

Open Source and Open Standards in e-learning research and development

Rob Koper

Director of Learning Technologies Research
Co-ordinator of the TENCompetence consortium

Open University of the Netherlands
TENCompetence Winterschool
22-26 Jan. 2007 Innsbruck



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Content

- Characteristics of e-learning research
(Technology Enhanced Learning or Advanced Learning Technologies Research)
- Use of Open Source and Open Standards in e-learning research (very short overview)
- Paper: dspace.ou.nl/1820/780
- Other references: dspace.ou.nl
www.tencompetence.org
www.learningnetworks.org



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Aim of e-learning research

E-learning can be **defined** as the use of information and communication technologies (ICTs) to facilitate and enhance learning and teaching



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Improve learning & teaching:

- by making it more *accessible* to everyone at any place and at any time;
- by making it more *effective* by facilitating the implementation of advanced pedagogical and organizational approaches;
- by making it more *efficient* by providing advanced (partly automated) support mechanisms for learners and teachers to perform their various tasks;
- by making it more *attractive* to users by providing adapted tasks and resources.



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As a consequence...

- Any e-learning research plan (eg a Ph.D. plan) should include a concrete objective in terms of how your work will contribute to one of these objectives:

How does your work make learning and/or teaching more:

- accessible*
- effective
- efficient*
- attractive*



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Positioning of e-learning research

- Technology-oriented research instead of theory-oriented
- What is the difference?
- Key issue: what counts as evidence for the body of knowledge?
- Compare:
 - hermeneutic research (e.g. historical research)
 - empirical research (e.g. medicine, exp. psychology)
 - hypothetico-deductive research (mathematics)
 - technological research (e.g. engineering, architecture)



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Differences in the ways in which:

- problems are addressed
- argumentation for evidence is build
- research activities are performed
- notation and communication means that are used
- the results that are delivered (theories, technologies, analysis, classifications, chain of reasoning, etc.)



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Technology

Mitcham (1994) states that: “Virtually all historians ... use the word ‘technology’ to refer to both ancient and modern, primitive and advanced making **activities**, or **knowledge** of how to make and use **artifacts**, or the artifacts themselves” (p.116).



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A distinction is made between:

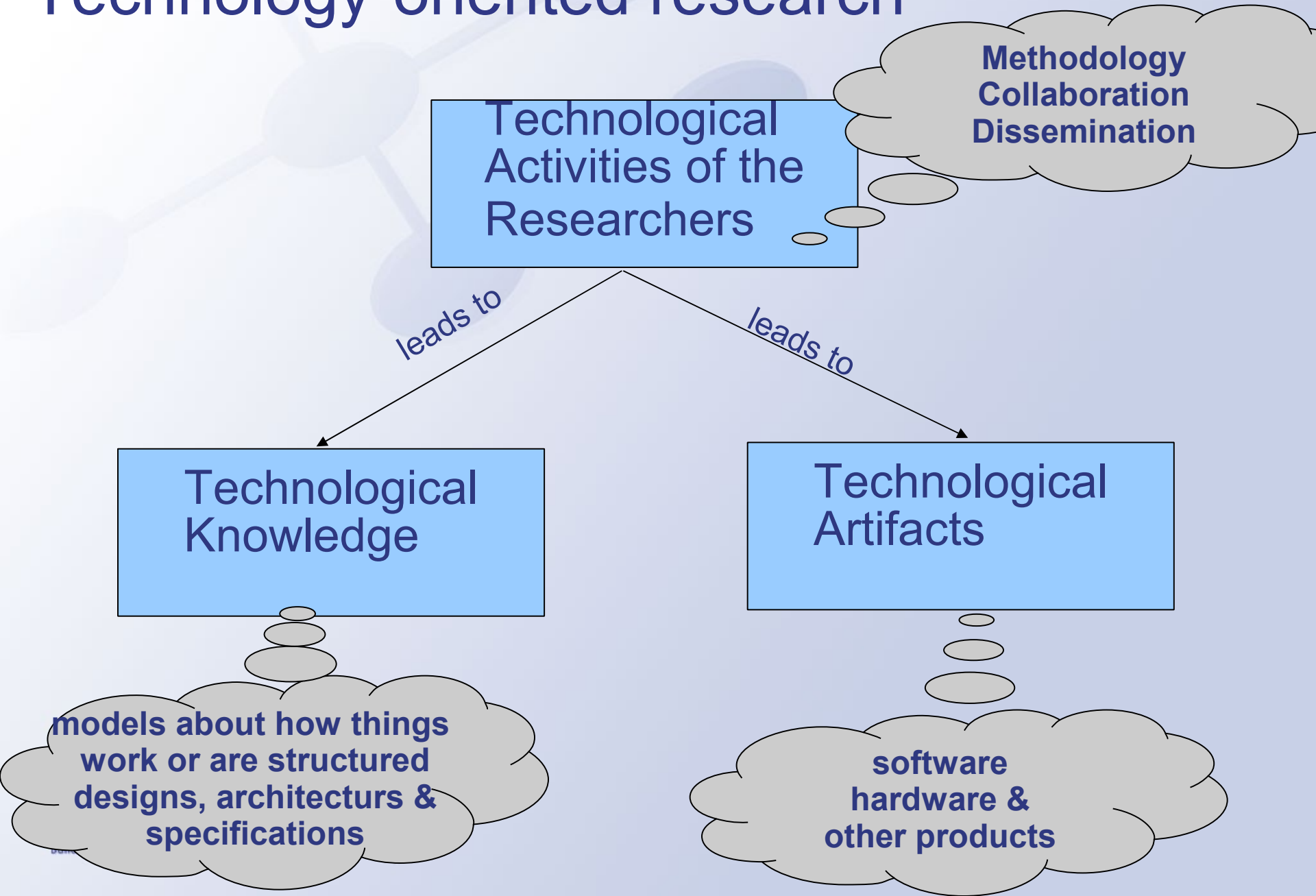
- 1.the *technological activities* of the researchers (methods for making an artifact) that leads to:
- 2.the *technological knowledge* that is a result of these making activities (models and specifications), and to
- 3.the *technological artifacts* that are the results of these activities



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Technology-oriented research



The role of Open Source & Open Standards in e-learning research

Basic questions:

- How does OSS/OS facilitate the technological activities of the researchers in terms of methodology, collaboration and dissemination of results?
- How does OSS/OS facilitate the development of technological knowledge in the field?
- How does OSS/OS facilitate the development of technological artifacts in the field?



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What is Open Source

Open source software is software that has one of the OSI Open Source Licenses attached.

These licences state that the source code of a program should always be made available to everyone and that everyone can change, use and (re-)distribute the source code and the compiled programme



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Open Source Development Model

- OSS is that it is developed in a different way than commercial software:
- Bazaar Model (Raymond):
 - (a) globally distributed communities of developers collaborating primarily through the Internet,
 - (b) developers working in parallel,
 - (c) developers exploiting the power of peer review for debugging and requirements analysis,
 - (d) rapid, incremental release schedules, and
 - (e) projects with pools of experienced and esteemed professional developers



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Can you provide some examples of Open Source Apps?

- operating systems
- services at the server
- applications at the client
- open source projects
- collaborative environments for OSS



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Open Source Apps in e-learning

- Why is it hard to distinguish e-learning apps from more general open sources apps?
- Provide some specific examples of OSS e-learning apps



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Open Standards

Open standards are **commonly agreed upon** and published **specifications** of the conventions used in a community to ensure the **quality** and/or **interoperability** of products and services.



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Standards are defined and used

- Within communities
- There can be different competing standards in different communities (give some examples?)
- Many different distinctions are made, like:
 - Open standards and Closed standards
 - Industry standards and Official standards
 - Expert standards and Country, Region, World standards
 - Standards and Specifications
 - Standards and de-facto standards
 - etc.
- We use the word 'open standard' for every specification that complies to the definition given before



How are standards developed?

- Different processes, different organisations
- In e-learning:
 - ISO SC36 (highest level country model)
 - IEEE LTSC (expert model)
 - CEN/ISSS WSLT (Europe region)
 - NEN LT (Netherlands region)
 - IMS (industry consortium)
- For more info see paper



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OSS/OS in e-learning research?

- Major technological Activities in e-learning is in the development of new Learning Technologies
- Methodology: systems engineering principles (ADDIE)
- How OSS/OS facilitate:
 - a) by providing a standard notation systems to foster communication and collaboration (eg UML, XML, RDF)
 - b) by facilitating the development of the systems by multiple distributed users using the OSS development model (release early and often, involve the users, many eyeballs tame complexity, and given enough eyeballs, all bugs are shallow)
 - c) by facilitating the evaluation of the developed artifacts, and
 - d) by stimulating the dissemination of results.



Technological knowledge in e-learning

This knowledge is captured in:

- the UML diagrams that are used to design the system,
- the code of the system that has been developed,
- the documentation of the system that provides a user perspective of the system,
- the publications about the evaluation of the system.



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Artifacts in e-learning

- To build new artifacts many open source tools and libraries can be used (or adapted)
- Can you provide some examples?



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Thanks!

References:

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