcokalz.de
http://celstec.org

"I think you should be more explicit here in step two."