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Beyond Instructional Design: Open Spaces and Learning Places

Stephen Downes, National Research Council Canada

Presented to:

American Distance Education Consortium (ADEC)

October 21, 2015

What is Instructional Design Anyway?

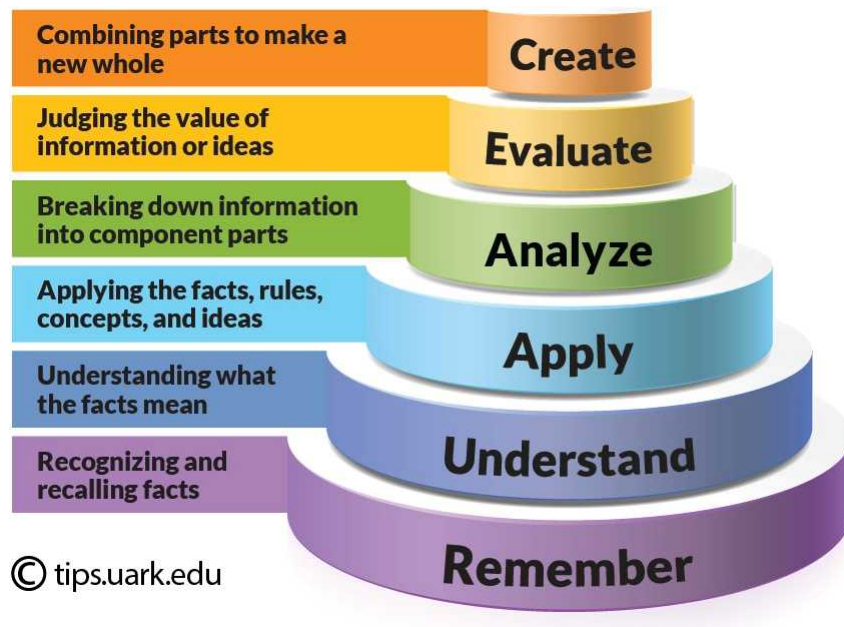
- “The practice of creating instructional experiences which make the acquisition of knowledge and skill more efficient, effective, and appealing.”
- The process, in general:
 - determining the current state and needs of the learner,
 - defining the end goal of instruction,
 - and creating some "intervention" to assist in the transition.

Yes, I cited Wikipedia:

https://en.wikipedia.org/wiki/Instructional_design

Some Core Concepts

- Taxonomies and types of learning
 - The role of learning objectives (aka outcomes)
 - Types of outcomes, for example, Bloom's Taxonomy

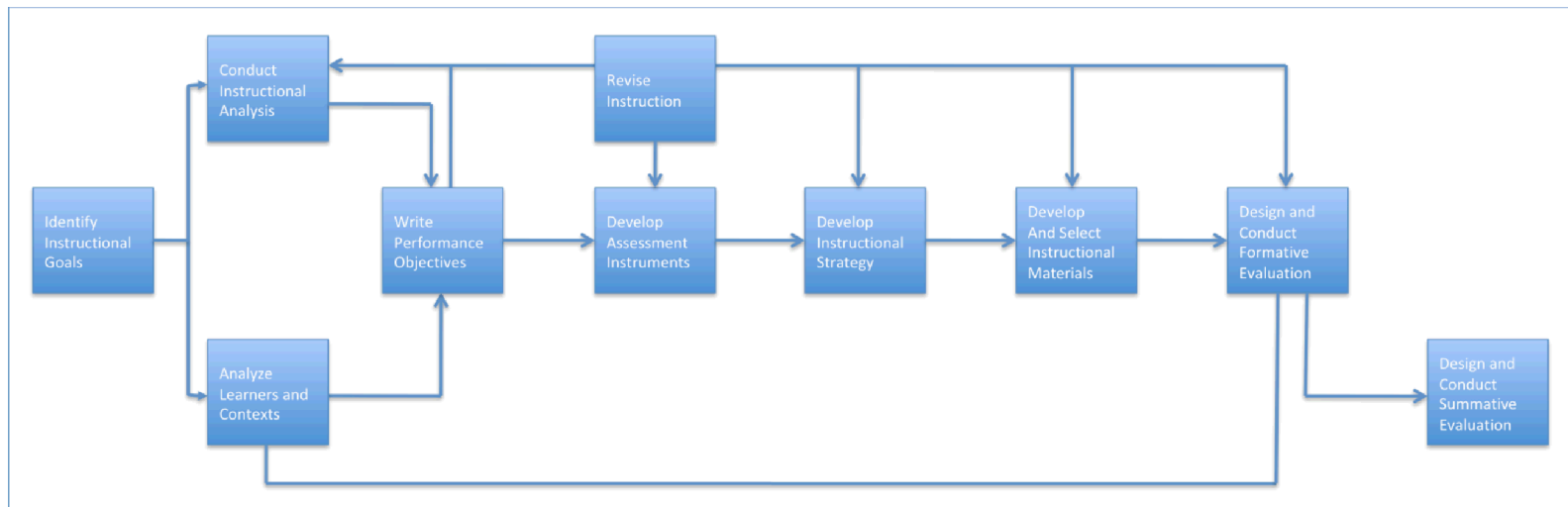


Yes, I'm still citing Wikipedia: https://en.wikipedia.org/wiki/Instructional_design

Image: <http://tips.uark.edu/using-blooms-taxonomy/>

Some Core Concepts

- The ‘process’ of learning – learning step-by-step
 - For example, Gagne’s nine events
 - Pre-requisites – “learners acquire prerequisite skills before attempting superordinate’s ones”

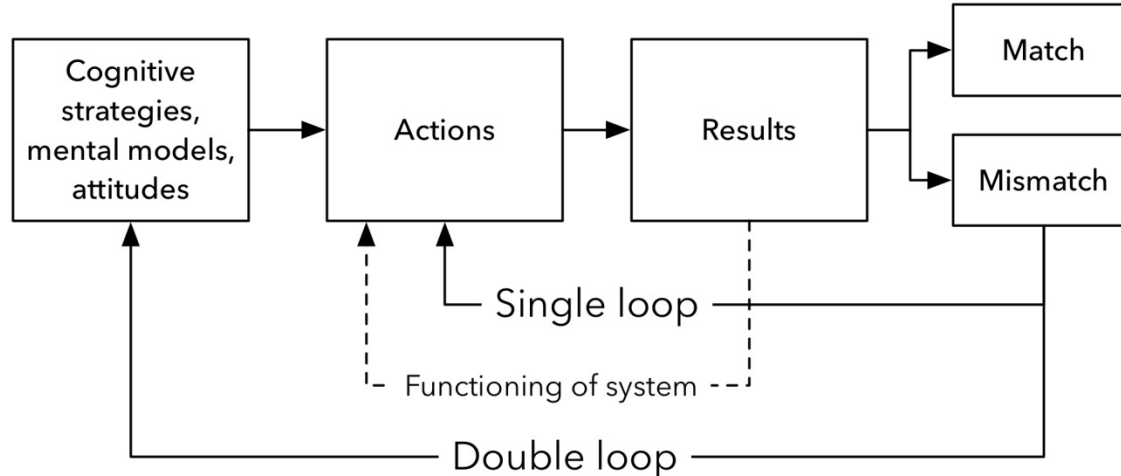


Yes, I'm still citing Wikipedia:

https://en.wikipedia.org/wiki/Instructional_design

More Core Concepts

- Instructional design process
 - ADDIE - analysis, design, development, implementation, and evaluation
 - Double Loop – learners' performance informs the design of the instructional process

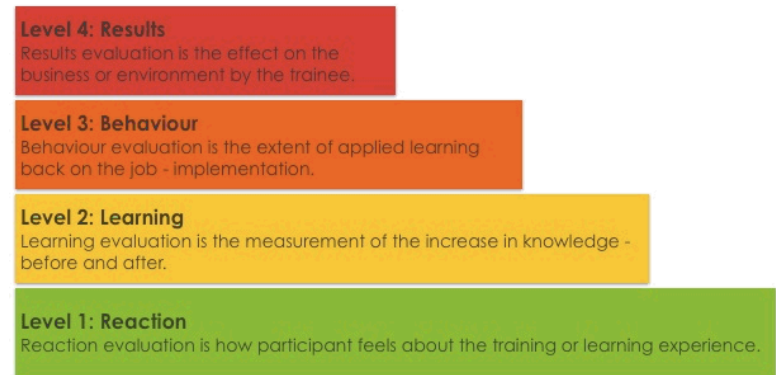


ADDIE: <http://educationaltechnology.net/the-addie-model-instructional-design/>

Double Loop from Argyris et al. 1985; see <http://infed.org/mobi/chris-argyris-theories-of-action-double-loop-learning-and-organizational-learning/>

More Core Concepts

- Transactional distance
 - M.G. Moore - “a psychological and communication space to be crossed, a space of potential misunderstanding between the inputs of instructor and those of the learner”.
 - Shaped by dialogue or interaction, structure of instruction
- Assessment and Evaluation
 - Formative vs Summative assessment
 - Learning design assessment
 - Kirkpatrick’s scale



Kirkpatrick's 4 Level Evaluation Model

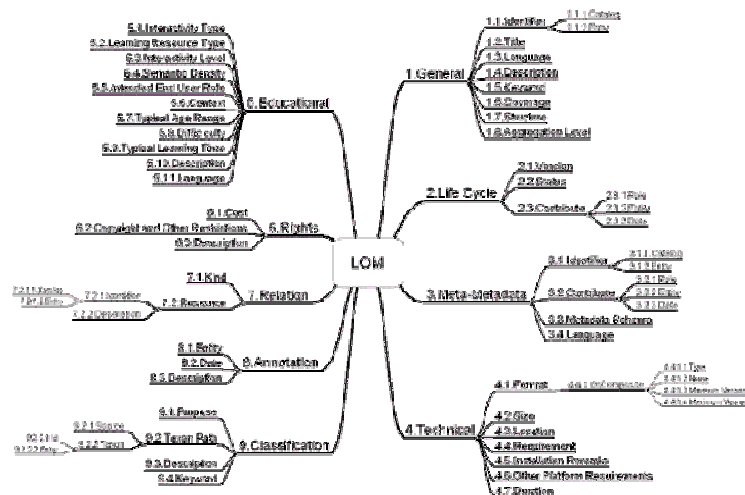
Moore: <http://www.c3l.uni-oldenburg.de/cde/support/readings/moore93.pdf>

Kirkpatrick: <http://www.kirkpatrickpartners.com/OurPhilosophy/TheKirkpatrickModel>

Image: <https://www.td.org/Publications/Blogs/Healthcare-Blog/2015/01/Measuring-Training-Success-in-Healthcare>

Some Contemporary Technologies

- Learning Management Systems (LMS)
 - Support the ‘intervention’ in the form of learning materials, quizzes and tests, interactions
- Learning Content Management System (LCMS)
 - Supports the creation of learning materials
 - Contents organized by taxonomies
 - For example, IMS Learning Object Metadata, Content Packaging

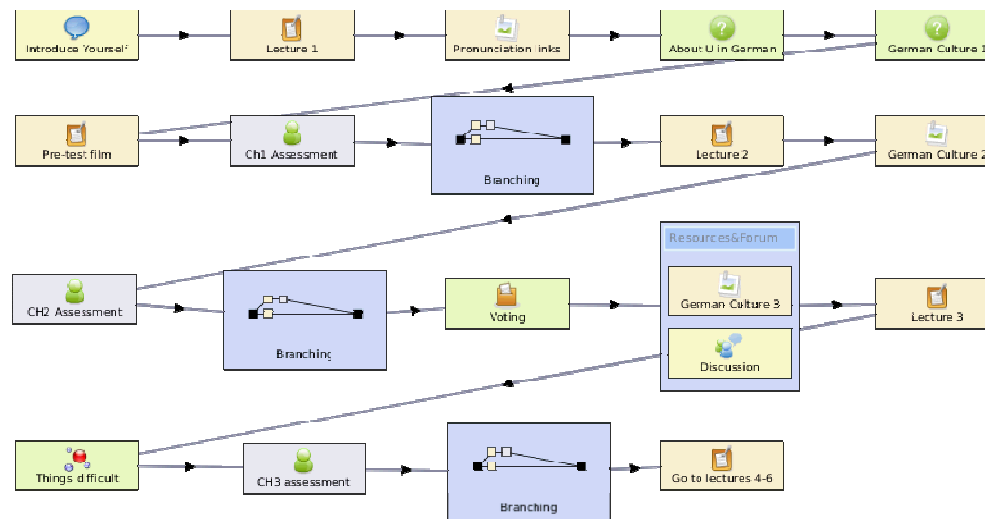


IMS LOM:

<https://www.imsglobal.org/metadata/index.html>

More Contemporary Technologies

- Content Sequencing
 - Ordering learning contents in the desired sequence
 - Evolved into IMS 'Learning Design'
 - Based on Rob Koper's "Educational Modeling Language"
 - Learning Activity Management System (LAMS) and other ID tools



IMS Learning Design: <http://www.imsglobal.org/learningdesign/index.html>

LAMS: <https://www.lamsfoundation.org/> LAMS Image: <http://www.mychrisalexander.com/lamslearningdesigns.htm>

Still More Contemporary Technologies

- Adaptive Learning
 - Orchestrates the provisioning of learning resources according to the individual needs of each learner
 - Elements or Models:
 - Expert model - The model with the information which is to be taught
 - Student model - The model which tracks and learns about the student
 - Instructional model - The model which actually conveys the information
 - Instructional environment - The user interface for interacting with the system

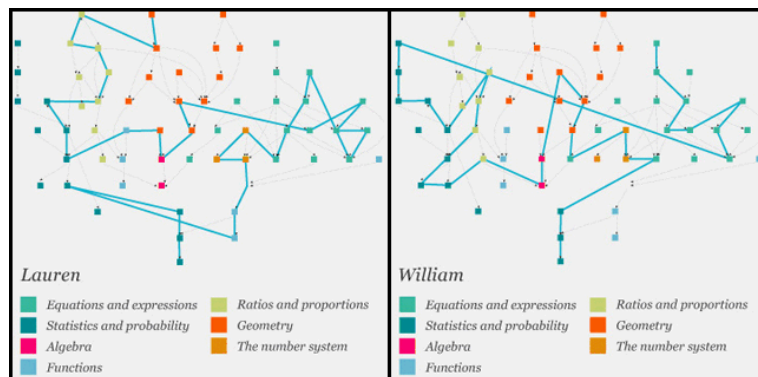
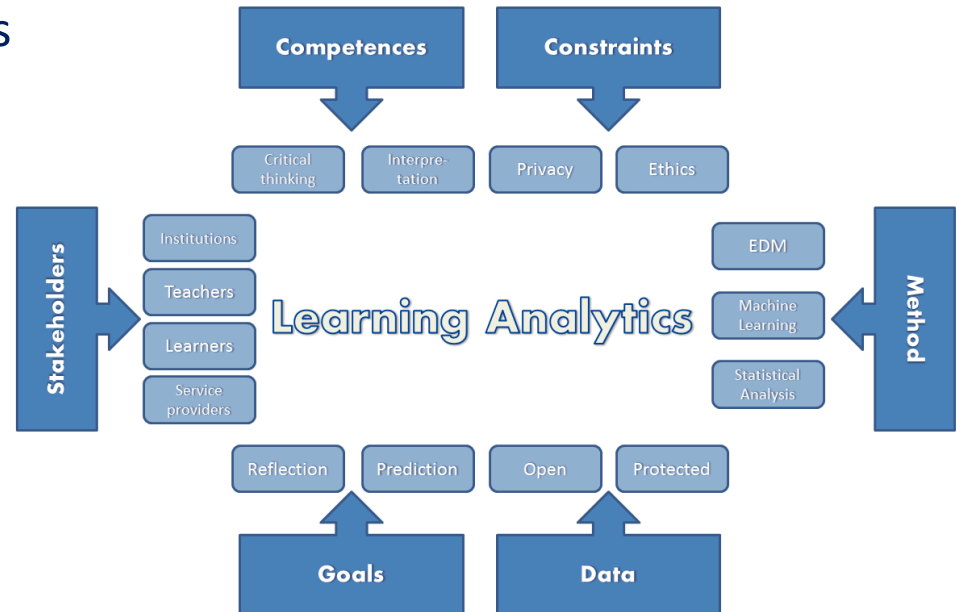


Image: Pearson <http://www.englishinstructorexchange.com/2013/08/06/the-role-of-adaptive-learning-in-developmental-education/> See also: https://en.wikipedia.org/wiki/Adaptive_learning

Still More Contemporary Technologies

- Learning Analytics
 - Data collection used to support adaptive learning
 - LAK11: “the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs.”
 - Predictive analytics – used to model likely learning outcomes and recommend interventions



LAK11: <https://tekri.athabasca.ca/analytics/>

Image: <http://www.greller.eu/wordpress/?p=1467>

Today's Technologies

- Social Networks and Learning
 - Social networks as formal learning environments
 - Learning communities
- MOOCs
 - xMOOC – content
 - cMOOC – social
- Integrated Environments
 - IMS LTI
 - Knewton

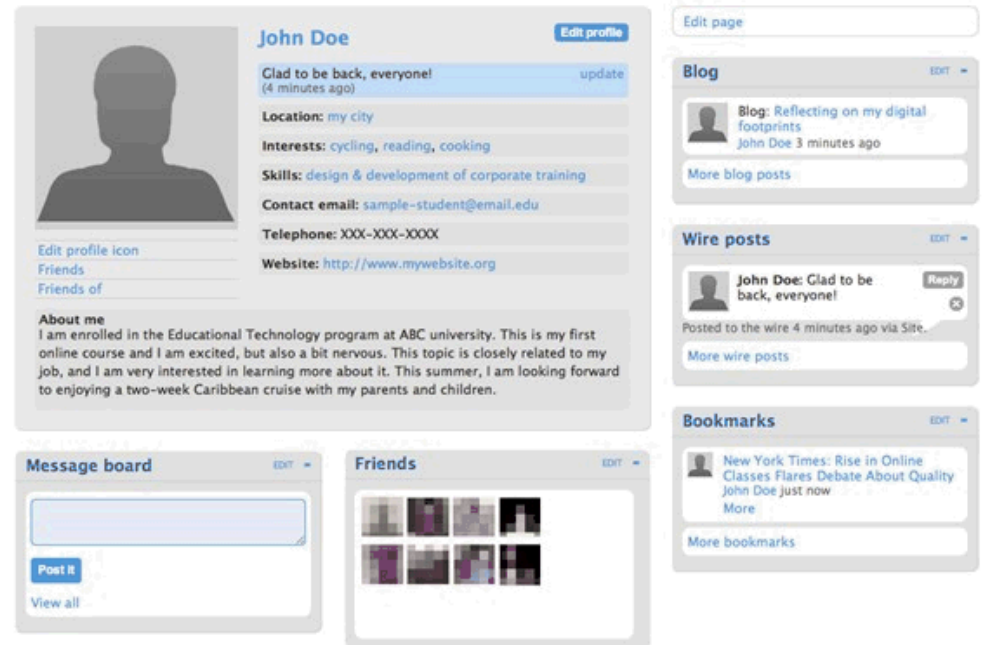


Figure 2. Student profile.

Formal learning environments: <http://www.irrodl.org/index.php/irrodl/article/view/1078/2077>

Knewton: <https://www.knewton.com/>

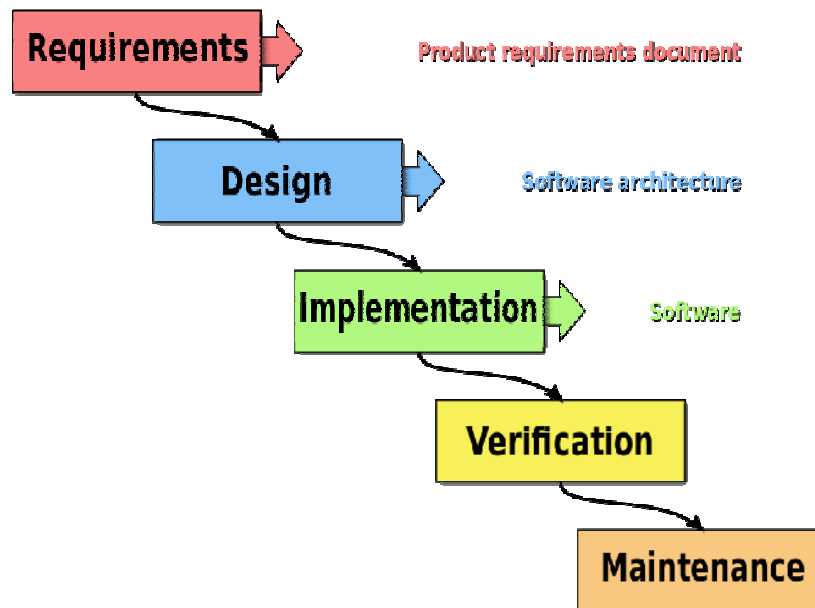
Interlude: Types of Games

- Quiz Games –question and answer format
 - Like Jeopardy, they test memory
- Branch and Tree Games
 - Board games, for example
 - Snakes and Ladders, Monopoly
 - Early Video games
 - Eg. the LaserDisc games
- Open-Ended Environment
 - Sports, like hockey, baseball, etc.
 - Pretty much every video game after the laser disc games



Planned versus Open-Ended Development

- Waterfall: like ADDIE
- Agile: like open-ended environments



Knowledge Translation

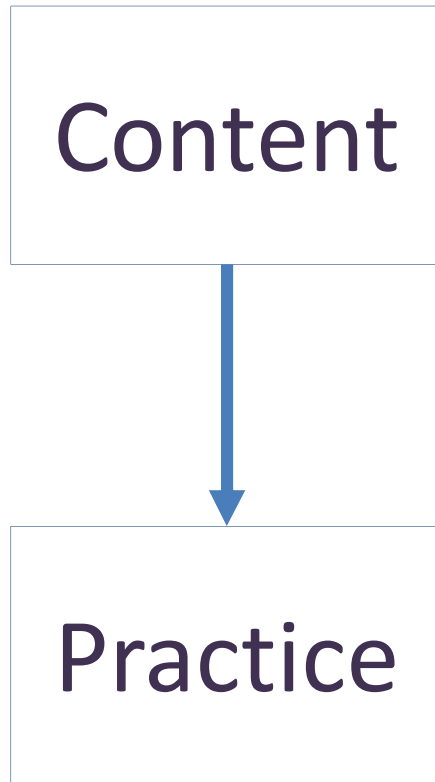
- CIHR – “CIHR, knowledge translation (KT) is defined as a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge to improve the health of Canadians.”

Criticisms of Knowledge Translation

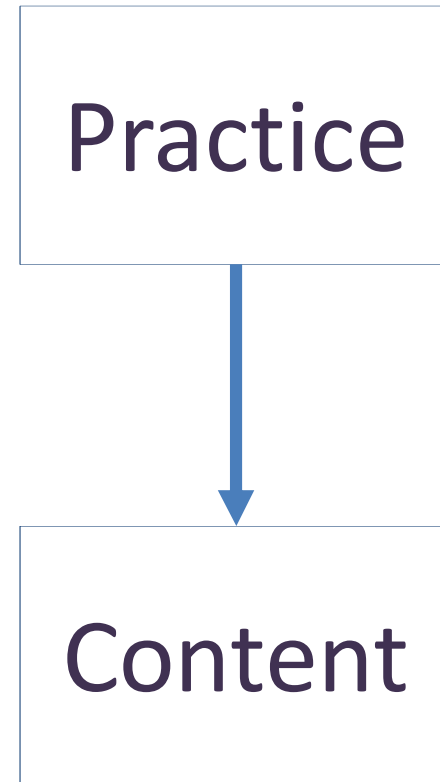
- “research should move beyond a narrow focus on the ‘know–do gap’ to cover a richer agenda...”
 - situation-specific practical wisdom (phronesis)
 - tacit knowledge shared among practitioners (‘mindlines’)
 - complex links between power and knowledge; and
 - macro-level knowledge partnerships

Design vs Environment

Design



Environment



Design vs Environment

Defines an ideal state

Content



Practice

TEST

Person tests you

Defines a desired state

Practice



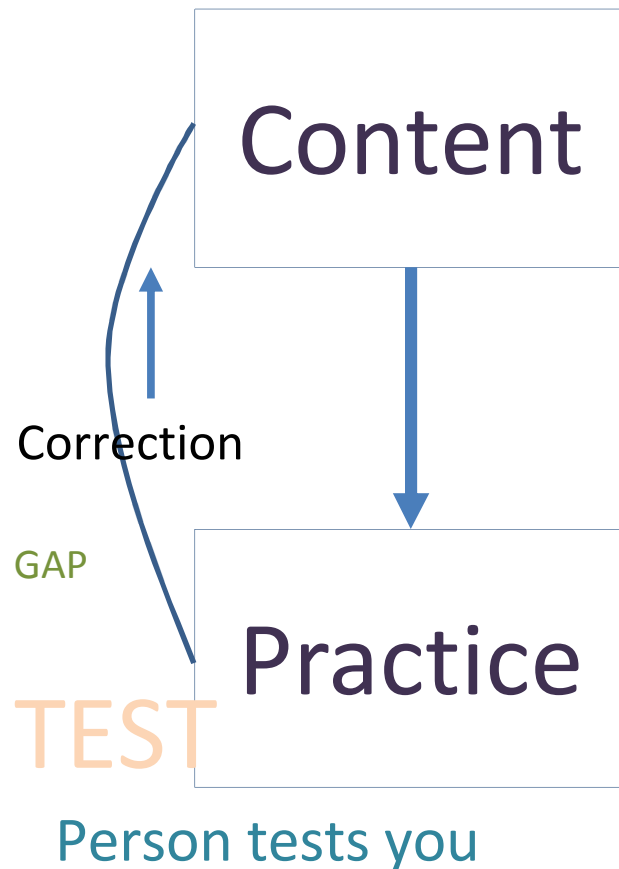
Content

TRY

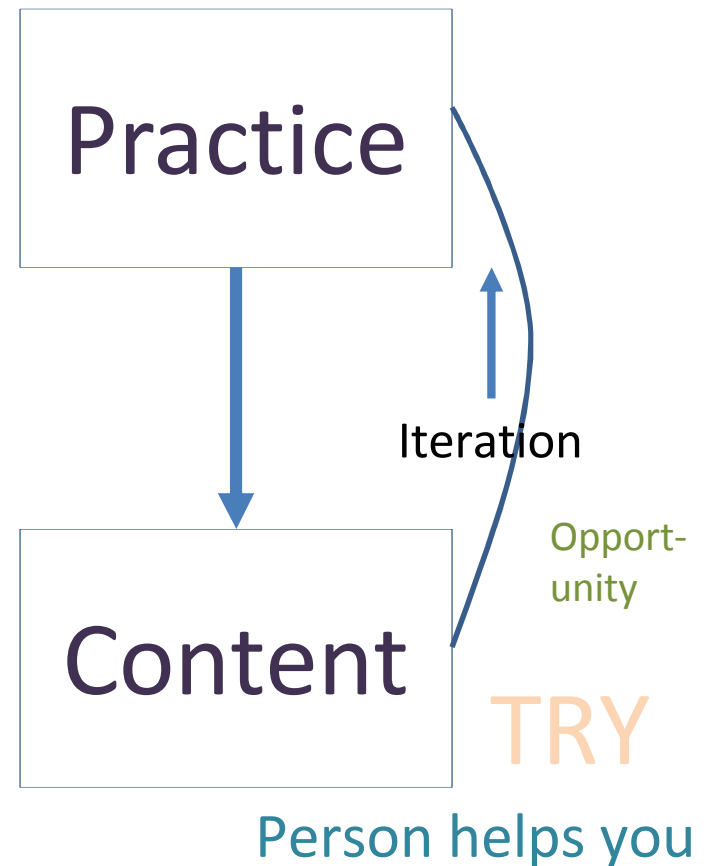
Person helps you

Design vs Environment

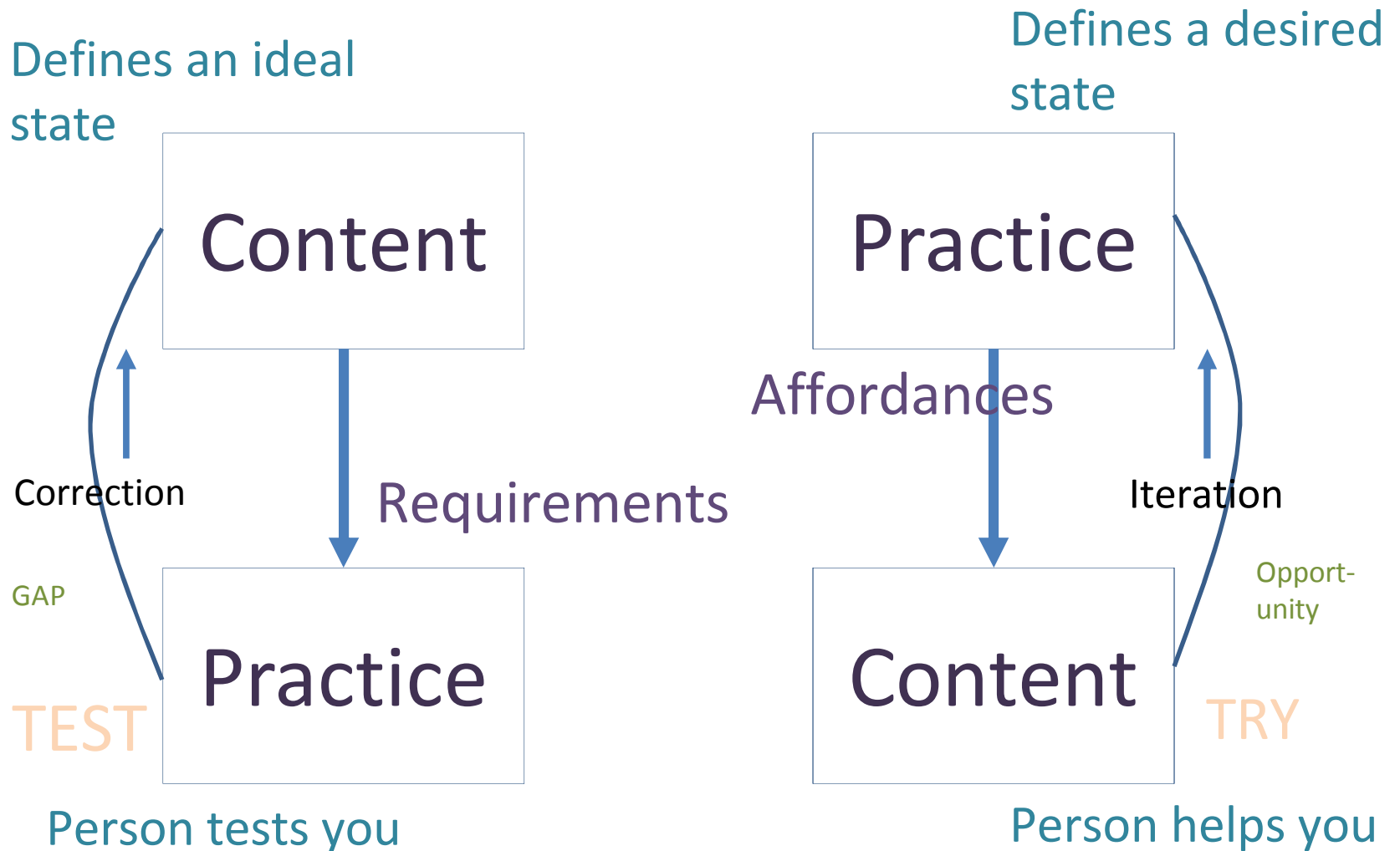
Defines an ideal state



Defines a desired state

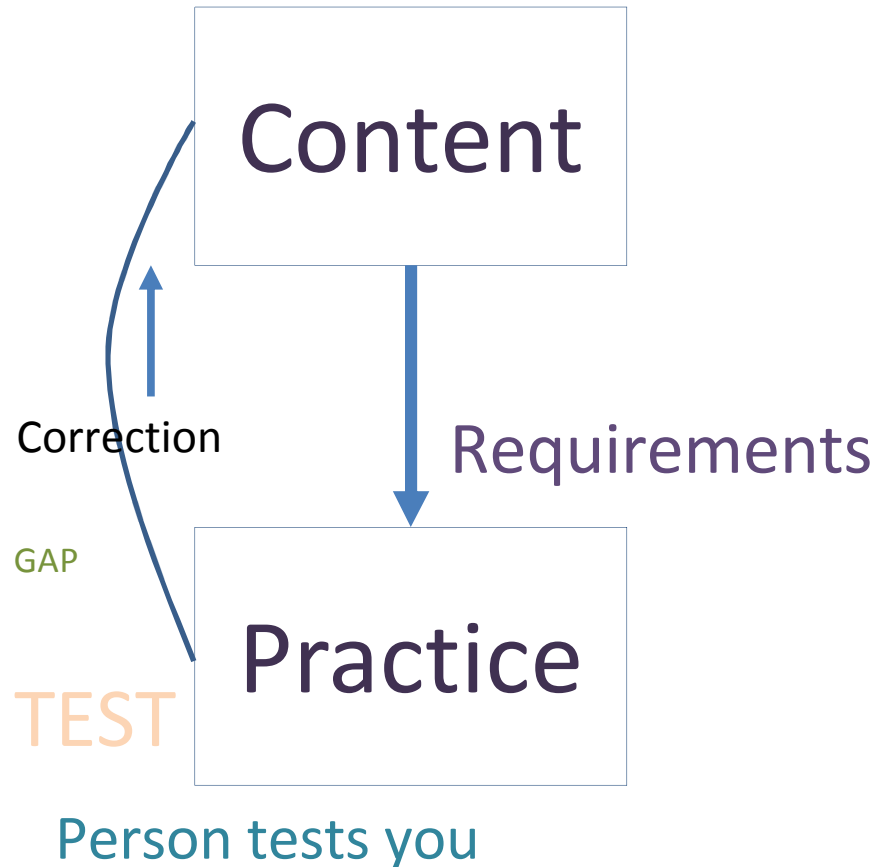


Design vs Environment

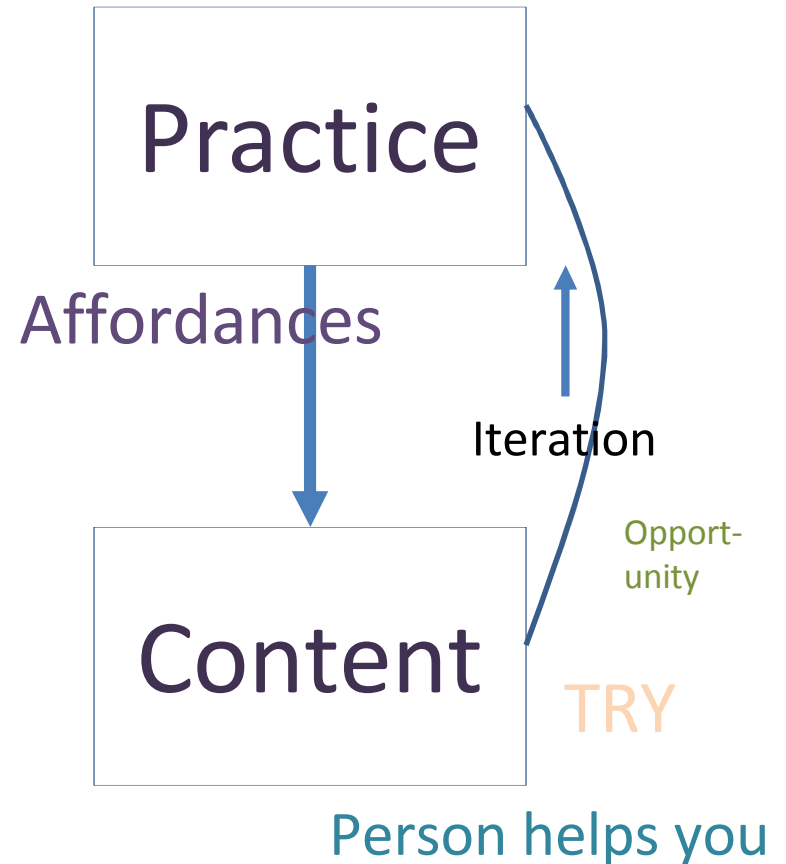


Design vs Environment

Personalized



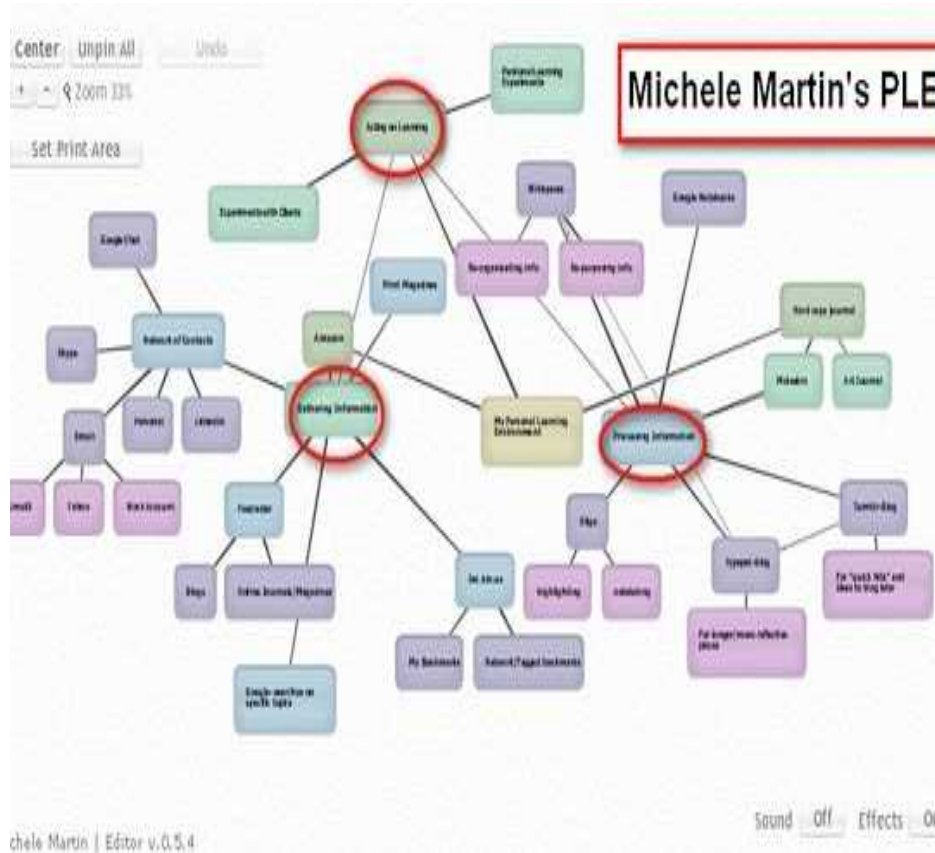
Personal



4. Personal Learning Environments

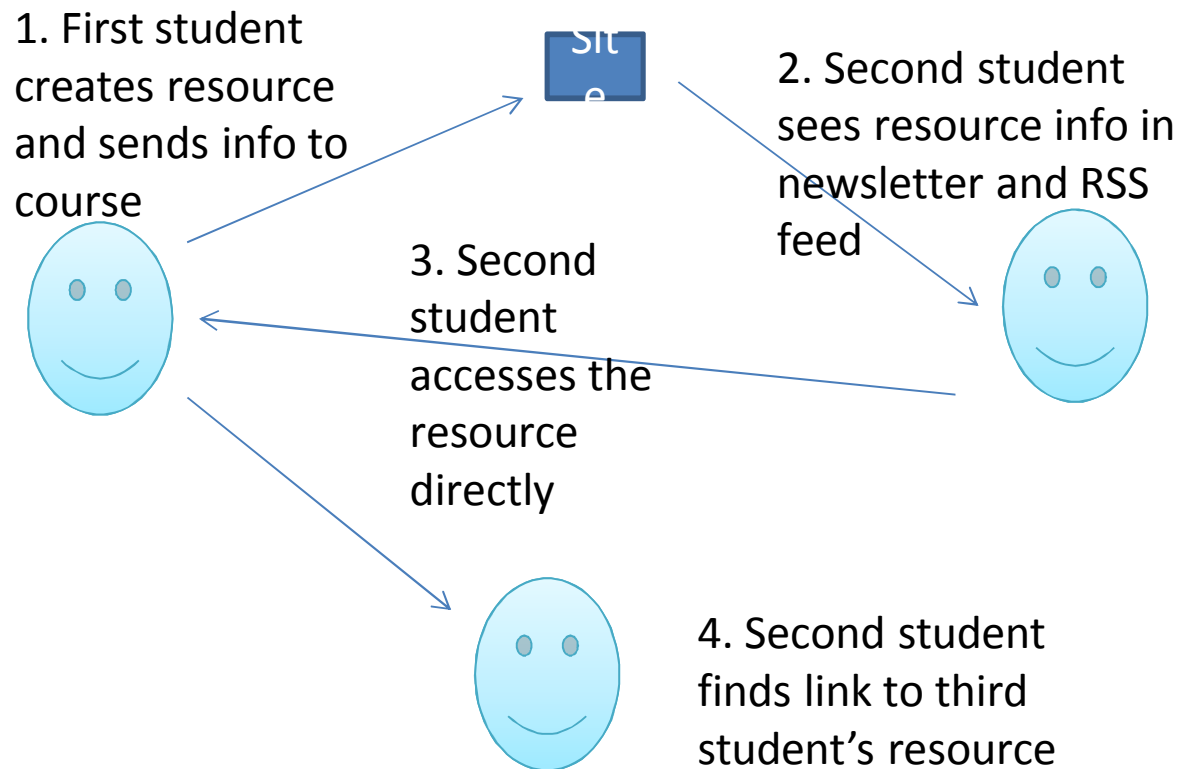


Personal Learning Environments

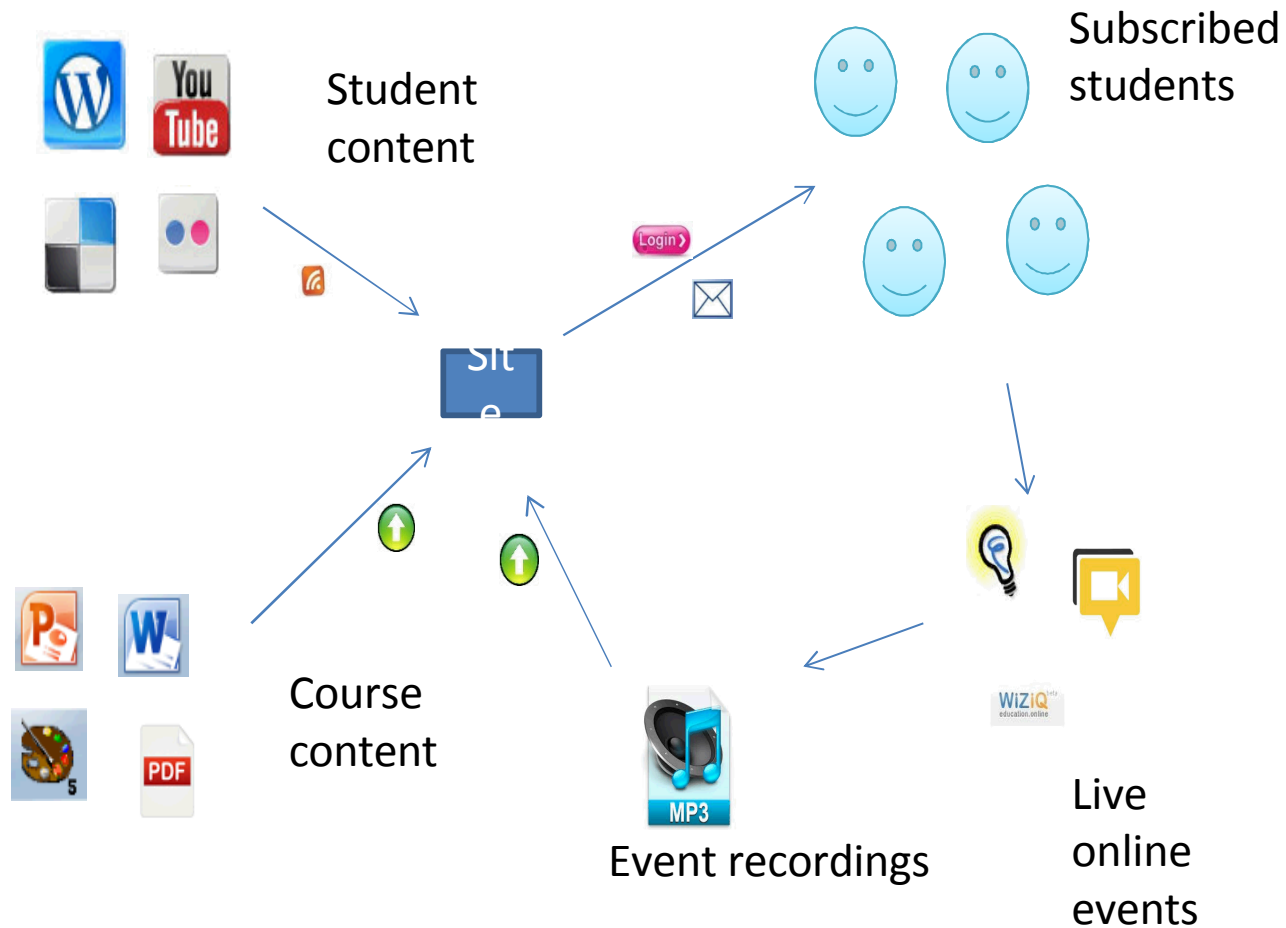


<http://dmlcentral.net/blog/howard-rheingold/diy-u-interview-anya-kamenetz>

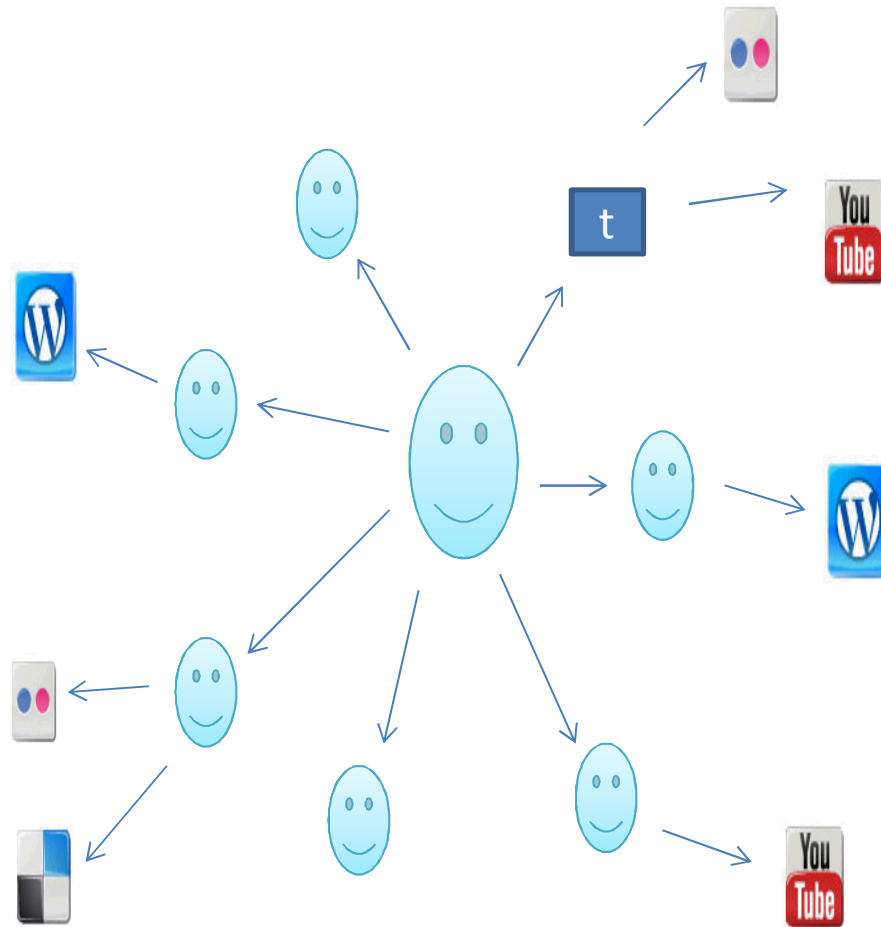
Underlying MOOC Support



Course Provider Perspective

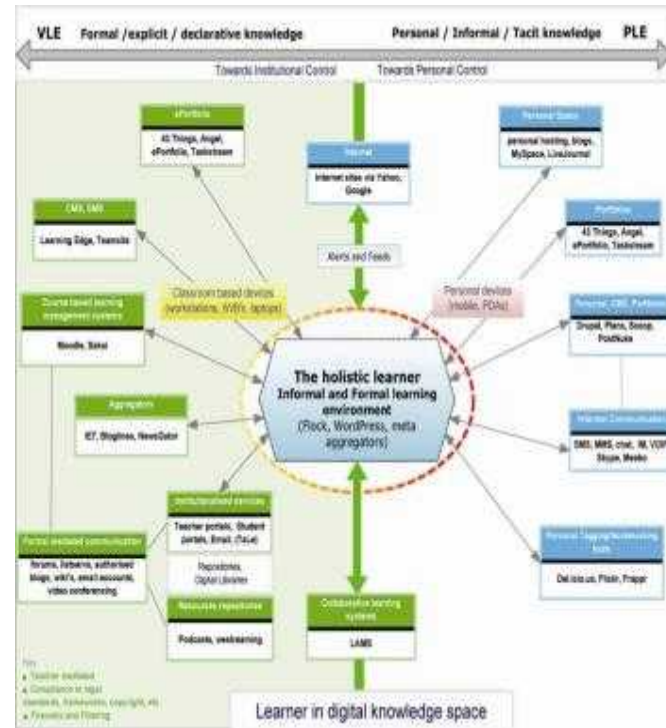
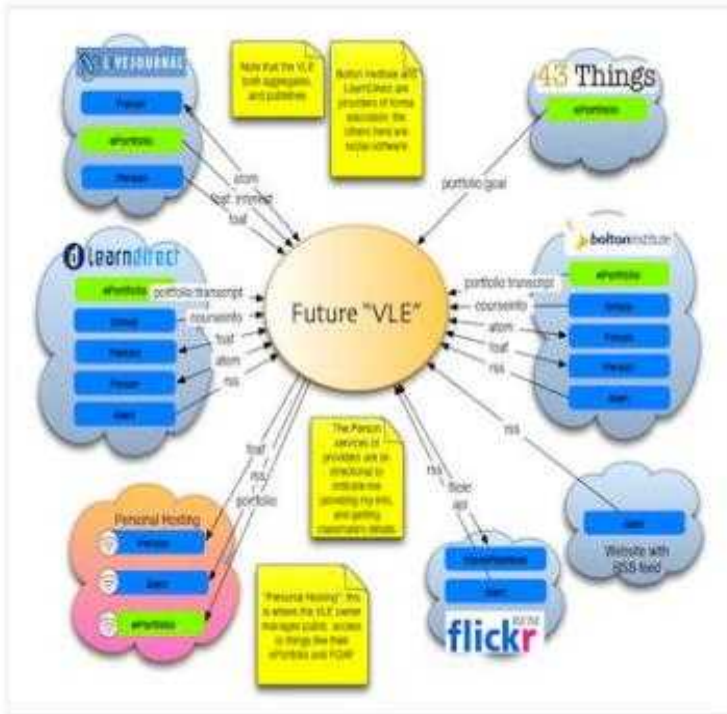


The Student's Perspective



A range of different resources and services

The design is based on putting
the learner at the centre



Scott Wilson (left), Tim Hand (right)

<https://www.google.com/search?q=ple+diagrams>

http://www.edtechpost.ca/ple_diagrams/index.php/mind-map-3

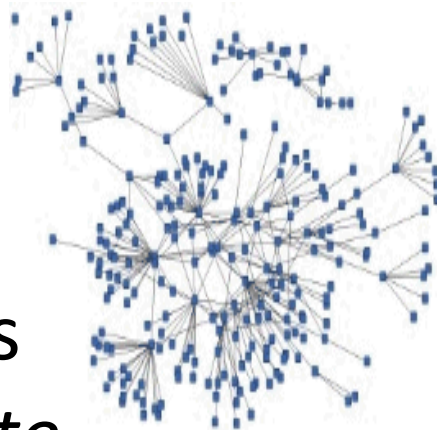
5. Learning and Performance Support Systems



LPSS is Built Around the Personal Learning Record

This is a *new* type of data – we call it the *personal graph*.

Each person has their own *private* personal graph.

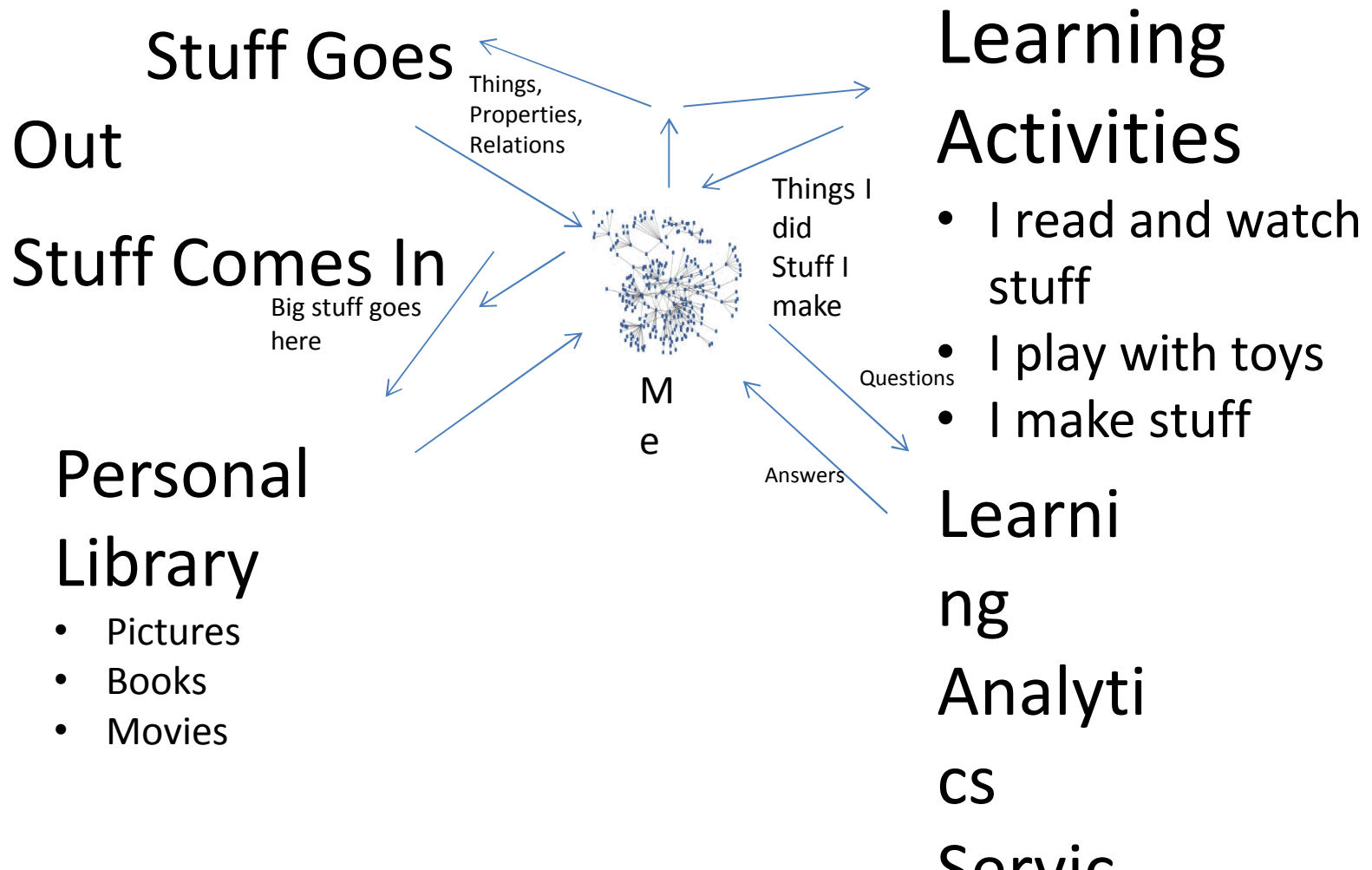


Me

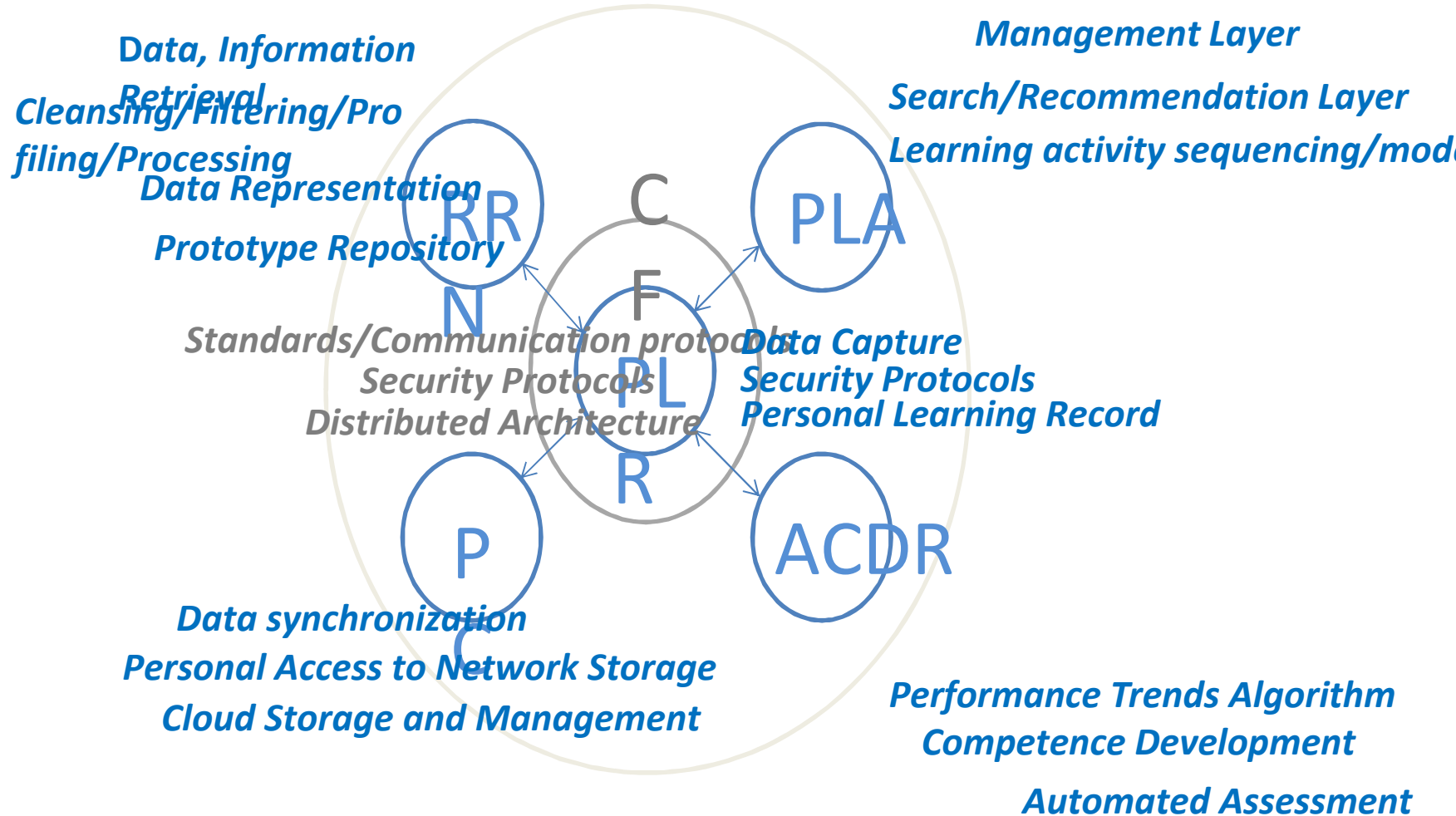
The PLR contains all a person's learning records, including:

- certificates, badges and credentials
- activity records, test results, scores
- Assignments, papers, drawings, things they create

LPSS is Built Around the Personal Learning Record



LPSS Details



Resource Repository Network (RRN)



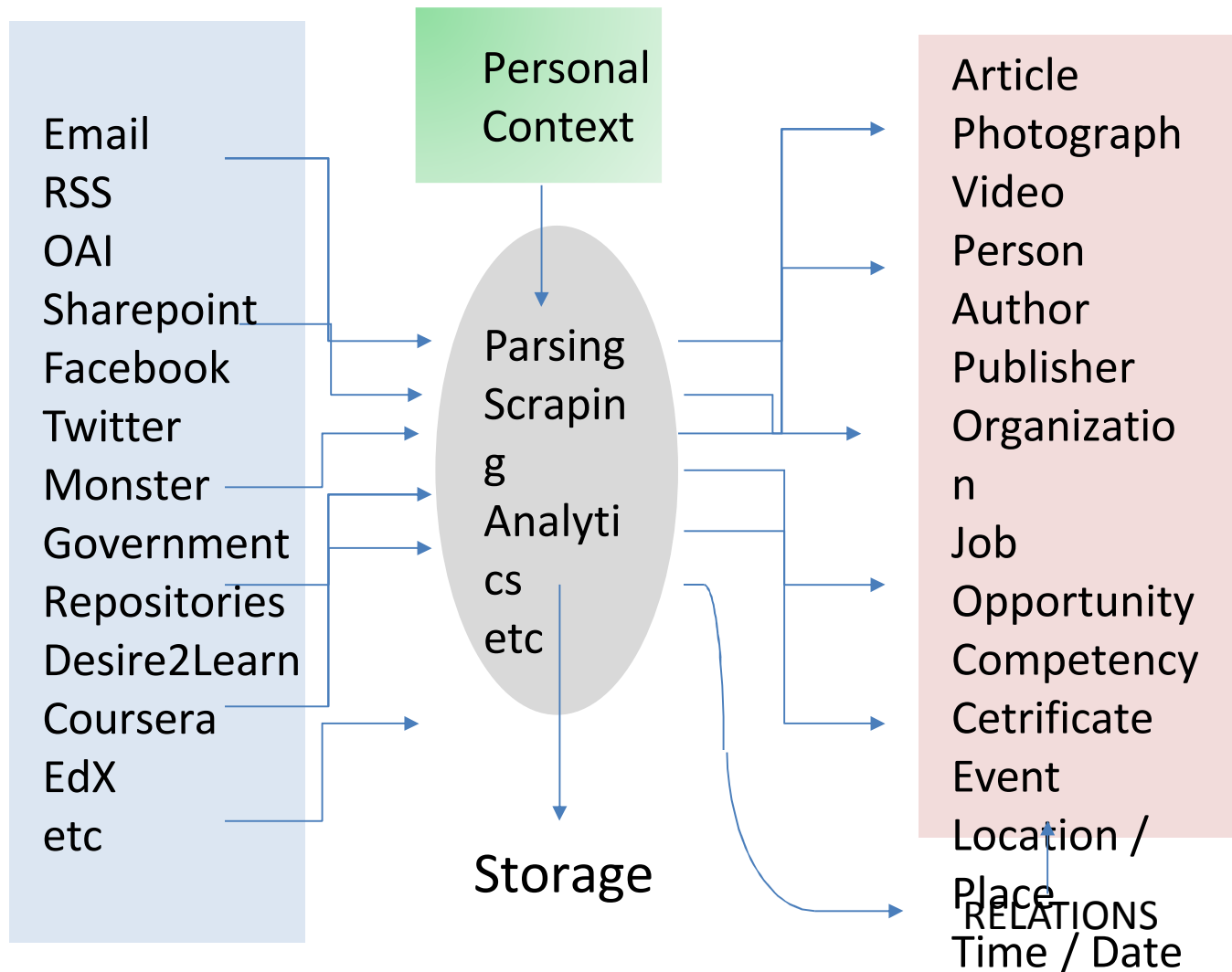
- Assemble resources from multiple locations

Resource Repository Network



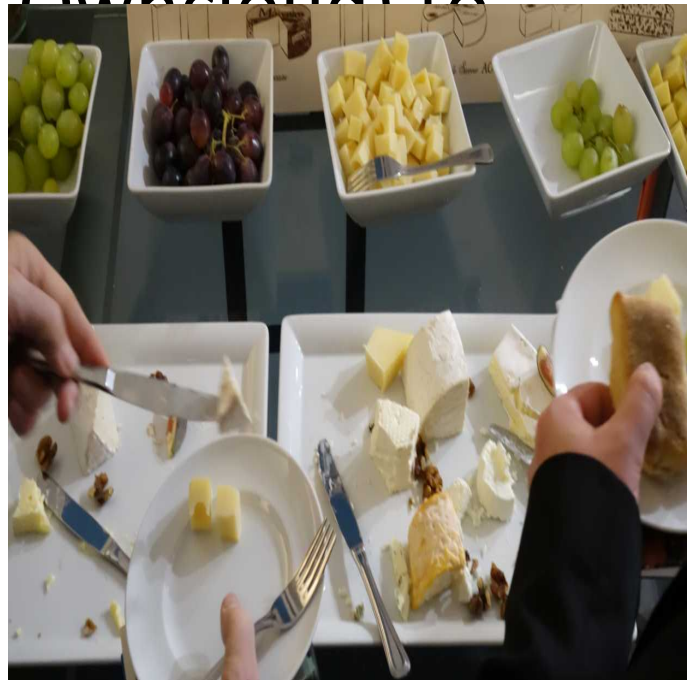
- Manage and discover list of sources and resources
- Maintain authentication and credentials
- Support APIs and metadata standards
- Gather, analyze and sort resources and/or metadata

RRN Aggregation and Storage

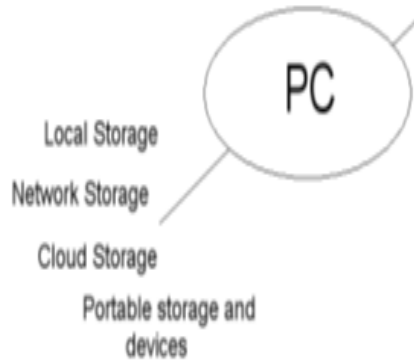


Personal Cloud

Synchronized cloud
data services
(including
Owncloud) to



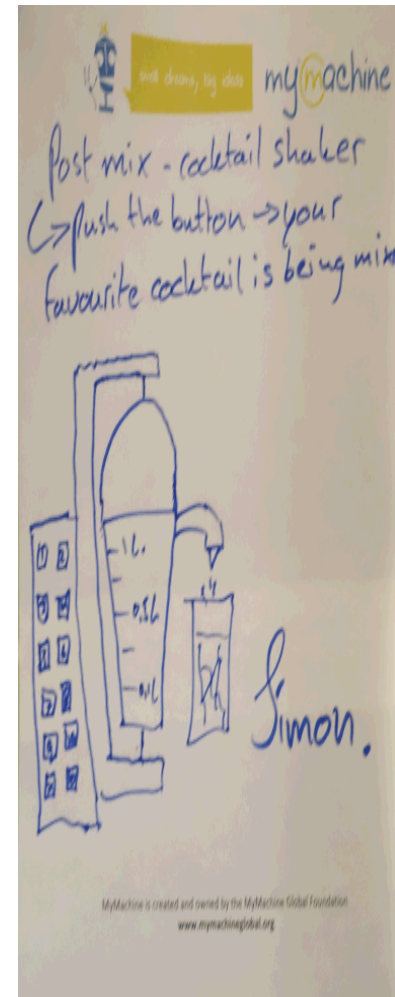
Personal Cloud



- Manage list of local and remote storage systems
- Maintain security, encryption, authentication and credentials
- Include local or personal device

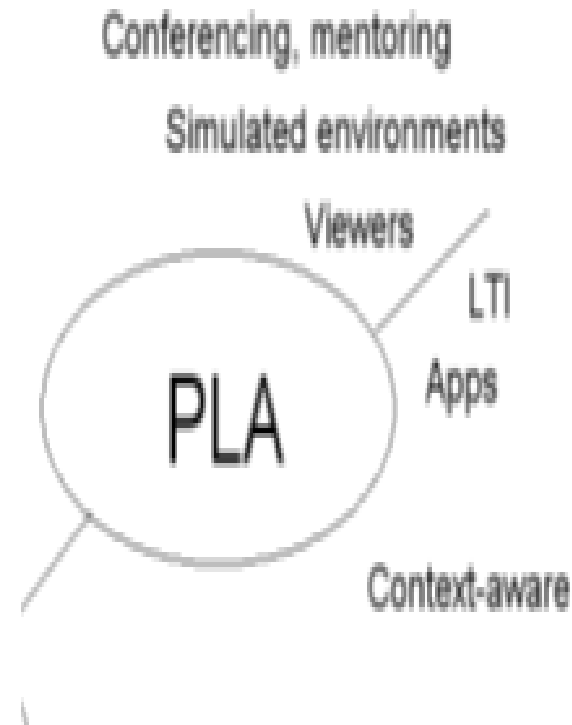
Personal Learning Assistant

Projection of learning services into multiple



Personal Learning Assistant

- Collect contextual information for system
- Display resources of various formats, including SCORM, LTI, etc.
- Support (scaffolded) authoring environments
- Project LPSS capacity into external software and devices

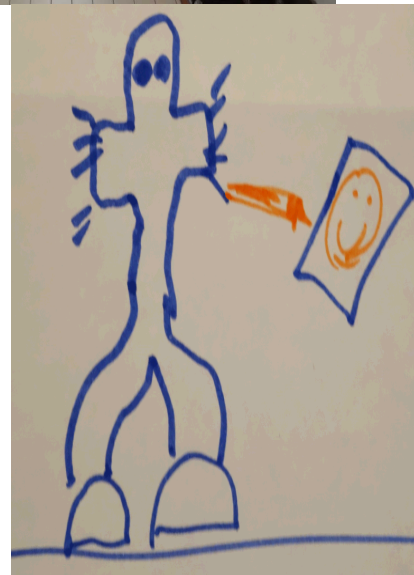
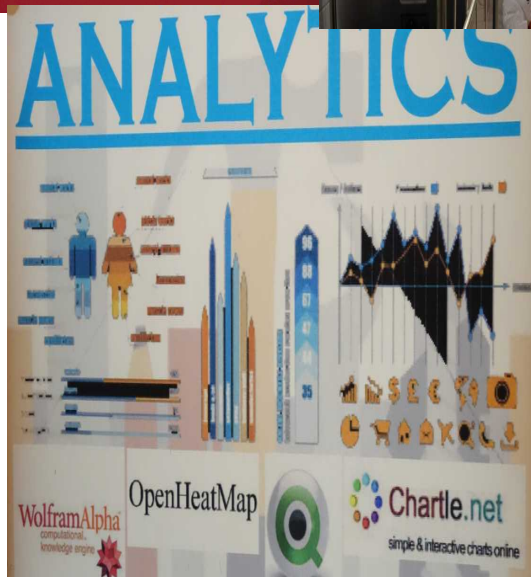


PLA: Collecting xAPI from Med Sims



https://www.flickr.com/photos/stephen_downes/15710336207/
<http://www.nrc-cnrc.gc.ca/eng/rd/medical/>

Automated Competency Recognition and Development



Automated Competency Recognition and Development

- Import or create competency definitions
- Analyze interactions for skills and learning gaps
- Support development of learning plans
- Provide resource and service recommendations



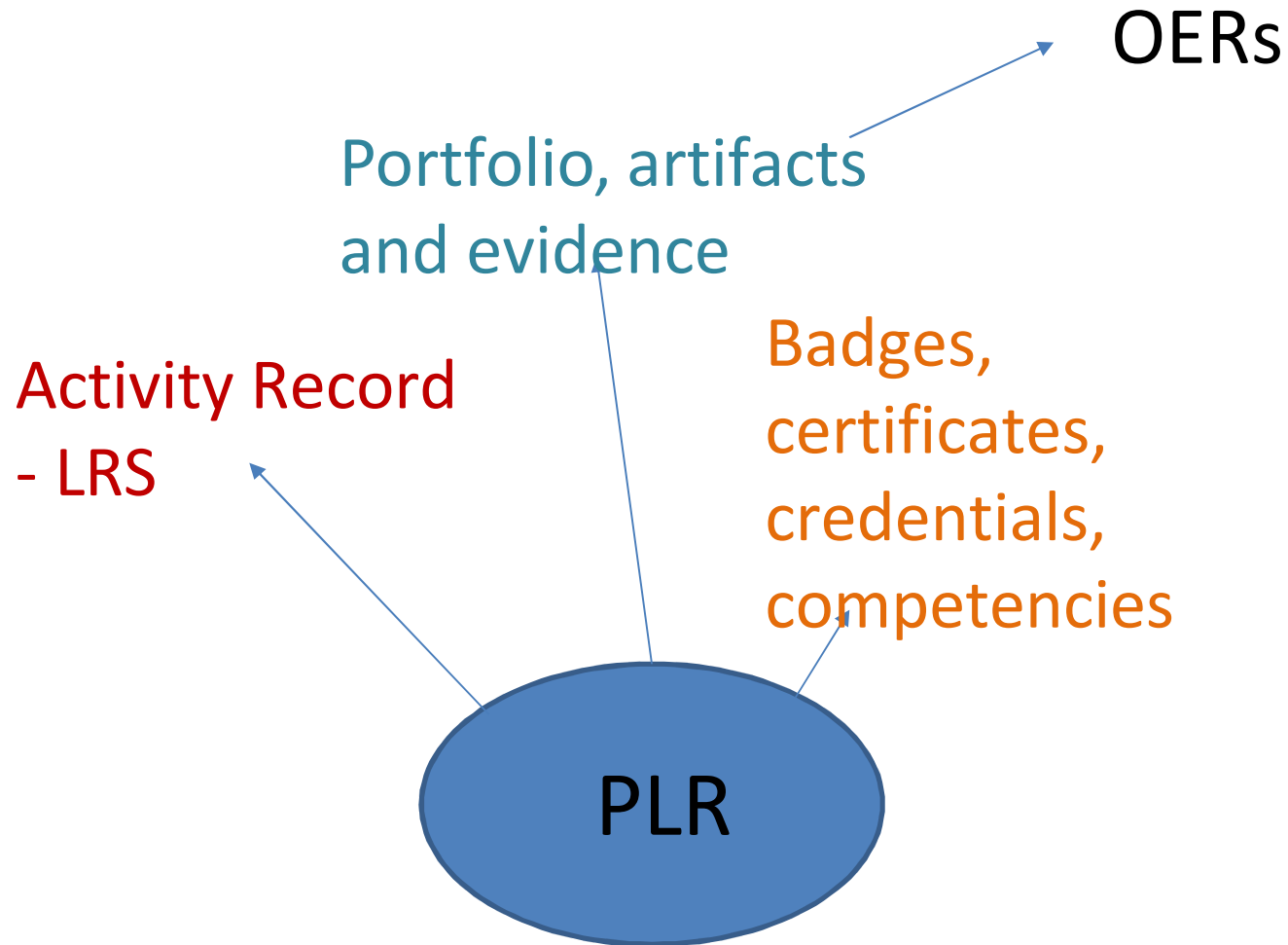
Personal Learning Record

The Personal Learning Record – data owned by the individual, shared only with permissions

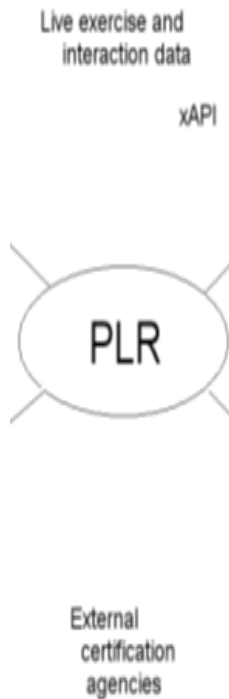


<http://halfanhour.blogspot.de/2014/12/eportfolios-and-badges-workshop-oeb14.html>

Personal Learning Record



Personal Learning Record



- Collect full record of interactions with all resources, external systems
- Support learning activity data exchange formats (eg. xAPI)
- Collect and present a person's personal portfolio
- Display certifications and credentials (eg. badges)
- Maintain 3rd party certification



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