

# Turning Learning into Numbers

## A Learning Analytics Framework



Graphic by Alex Guerten, 2008

Hendrik Drachsler & Wolfgang Greller  
Centre for Learning Sciences and Technologies (CELSTEC)

Open Universiteit



# Goals of the Presentation



LA Framework

Examples

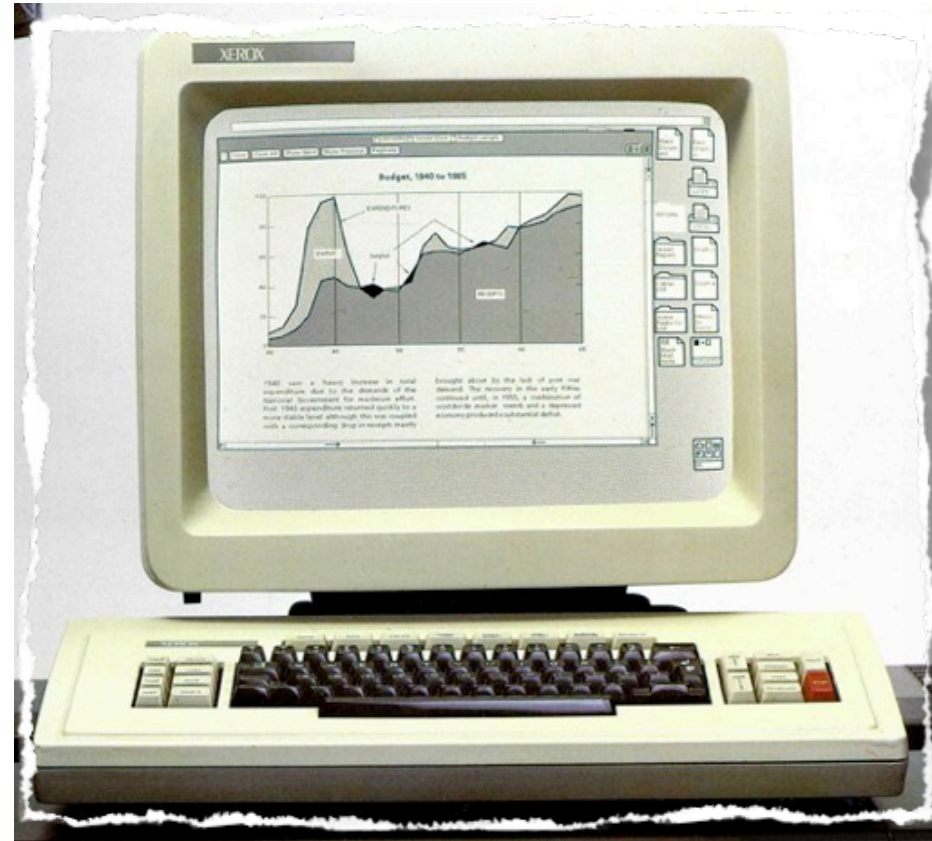
Data  
initiatives

Participation



# A view on Learning Analytics

## The Learning Analytics Framework



Greller, W., & Drachsler, H., (submitted). Turning Learning into Numbers. Toward a Generic Framework for Learning Analytics. Journal of Educational Technology & Society.



# Learning Analytics

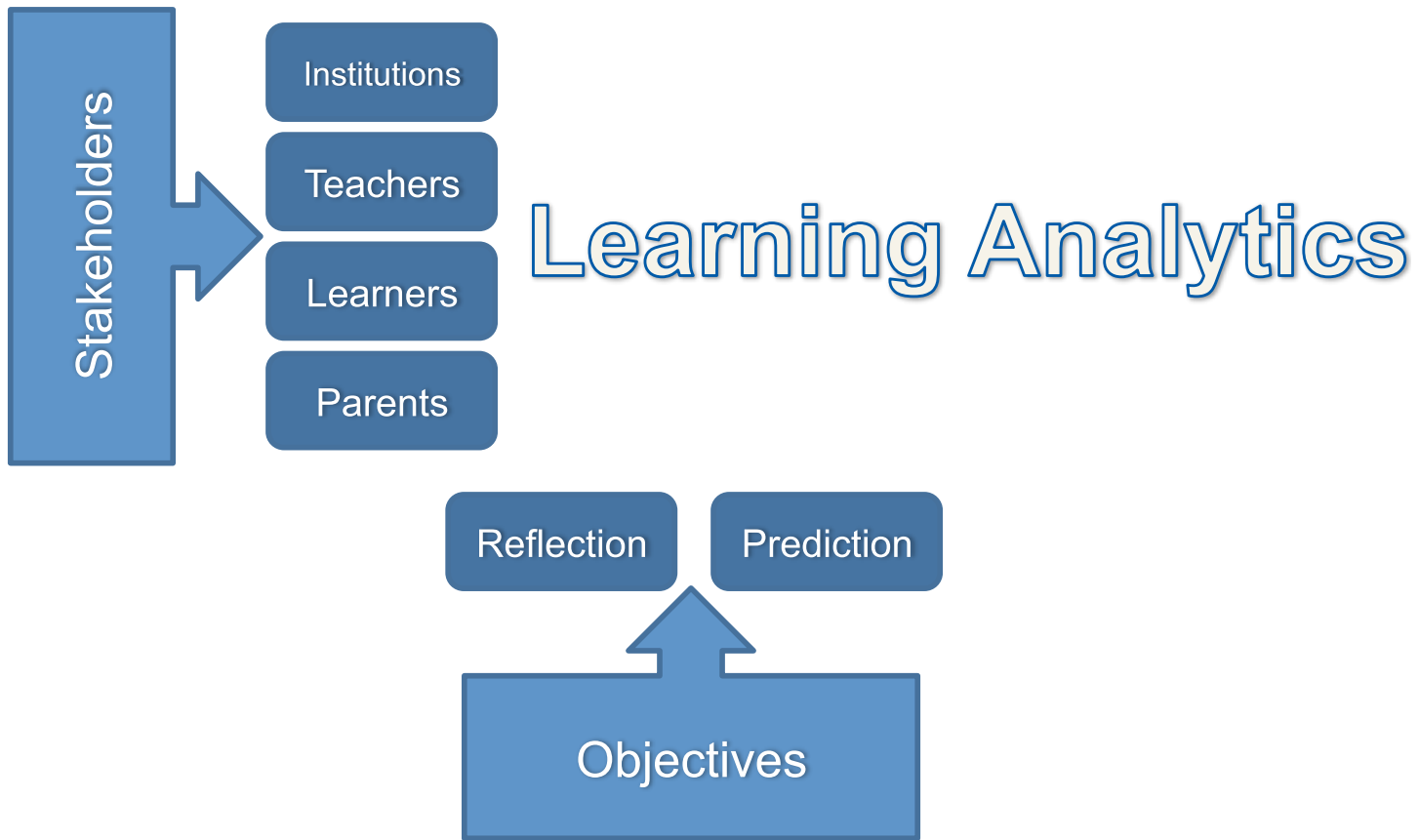


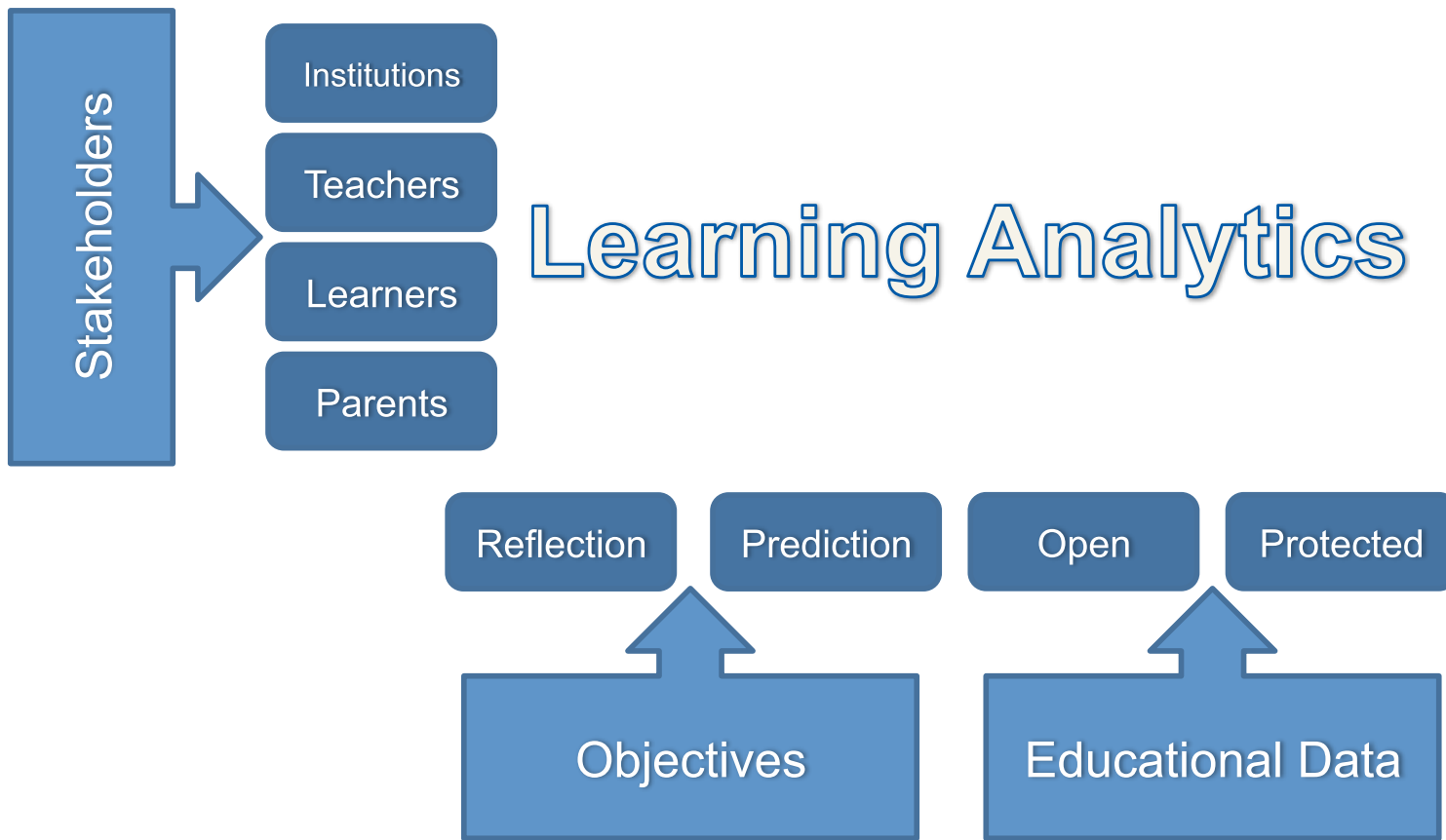
Stakeholders

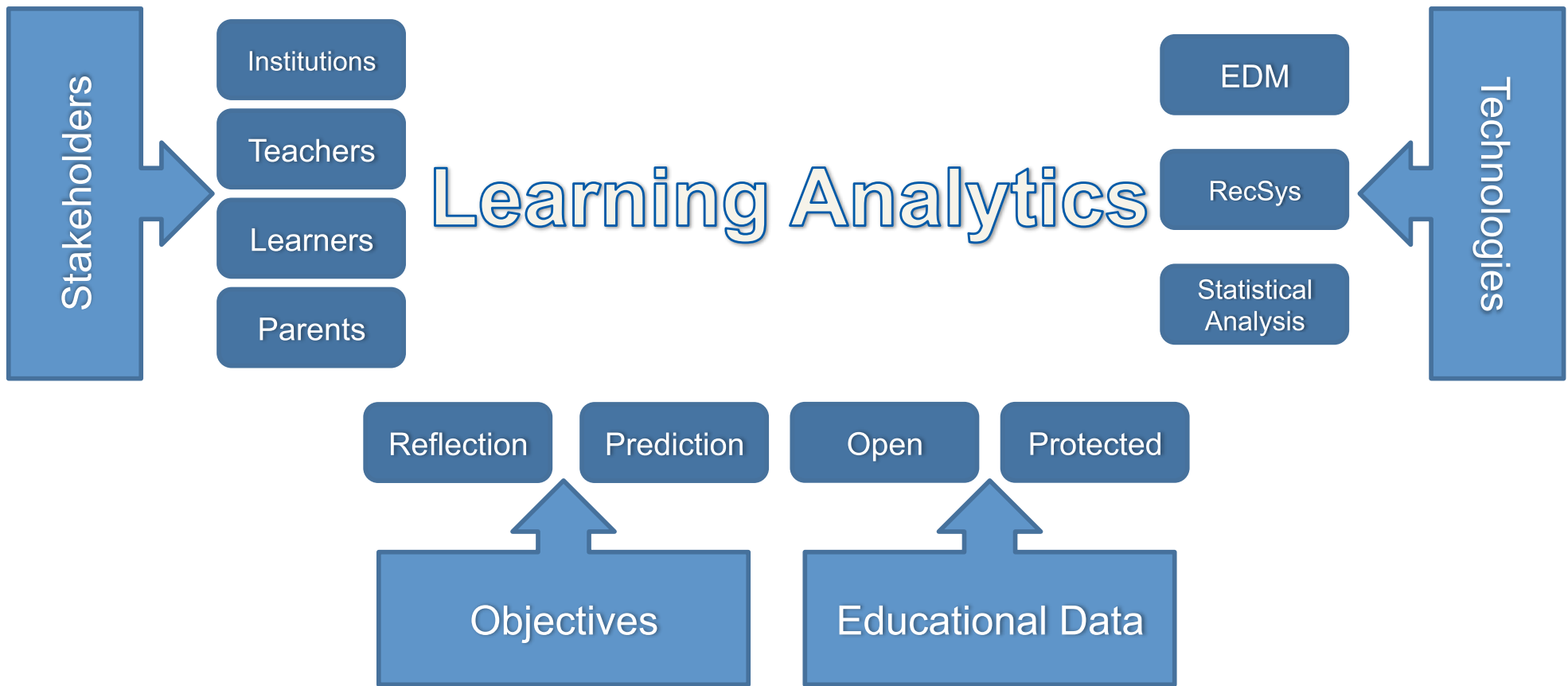


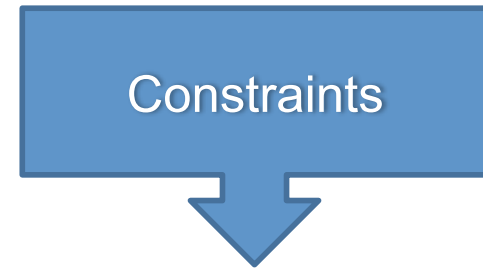
- Institutions
- Teachers
- Learners
- Parents

# Learning Analytics

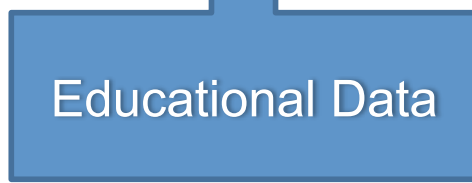
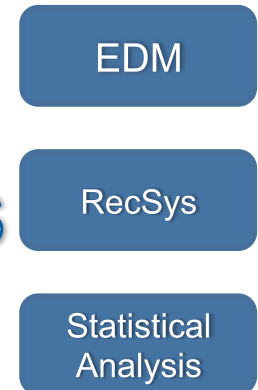




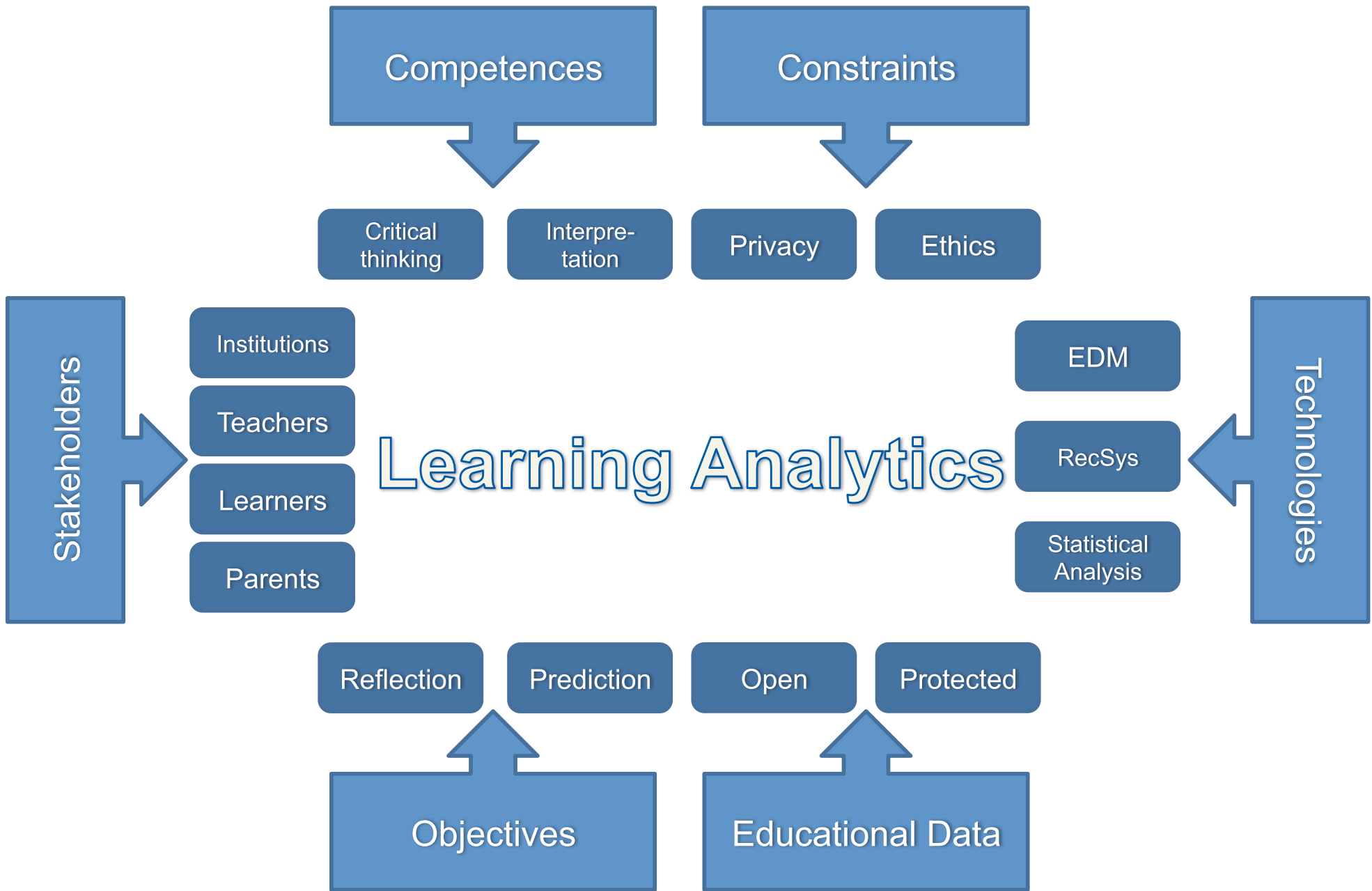




# Learning Analytics

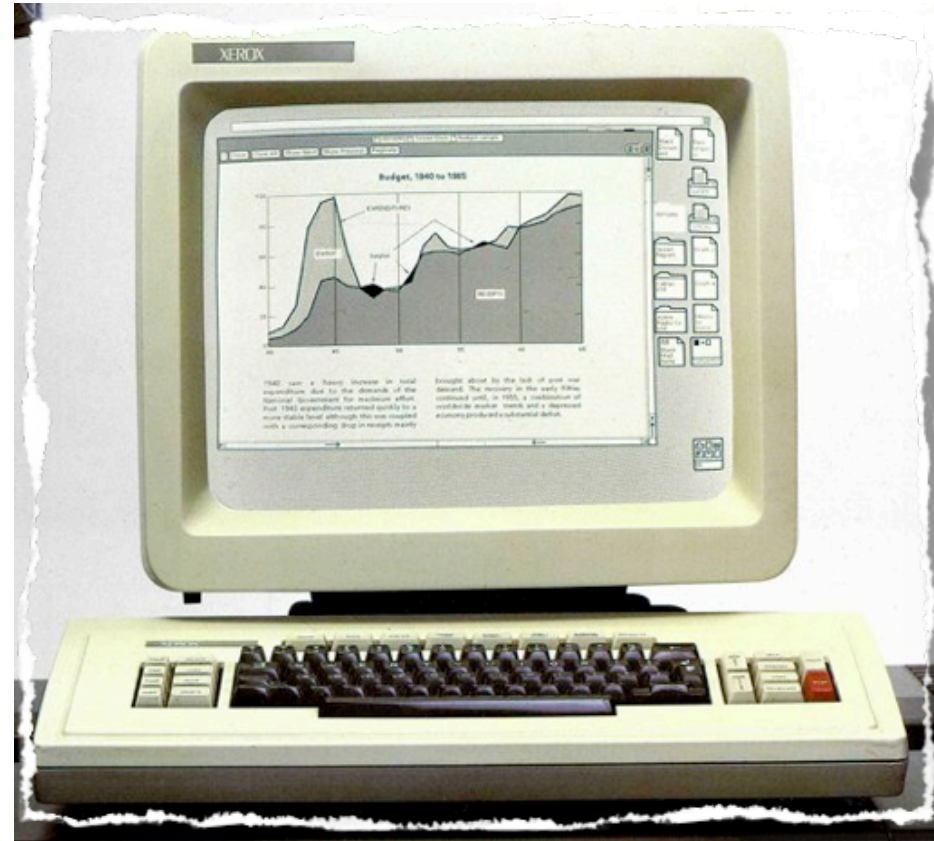


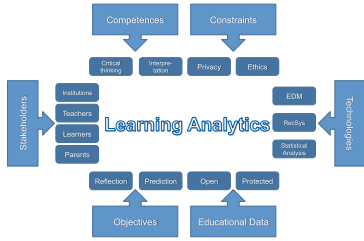




# Zooming into the Framework

Practical  
examples for  
application  
and use

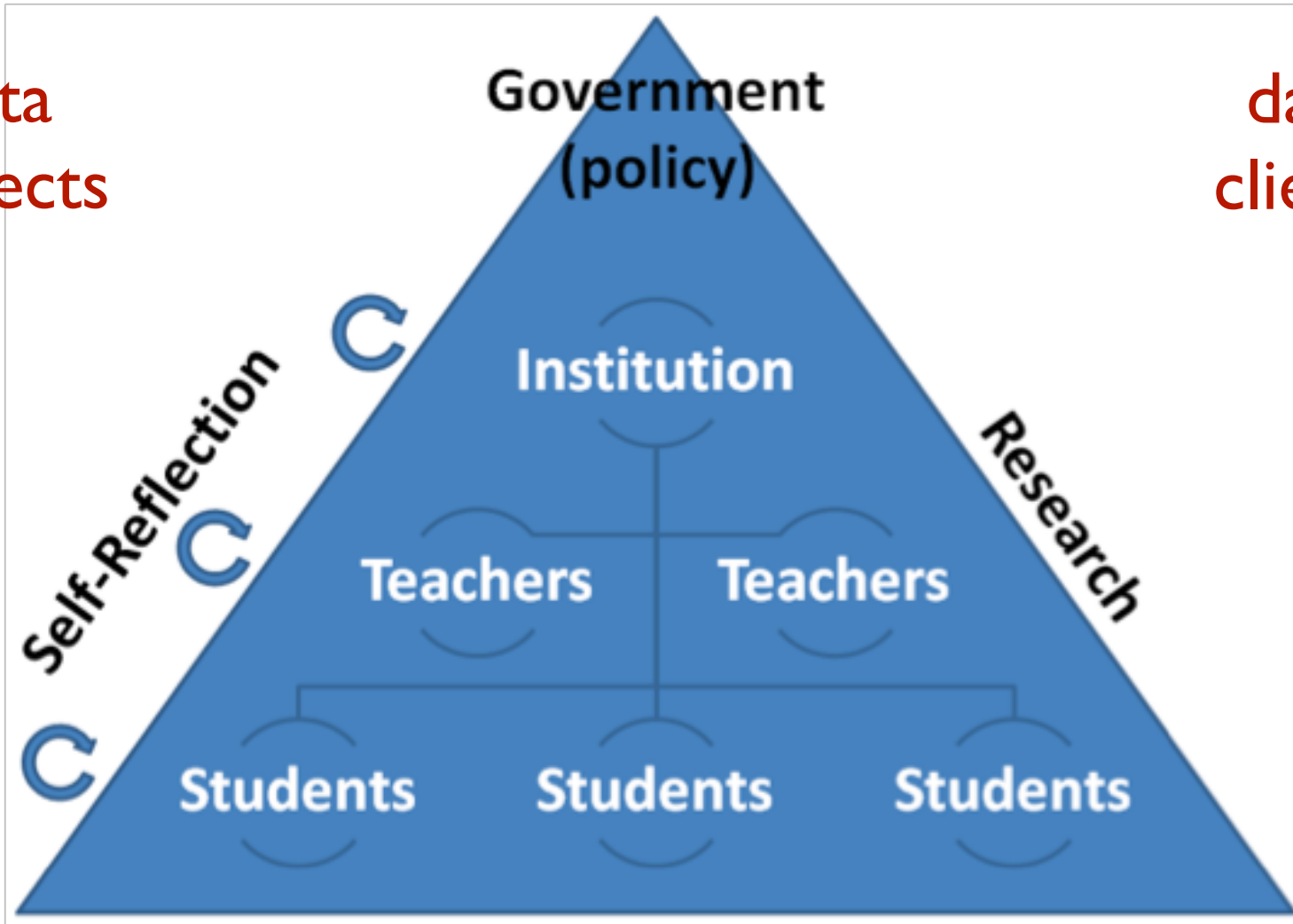


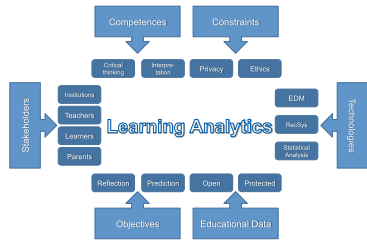


# Stakeholders

data  
subjects

data  
clients





# Objectives

## Reflection

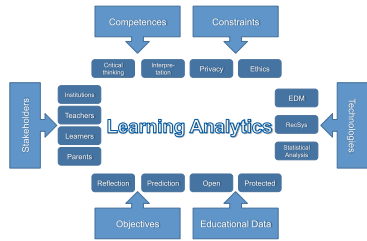


(a) underperforming this week



(b) most active this week

(Glahn, 2009)



# Objectives

## Reflection



(a) underperforming this week



(b) most active this week

**ReScope Tags** [help]

ajax ambientcomputing analysis **art** artist audio austria backup  
 barcelona **blog** call christmas **coding** comic competence  
 computergames computerscience conferences contemporary creative  
 critique **culture** database **design** dictionaries dutch **education**  
 cleaning email eu example fantasy **flash** framework friends fun  
 futuretechnologies **gamebasedlearning** gaming general google graffiti  
 graphicdesign gui **hardware** hci history ideas identity illustration  
 indicators informal infrastructure innovation instantmessaging interactive  
 java javascript **journals** landat **learningtechnology** library light  
**linux** literature ll la mace macosx management maps  
 microblogging mmerp **mobile** mobilelearning modeling movies  
 multimedia museum music networking **osrs** oll oer  
**opensource** optimization papette performance **perl** personal  
 personalisation philosophy photos policy project project-management  
 projects publication r reflection **research** ria science semanticweb  
 server shonnie simulation sna socialeffects **socialsoftware**  
 society **software** softwarearchitecture specifications **ssi** statistics steel  
 streetart study svg **system** tagging teaching technology telephony  
 theory **tools** toys train training travel tv uml usability versioning  
 video virtualmuseum visualisation vop weather **web** **web2.0**  
**webapplications** webdesign wi wiki wikis windows work **wp**  
 xml youth

**Christian Glahn**  
 Your Profile  
 ReScope Tags

**How are you reading your tag cloud? [help]**  
 Write down your thoughts about your tags and return to them later. Use **hash-tags** to label important bits, such as goals, tasks, or topics.

**140**

Reset To Current Tag Cloud .....

**Previous notes**  
 Below are your previous notes. By clicking on one of them you gain also access to your tag cloud at the time while you were taking the notes.

A note while demonstrating to wim  
 17.12.2008 14:29:04

XXX  
 05.12.2008 00:24:03

Another showcase  
 25.11.2008 20:05:36

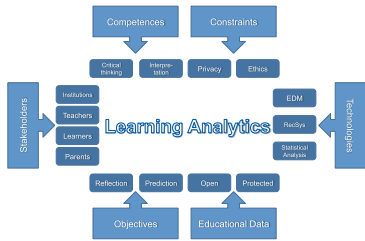
fresh bookmarks make quite some changes with my cloud - #blogs are more important now.  
 02.10.2008 09:58:19

Hallo Wolf  
 24.09.2008 16:23:59

This is the #tag #cloud at the start of the #experiment I  
 24.09.2008 02:35:42

(Glahn, 2009)





# Objectives

## Reflection



(a) underperforming this week



(b) most active this week

## Prediction



**ReScope Tags** [help]

ajax ambientcomputing analysis art artist audio austria backup barcelona blog call christmas coding comic competence computergames computerscience conferences contemporary creative critique culture database design dictionaries dutch education elearning email eu example fantasy flash framework friends fun futuretechnologies gamebasedlearning gaming general google graffiti graphicdesign gui hardware hci history ideas identity illustration indicators informal infrastructure innovation instantmessaging interactive java javascript journals landat learningtechnology library light linux literature ll la maze macosx management maps microblogging mmerp mobile mobilelearning modeling movies multimedia museum music networking zseries xl oer

**opensource** optimization papertes performance perl personal personalisation philosophy photos policy project project-management projects publication r reflection **research** ria science semanticweb server shonmovie simulation sna socialeffects socialsoftware society software softwarearchitecture specifications ssi statistics steel streetart study svg system tagging teaching technology telephony theory **tools** toys train training travel tv uml usability versioning video virtualmuseum visualisation vop weather web web2.0 webapplications webdesign wi wiki wikis windows work xsl xml youth

**Christian Glahn**  
Your Profile  
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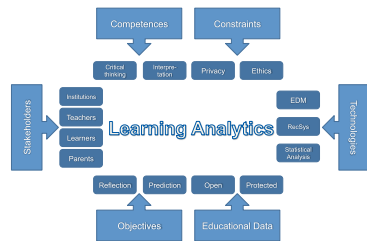
This is the #tag #cloud at the start of the #experiment I  
24.09.2008 02:35:42

**Customer Reviews**

**Average Customer Rating**  
★★★★☆ (213 customer reviews)

5 star:		(153)	<a href="#">Appearance</a> .....	★★★★★ (277)
4 star:		(38)	<a href="#">Portability</a> .....	★★★★★ (270)
3 star:		(10)	<a href="#">Bluetooth compatibility</a> .....	★★★★★ (265)
2 star:		(8)	<a href="#">Battery life</a> .....	★★★★★ (244)
1 star:		(4)	<a href="#">See and rate all 6 attributes.</a>	

(Glahn, 2009)



# Educational Data

**RecSysTEL 2010**  
**Workshop on Recommender Systems for Technology Enhanced Learning**

Organised jointly by  
 4th ACM Conference on Recommender Systems (RecSys 2010)  
 5th European Conference on Technology Enhanced Learning (EC-TEL 2010)

Barcelona, Spain, 29-30 September 2010

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Home Page

Aims and Scope  
 Workshop history

Topics

Important Information  
 Submissions  
 Datatel Challenge  
 Important Dates  
 Accepted Papers

Workshop Information  
 Location  
 Detailed Program  
 Registration

Committees  
 Workshop Chairs  
 Steering Committee

Notifications to authors already sent.  
 Camera-ready versions have to be received by August 15, 2010

**Submission for DataTEL challenge: August 31st, 2010 \*\*\*EXTENDED\*\*\***

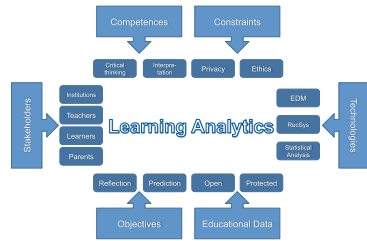
1st Workshop on Recommender Systems for Technology Enhanced Learning (RecSysTEL 2010)

In conjunction with

4th ACM Conference on Recommender Systems (RecSys 2010)  
 5th European Conference on Technology Enhanced Learning (EC-TEL 2010)

Barcelona, Spain, 29-30 September 2010

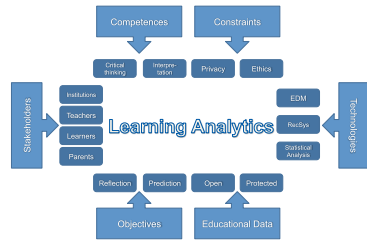
Verbert, K., Manouselis, N., Drachsler, H., and Duval, E. (submitted). Dataset-driven Research to Support Learning and Knowledge Analytics. *Journal of Educational Technology & Society*.



# Educational Data

	Mendeley	APOSDLE	ReMashed	Organic .edunet	Mace	Melt
Collection period	1 year	3 months	2 years	9 months	3 years	6 months
Users	200.000	6	140	1.000	1.148	98
Items	1.857.912	163	96.000	11.000	12.000	1.923
Activities	4.848.725	1.500	23.264	920	461.982	16.353
reads	+	+	-	-	+	-
tags	+	(+)	+	+	+	+
ratings	(+)	-	+	+	+	+
downloads	+	+	-	-	+	+

Drachsler, H., et al. (2010). Issues and Considerations regarding Sharable Data Sets for Recommender Systems in Technology Enhanced Learning. 1st Workshop Recommnder Verbert, K., Manouselis, N., Drachsler, H., and Duval,E. (submitted).Dataset-driven Research to Support Learning and Knowledge Analytics. Journal of Educational Technology & Society.



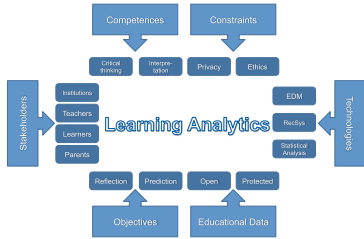
# Educational Data

		dataTEL											PSLC DataShop					Mulce				
		Mendeley	MERLOT	APOSDLE	ReMashed	Organic.edunet	MACE	Travel well	ROLE	SidWeb	U3CM	CGIAR	L <sup>2</sup> P	Algebra 2008-2009	Bridge to Algebra	Geometry area	Electric Fields - Pitt	China Vocabulary	Handwriting2/Example	VMT	mce-simu	eurocall05
<b>action type</b>	attempt			+						+	+		+	+	+	+	+	+				
	create/delete			+				+	+	+	+						+					
	write/edit			+						+	+											
	select/unselect	+		+			+	+	+	+	+											
	search			+			+	+	+	+	+											
	send/receive			+				+	+			+								+	+	+
	register			+								+										
	open/close			+					+		+	+										
	add/remove											+										

Verbert, K., Manouselis, N., Drachsler, H., and Duval, E. (submitted). Dataset-driven Research to Support Learning and Knowledge Analytics. *Journal of Educational Technology & Society*.

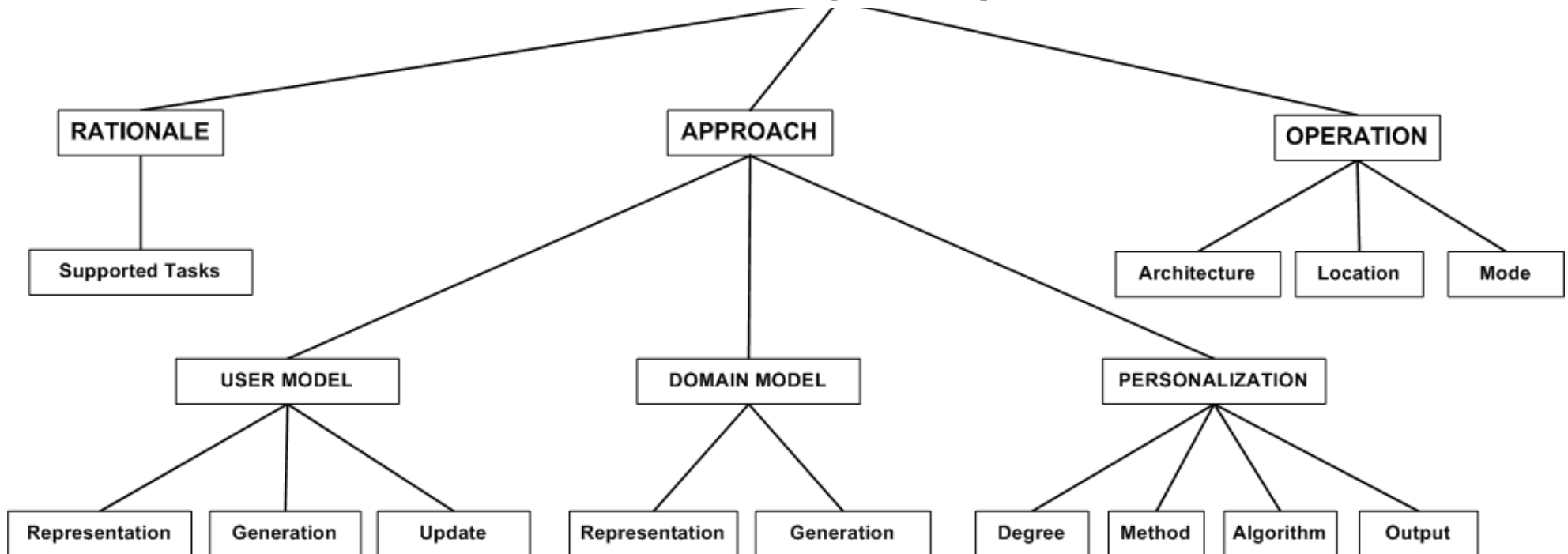




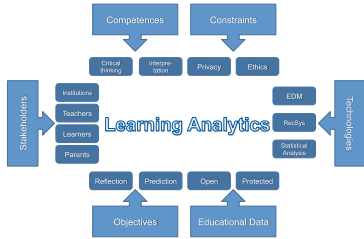


# Technologies

## Learning Analytics

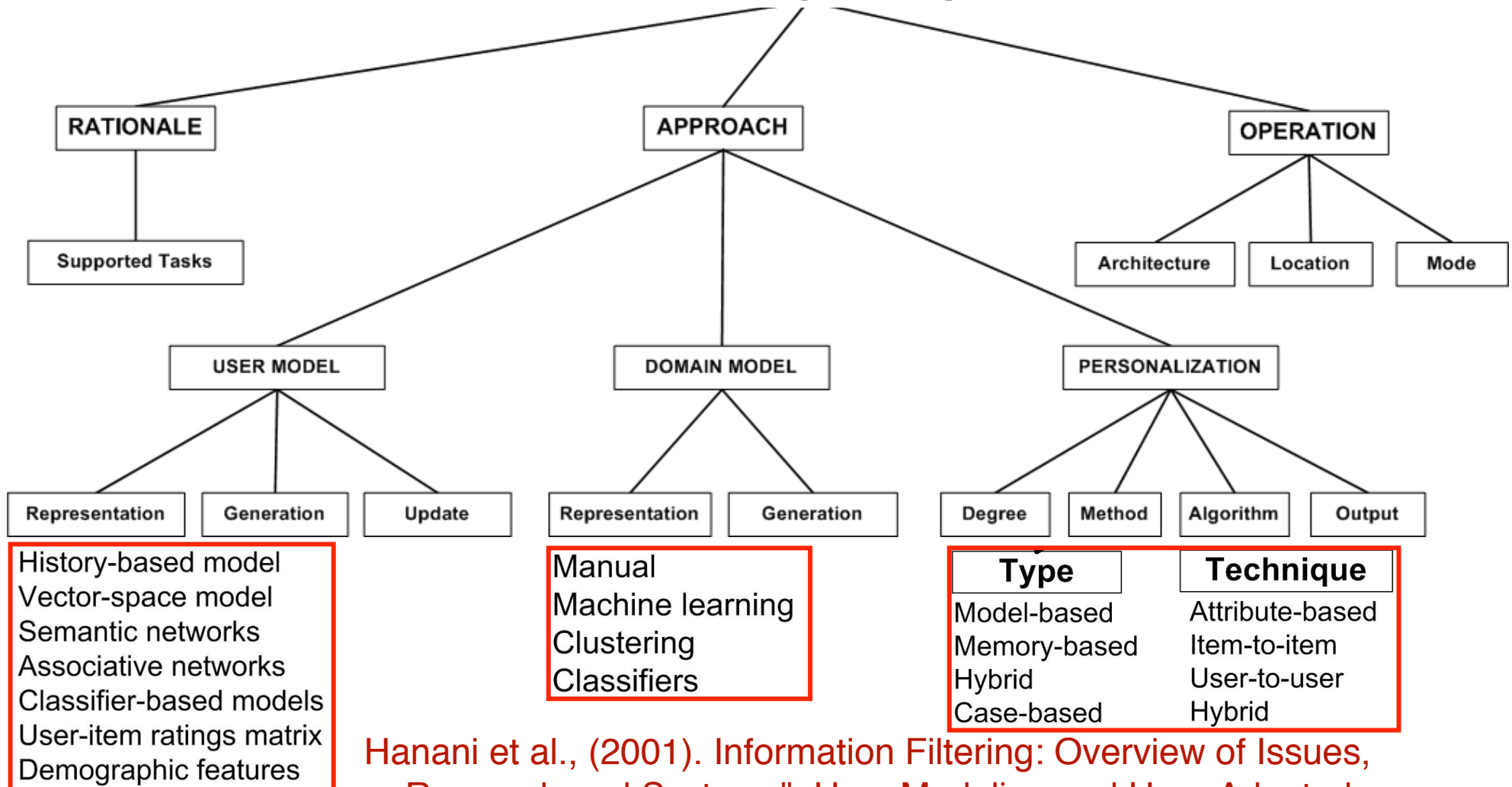


Hanani et al., (2001). Information Filtering: Overview of Issues, Research and Systems", User Modeling and User-Adapted Interaction, 11, 2001 9

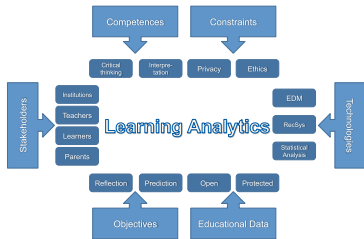


# Technologies

## Learning Analytics



Hanani et al., (2001). Information Filtering: Overview of Issues, Research and Systems", User Modeling and User-Adapted Interaction, 11, 2001 9



# Technologies

## Prediction

Signed in as hendnk.drachsler@ou.nl | Home | Change settings | Sign out

### DELICIOUS

posted by nogmaareentest@test.nl on May 26, 2009 2:11:25 PM  
**Get More Twitter Followers! - FeaturedUsers.com**  
 Costs, but might be worth considering in the future if things really take off with Twitter  
 twitter tool network  
 ☆☆☆☆☆

posted by test5@test.be on May 26, 2009 2:10:20 PM  
**FIRE SAFETY TRAINING AT WORK & AT HOME**  
 Fire safety  
 ☆☆☆☆☆

posted by teletubbie@bnn.nl on May 26, 2009 11:14:23 AM  
**Ask SM: CSS Quick-Question Edition | CSS | Smashing Magazine**  
 css Tips webdevelopment tutorials  
 ☆☆☆☆☆

posted by nogmaareentest@test.nl on May 26, 2009 11:11:30 AM  
**The Science Creative Quarterly » ON KINGDOMS AND THE GALAPAGOS ISLANDS: A TREATISE ON DARWIN'S CONTRIBUTIONS TO MODERN ECOLOGY AND EVOLUTION IN CALIFORNIA**  
 ☆☆☆☆☆

previous items

### FLICKR

england kent dover templewell jelltex jelltecks  
 ianhadingham  
 ☆☆☆☆☆

### BLOG

posted by test2@test.com on May 22, 2009 2:10:46 AM  
**Digital Campus #42 - The Real World**  
 This week's podcast looks at the fake, the real, the copies, and the bizarre: fake journals from Elsevier, the MPAA telling teachers to film their TVs, the University of Michigan asking for real uses for its copies of Google's book...  
 ☆☆☆☆☆

posted by test2@test.com on May 15, 2009 4:21:51 AM  
**Zotero 2.0 Is Here!**  
 After an extensive development and testing period and the addition of even more features to make academic research easier, more collaborative, and ready for the future, Zotero 2.0 went public tonight. I'll be blogging extensively about...  
 ☆☆☆☆☆

posted by test2@test.com on May 13, 2009 2:01:37 AM  
**Idealism and Pragmatism in the Free Culture Movement**  
 [A review of Gary Hall's Digitize This Book! The Politics of New Media, or Why We Need Open Access Now (University of Minnesota Press, 2009). Appeared in the May/June 2009 issue of Museum.] Beginning in...  
 ☆☆☆☆☆

previous items

### SLIDESHARE


posted by teletubbie@bnn.nl on May 22, 2009 6:58:09 AM  
**Naming A Business, Product Or Service**  
 Keeping a Business name, name of...

### BEST RATED ITEMS OF THE WEEK

#### BLOG

posted by test@test.com on Mar 6, 2009 10:12:39 AM  
**ReMashed evaluation week 3**  
 This time we decided to offer a qualitative evaluation of the ReMashed system. Therefore, we ask the contributor of the week Dr. Wolfgang Greller (best rated item in cat.: bookmark, picture and blog posting) for a short interview regarding his...  
 ReMashed interview greller recommender experiment emergence

#### SLIDESHARE

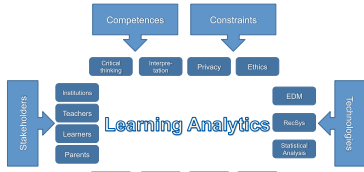
posted by teletubbie@bnn.nl on May 12, 2009 1:39:05 PM  
**Innovation**  

 What is Innovation, Why is it important and lots more covered in this 101 on Innovation  
 innovation ideas property sciencetechnology commercialize

#### YOUTUBE

posted by hendrik.drachsler@ou.nl on May 12, 2009

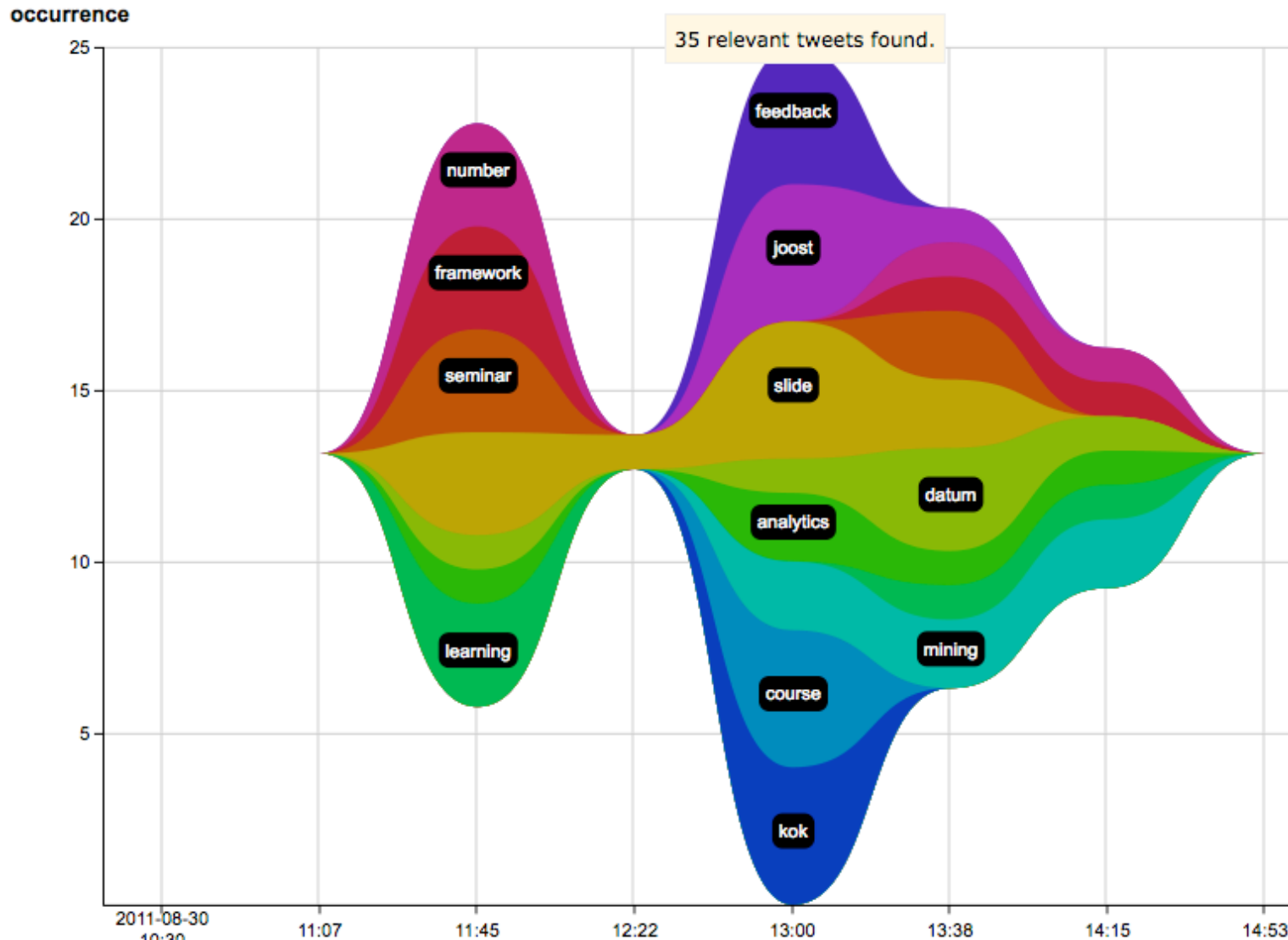
### RATING BASED RECOMMENDATIONS

posted by tanja@tanja.nl on May 16, 2009 7:00:13 AM  
**Social Freelance Jobs & Open Outsource**  
 Freelance job sites with social...

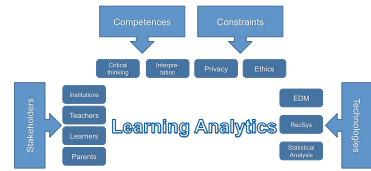


# Technologies

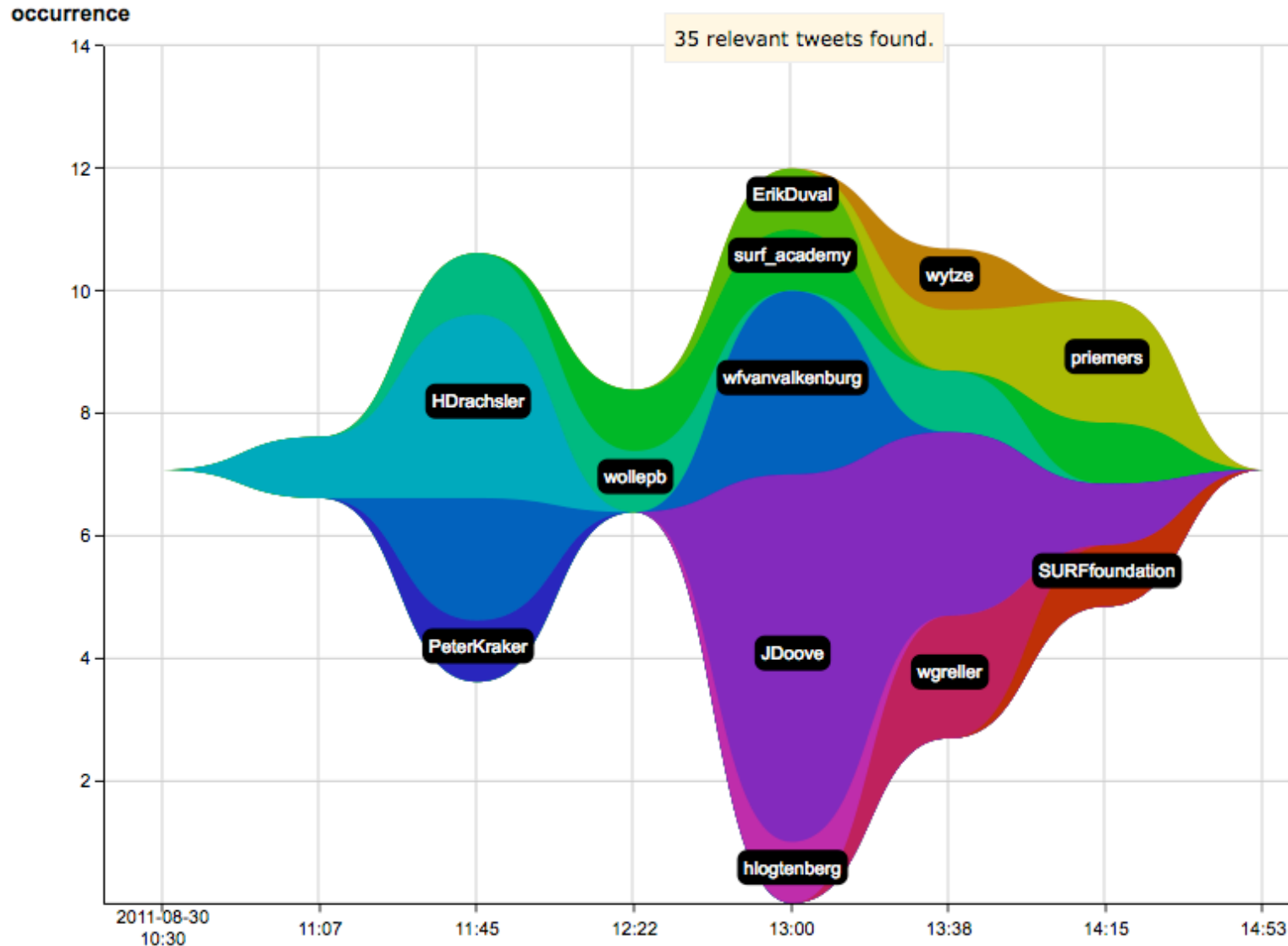
Reflection



Peter Kraker, Claudia Wagner, Fleur Jeanquartier, Stefanie N. Lindstaedt (2011):  
 On the Way to a Science Intelligence: Visualizing TEL Tweets for Trend Detection  
 Sixth European Conference on Technology Enhanced Learning (EC-TEL 2011)

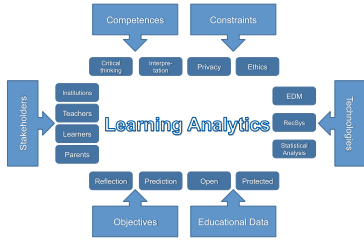


# Technologies



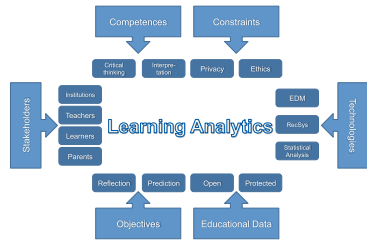
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# Constraints



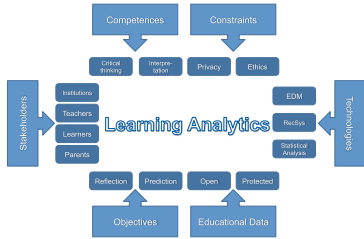


# Constraints

## 1. Legal protection





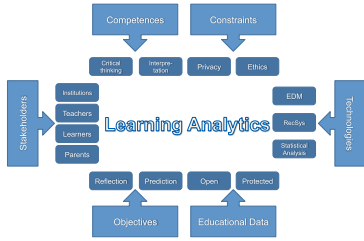


# Constraints

1. Legal protection
2. Privacy



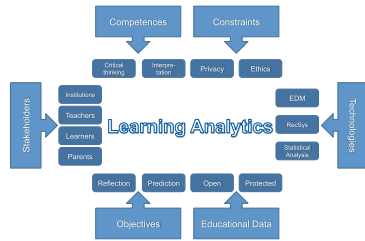




# Constraints

1. Legal protection
2. Privacy
3. Ethics

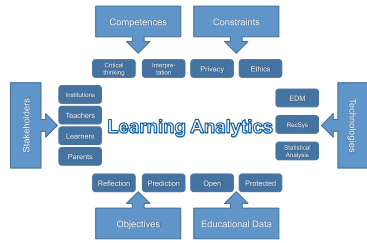




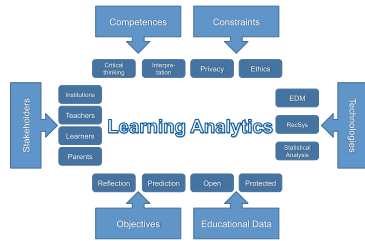
# Constraints

1. Legal protection
2. Privacy
3. Ethics
4. Ownership





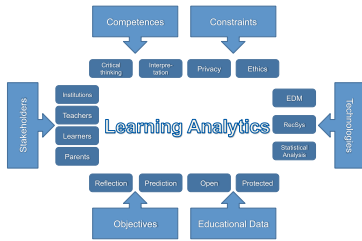
# Privacy



# Privacy

## I. Privacy as confidentiality

The right to be let alone (Warren and Brandeis, 1890)



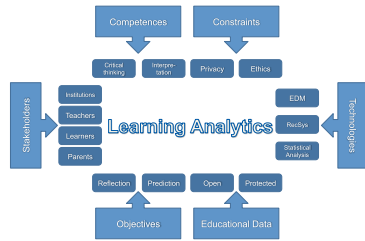
# Privacy

## 1. Privacy as confidentiality

The right to be let alone (Warren and Brandeis, 1890)

## 2. Privacy as control

The right of the individual to decide what information about herself should be communicated to others and under which circumstances.



# Privacy

## 1. Privacy as confidentiality

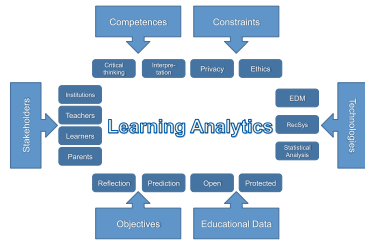
The right to be let alone (Warren and Brandeis, 1890)

## 2. Privacy as control

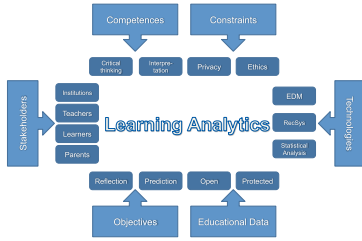
The right of the individual to decide what information about herself should be communicated to others and under which circumstances.

## 3. Privacy as practice

The right to intervene in the flows of existing data and the re-negotiation of boundaries with respect to collected data.



# Privacy solutions

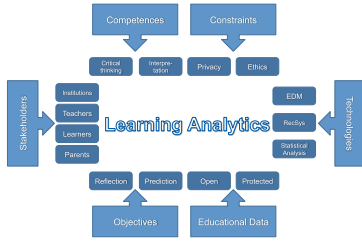


# Privacy solutions

## I. Privacy as confidentiality

Information services that minimizing, secure or anonymize the collected information





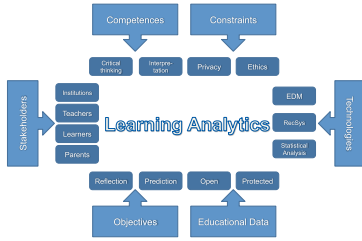
# Privacy solutions

## 1. Privacy as confidentiality

Information services that minimizing, secure or anonymize the collected information

## 2. Privacy as control

Identity Management Systems (IDMS), with access control rules



# Privacy solutions

## 1. Privacy as confidentiality

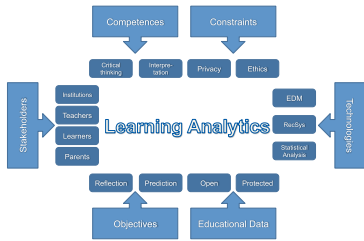
Information services that minimizing, secure or anonymize the collected information

## 2. Privacy as control

Identity Management Systems (IDMS), with access control rules

## 3. Privacy as practice

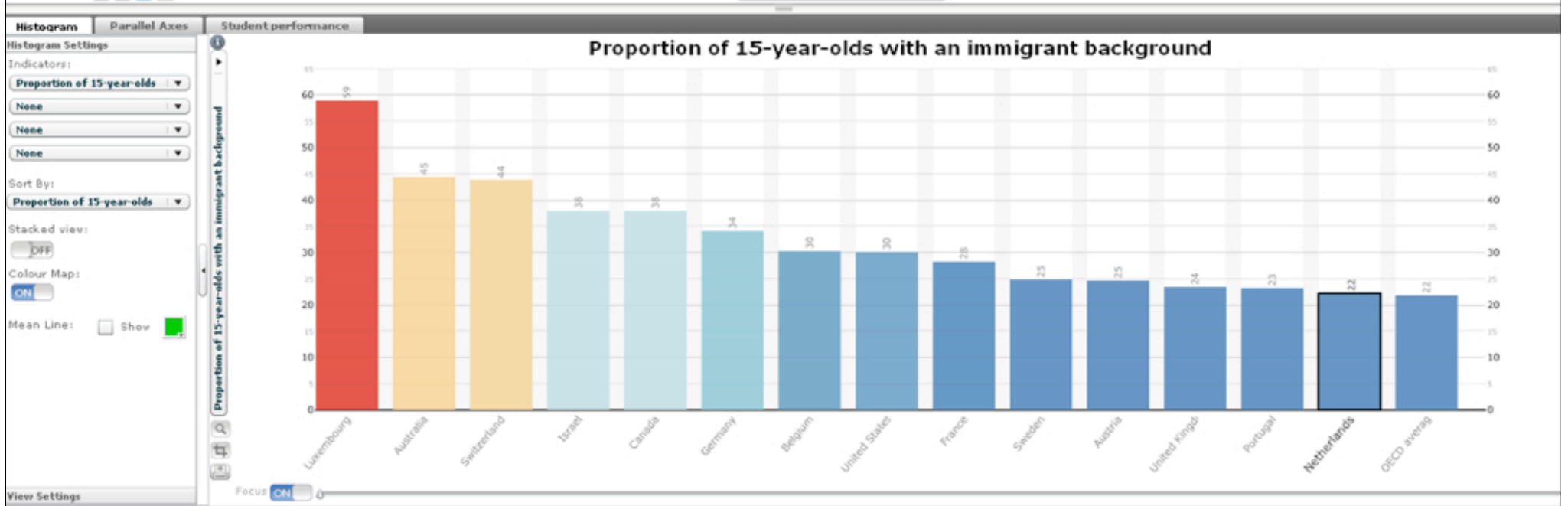
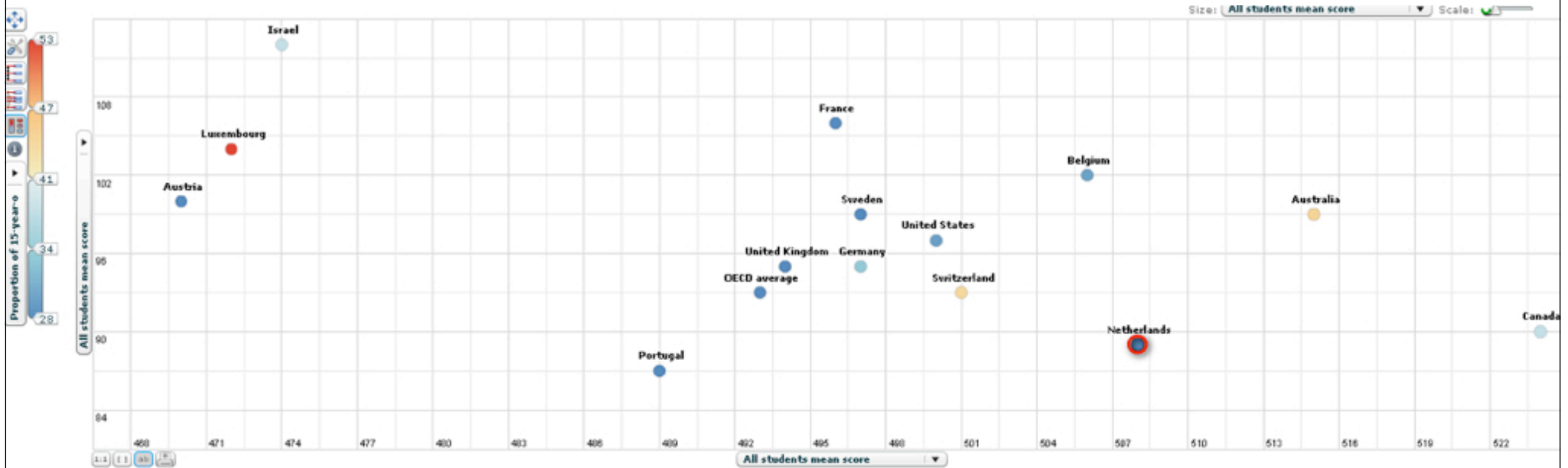
Timestamp on data, data degradation technologies



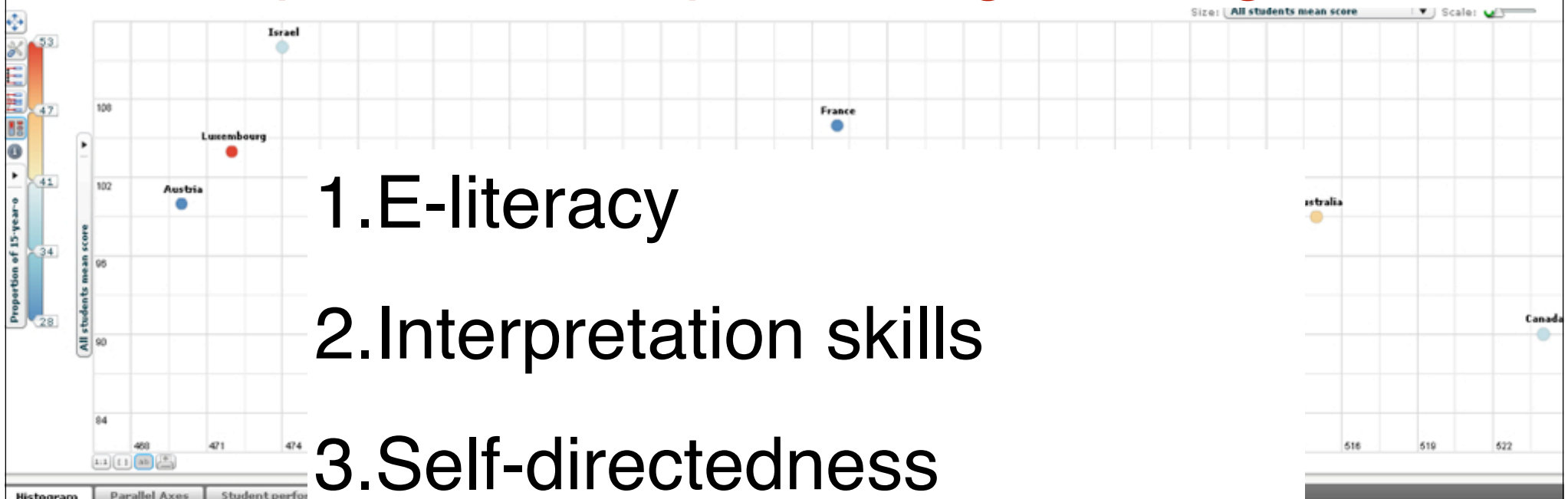
# Competences



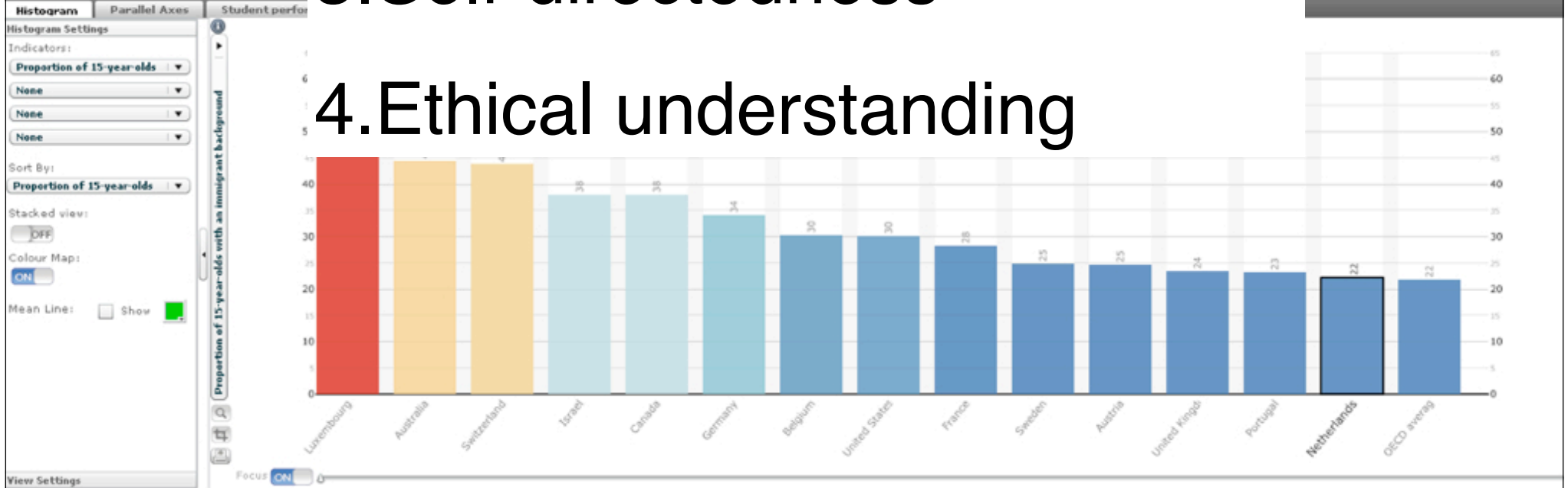
# Reading score of 15 year olds of countries compared to the percentage of migrants



# Reading score of 15 year olds of countries compared to the percentage of migrants

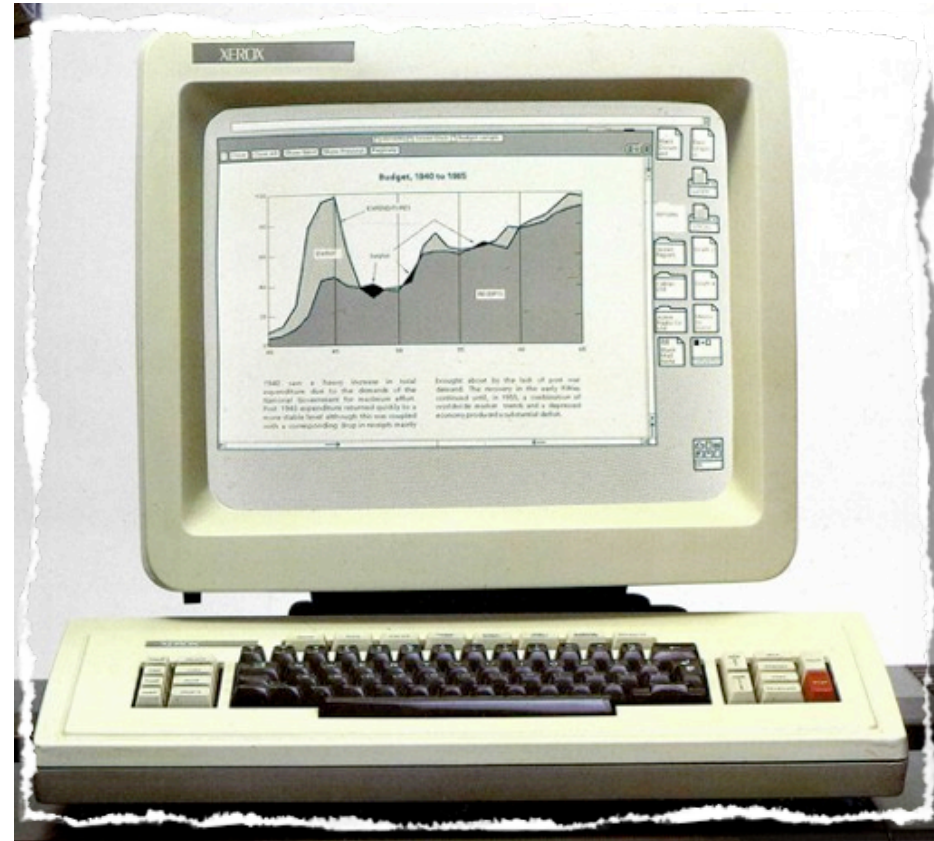


- 1. E-literacy
- 2. Interpretation skills
- 3. Self-directedness
- 4. Ethical understanding

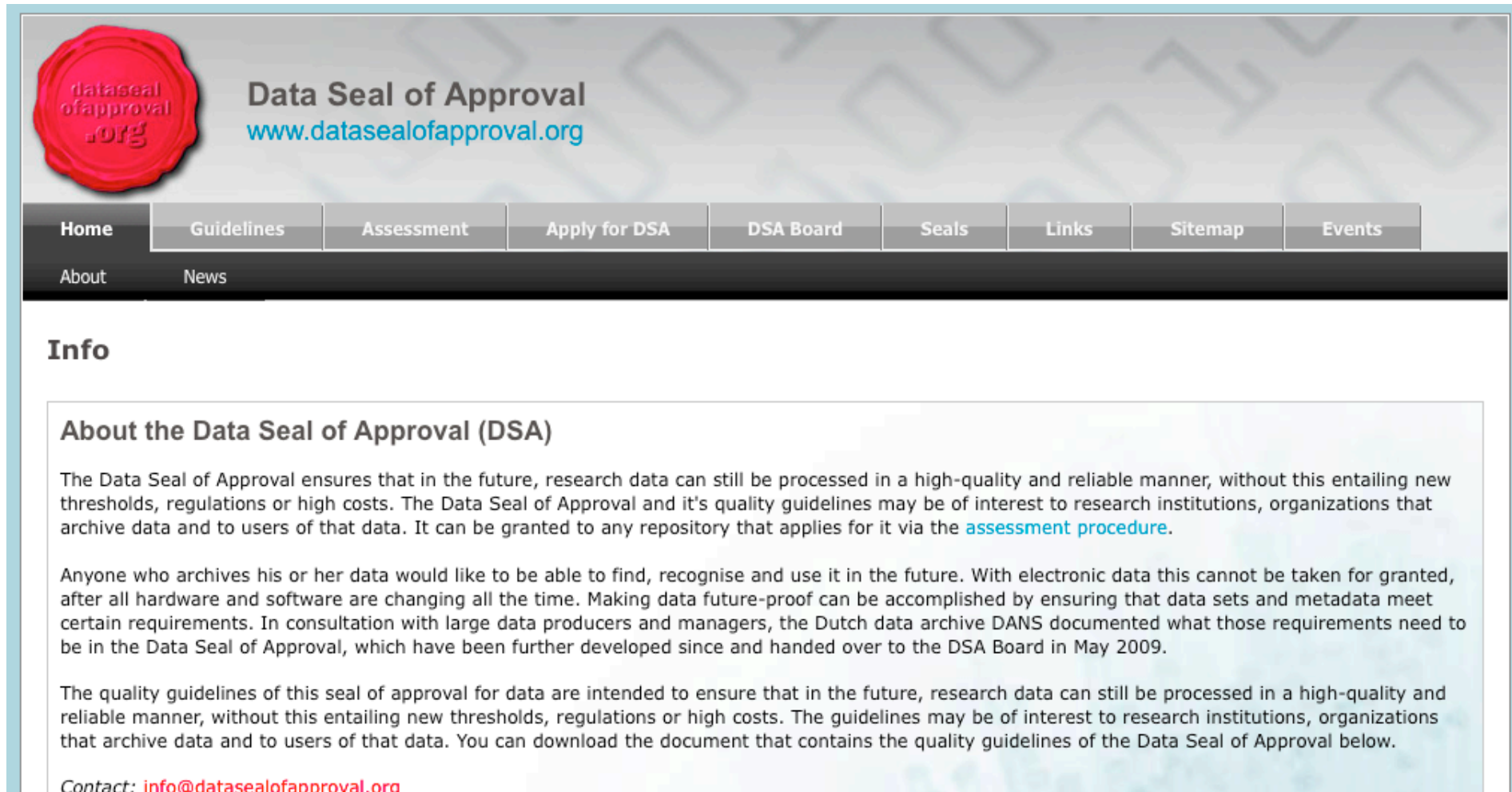


# Data initiatives

Relevant  
data initiatives  
for Learning  
Analytics



# Data Quality / Standard



The screenshot shows the homepage of the Data Seal of Approval website. At the top left is a red circular seal with the text 'dataseal ofapproval .org'. To its right, the text 'Data Seal of Approval' and the URL 'www.datasealofapproval.org' are displayed. Below this is a navigation menu with buttons for 'Home', 'Guidelines', 'Assessment', 'Apply for DSA', 'DSA Board', 'Seals', 'Links', 'Sitemap', and 'Events'. A secondary row of buttons includes 'About' and 'News'. The main content area is titled 'Info' and contains a section 'About the Data Seal of Approval (DSA)'. This section explains the purpose of the seal, its history, and provides contact information.

**Data Seal of Approval**  
[www.datasealofapproval.org](http://www.datasealofapproval.org)

Home Guidelines Assessment Apply for DSA DSA Board Seals Links Sitemap Events

About News

## Info

### About the Data Seal of Approval (DSA)

The Data Seal of Approval ensures that in the future, research data can still be processed in a high-quality and reliable manner, without this entailing new thresholds, regulations or high costs. The Data Seal of Approval and its quality guidelines may be of interest to research institutions, organizations that archive data and to users of that data. It can be granted to any repository that applies for it via the [assessment procedure](#).

Anyone who archives his or her data would like to be able to find, recognise and use it in the future. With electronic data this cannot be taken for granted, after all hardware and software are changing all the time. Making data future-proof can be accomplished by ensuring that data sets and metadata meet certain requirements. In consultation with large data producers and managers, the Dutch data archive DANS documented what those requirements need to be in the Data Seal of Approval, which have been further developed since and handed over to the DSA Board in May 2009.

The quality guidelines of this seal of approval for data are intended to ensure that in the future, research data can still be processed in a high-quality and reliable manner, without this entailing new thresholds, regulations or high costs. The guidelines may be of interest to research institutions, organizations that archive data and to users of that data. You can download the document that contains the quality guidelines of the Data Seal of Approval below.

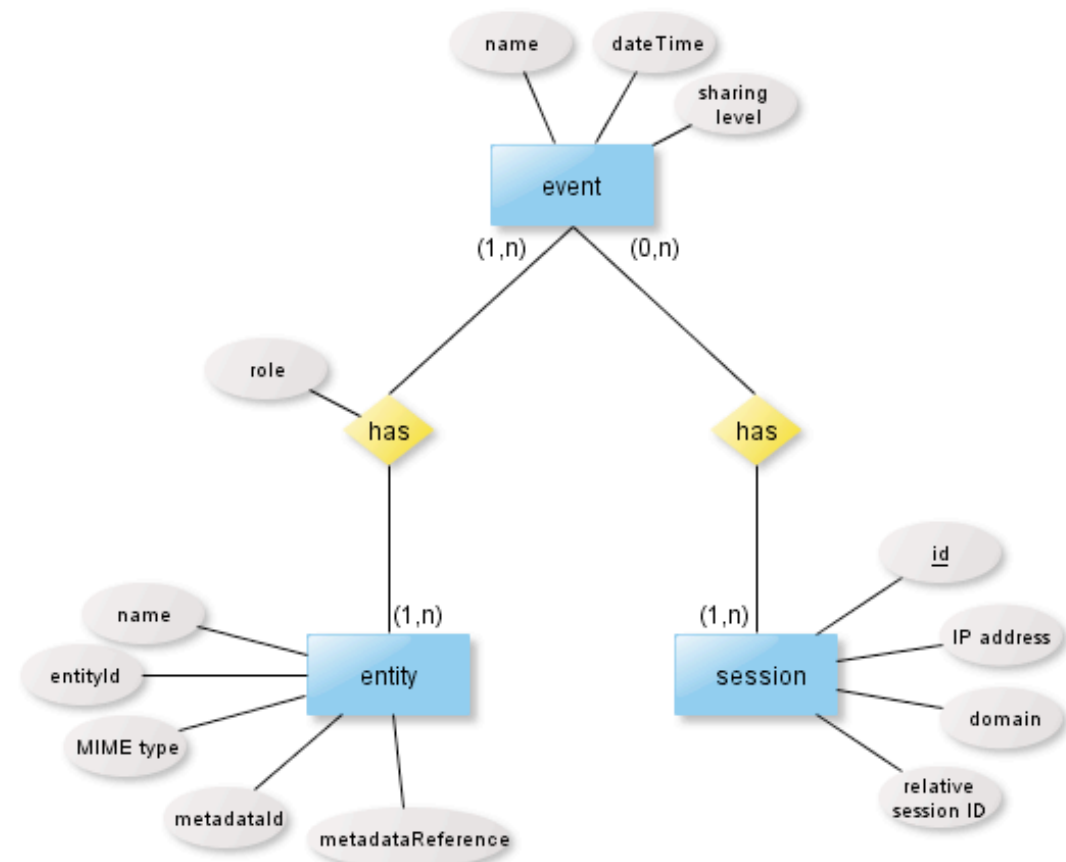
Contact: [info@datasealofapproval.org](mailto:info@datasealofapproval.org)



# Data Quality / Standard

## CAM - Contextualized Attention Metadata

[https://  
sites.google.com/site/  
camschema/](https://sites.google.com/site/camschema/)



e document that contains the quality guidelines of the Data Seal of Approval below.





DataCite

# Data Citing

Helping you to find,  
access, and reuse data

## What is DataCite?

We are a not-for-profit organisation formed in London on 1 December 2009.  
Our aim is to:

- establish easier access to scientific research data on the Internet
- increase acceptance of research data as legitimate, citable contributions to the scientific record
- support data archiving that will permit results to be verified and re-purposed for future study.

## Our structure

Just as research is global, DataCite is global, with member institutions offering services and advice directly where they are needed by the researchers.

We consist of a Managing Agent, currently the German National Library of Science and Technology, with Members and Associate Members around the

Why cite  
data?

What is  
DataCite?

What do  
we do?

## Email updates

Register for updates

Privacy by  SafeSubsc

✉ hendrik

from G

date 20

# Sharing policies

**SANDBOX** from **YAHOO!** RESEARCH

Home Demos Experiments **Data** Participate

## Data

Thank you for requesting Yahoo! Webscope data. Here are the steps to take to receive the data.

- #1. Read the data sharing agreement below and if you agree, click "agree"
- #2. You must also obtain your department chair approval to receive this data.
- #3 Your department chair that you provided will receive an email and link to the data sharing agreement. They will need to "agree" to the data sharing agreement before we can provide the data. If you have any questions please contact us at [research-data-requests@yahoo-inc.com](mailto:research-data-requests@yahoo-inc.com)

Agreement for Datasets:

- R5. Yahoo! Delicious Popular URLs and Tags, version 1.0,
- L9. Yahoo! Answers Question Types Sample of 1000, version 1.0

**YAHOO! WEBScope™ DATA LICENSE AGREEMENT INTERNATIONAL**

This data license agreement ("Agreement") is between you and Yahoo! Inc. ("Yahoo!") regarding your access to and use of the Yahoo! Webscope™ data that you wish to use and download from the Yahoo! website located at <http://webscope.sandbox.yahoo.com> ("Data"). Your access to and use of the Data is subject to the terms and conditions of this Agreement.

BY CLICKING THE "I AGREE" BUTTON, DOWNLOADING OR USING THE DATA, YOU AGREE THAT THAT YOU HAVE READ AND UNDERSTAND THE TERMS OF THIS AGREEMENT, AND THAT YOU AGREE TO BE BOUND AND TO ABIDE BY THIS AGREEMENT AND YAHOO!'S TERMS OF USE. IF YOU DO NOT UNDERSTAND THIS AGREEMENT, DO NOT DOWNLOAD, ACCESS OR USE THE DATA.

**1. SCOPE OF AGREEMENT**

1.1 The Data is valuable and confidential information of Yahoo!. You agree to use the Data only in accordance with this Agreement, and to hold the Data in strict confidence. You will not perform any analysis, reverse engineering or processing

# Sharing policies



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R5. Yahoo! Delicious Popular URLs and Tags, version 1.0,  
L9. Yahoo! Answers Question Types Sample of 1000, version 1.0

#### YAHOO! WEBSCOPE™ DATA LICENSE AGREEMENT INTERNATIONAL

This data license agreement ("Agreement") is between you and Yahoo! Inc. ("Yahoo!") regarding your access to and use of the Yahoo! Webscope™ data that you wish to use and download from the Yahoo! website located at <http://webscope.sandbox.yahoo.com> ("Data"). Your access to and use of the Data is subject to the terms and conditions of this Agreement.

BY CLICKING THE "I AGREE" BUTTON, DOWNLOADING OR USING THE DATA, YOU AGREE THAT THAT YOU HAVE READ AND UNDERSTAND THE TERMS OF THIS AGREEMENT, AND THAT YOU AGREE TO BE BOUND AND TO ABIDE BY THIS AGREEMENT AND YAHOO!'S TERMS OF USE. IF YOU DO NOT UNDERSTAND THIS AGREEMENT, DO NOT DOWNLOAD, ACCESS OR USE THE DATA.

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# Sharing policies

**SANDBOX** from **YAHOO!**  
RESEARCH

## Next Steps:

- Yahoo! will review your request
- Your department chair will be contacted for their approval
- Upon approval of the data sharing agreement, Yahoo! will send an e-mail notification with the data
- For those datasets that are not available via download we will ship those to the mailing address
- Data must be destroyed after 2 years

"agree" to the data sharing agreement before we can provide the data. If you have any questions please contact us at [research-data-requests@yahoo-inc.com](mailto:research-data-requests@yahoo-inc.com)

### Agreement for Datasets:

R5. Yahoo! Delicious Popular URLs and Tags, version 1.0,

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# Policy guidelines

**Do you want to publish some of the data that you are borrowing or to share it with someone other than your own team of researchers?**



Then you probably need to secure the author's consent.

**Do you intend using a government database?**



You do not need to seek consent for this.

*Explanation: Unless provided otherwise, government databases are basically not subject to database right (Section 3.2.6). You do not require the consent of the rightholder in order to retrieve substantial portions of a government database in the framework of scientific/scholarly research (Section 3.2.5)*

A brief guide on data licenses developed by SURF and the Centre for Intellectual Property Law (CIER), 2009 available at [www.surffoundation.nl](http://www.surffoundation.nl)



# Data platforms

Freebase

Find topics...

Data Schema Apps Docs

An entity graph of people, places and things, built by a community that loves open data.

Freebase is joining Google! [Learn more »](#)

	Sort by	write activity	Jul 6	Aug 3	last week	Facts	Topics	Top User	
Featured Data		<b>Organization</b> 19 members				26K last week	3M	760K	
Arts & Entertainment		<b>People</b> 63 members				6K last week	7M	2M	
Products & Services		<b>Education</b> 36 members				5K last week	1M	223K	
Science & Technology		<b>Awards</b> 6 members				3K last week	945K	113K	
<b>Society</b>		<b>Government</b> 35 members				2K last week	540K	117K	
Special Interests		<b>Royalty and Nobility</b> 4 members				97 last week	114K	24K	
Sports		<b>Language</b> 24 members				58 last week	52K	12K	
System		<b>Influence</b> 14 members				52 last week	154K	49K	
Time & Space		<b>Conferences and Conventions</b> 5 members				16 last week	4K	1K	
Transportation		<b>Celebrities</b> 14 members				13 last week	12K	2K	
All									

**Gridworks**

An open source power tool to fix, discover, experiment, connect and customize your data. [Learn more »](#)

**What is Freebase?**

Learn what an entity graph is, what kind of information it contains, and why you should add your data!

[Learn More »](#)

**Freebase for Developers**

- powerful queryable API
- JavaScript-based hosting framework
- libraries for other languages

[Learn More »](#)

# Data platforms

You are here: [start](#) » [research\\_planning](#) » [design\\_experiments](#)

## TECHNOLOGY ENHANCED LEARNING ANSWERGARDEN: THE TEL COMMUNITY'S SHARED RESEARCH RESOURCE DATABASE

[Research planning](#)

[System design](#)

[Data collection](#)

[Data analysis](#)

[Outputs](#)

### Design experiments





This database lists resources about an approach to system development in which research findings are collated and distilled into best practice design - an engineering approach to TEL system development

To add a record, click on the plus symbol in the corner of the table. If you want to insert a link please go to our [instruction page](#) to see the syntax for the implementation of an external link.

If you would like to discuss a particular record in the comment section below the database, please first indicate which record you are discussing by citing the red coloured number on the left side of the table.

Search for resources using field below.

3 records

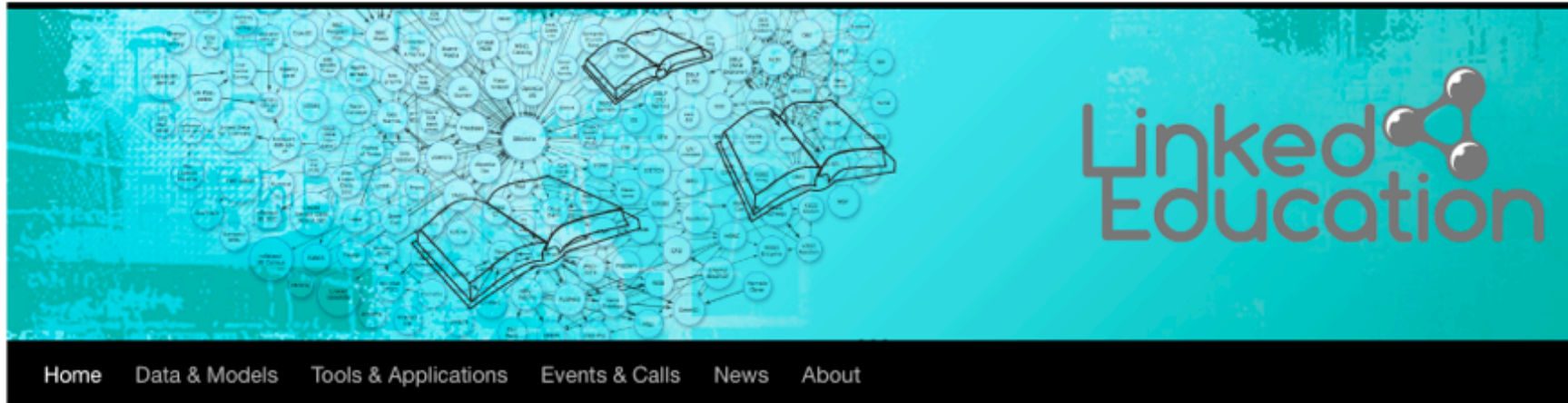
Title/Author(s)/Date –	Description –	Type/URL –
1 An impoverished machine: Challenges to human learning and instructional technology Taraban, R.(2008)	Behavior Research Methods paper on need to inform instructional technology based approaches to thermodynamics teaching from practices in the discipline	 journal paper 
2 Translating Constructivism into Instructional Design: Potential and Limitations Kempster, Y.	J. Educational Technology & Society journal Discusses how 'moderate' versions of constructivist approaches	 journal 



# Data platforms

## You are here: **Linked Education**

*Sharing educational resources in the  
Linked Data age*



[Home](#) [Data & Models](#) [Tools & Applications](#) [Events & Calls](#) [News](#) [About](#)

### Welcome to Linked Education

LinkedEducation.org is an open platform aimed at further promoting the use of [Linked Data](#) for educational purposes.

While sharing and reusing educational data across institutional and national boundaries is a general goal for both the public and the private education sector, the last decade has seen a large amount of research dedicated to Web-scale interoperability. The Linked Data approach – based [W3C standards](#) such as [RDF](#) and a set of successful principles – has evolved as the general standard for sharing data on the Web and led to vast amounts of publicly available data sets, and a multiplicity of Linked Data-consuming applications which provide added-value services. However, there is only limited take-up of Linked Data principles in the educational field.

### Email Subscription

Enter your email address to subscribe to this site and receive notifications of new posts by email.

### Recent Posts

- [LISC2011 – 1st International Workshop on Linked Science](#)
- [Welcome to LinkedEducation.org](#)

Translating Constructivism into Instructional

Design: Potential and Limitations Karpisov, Y.

J. Educational Technology & Society journal Discusses

how 'moderate' versions of constructivist approaches





# Data platforms

The screenshot shows the Mulce.org website interface. At the top, the header includes the text "Linked Education" and "Sharing educational resources in the Linked Data age". Navigation links for "Home page", "Calendar", and "Site Map" are visible, along with a search bar and a language selector for "ENGLISH" and "FRANÇAIS". The main banner features the "mulce" logo (Multimodal Learning Corpus Exchange) and the text "Mulce.org Documentation".

The article page is titled "Re-analysis of a LETEC corpus with KSV" and is categorized under "Tutorials". It includes a sub-header "ARTICLE LANGUAGE AND TRANSLATIONS" with a link to the French version: "français : Ré-analyse des forums d'un corpus avec KSV". The article text states: "Discussions board extracted from the LETEC Simuligne have been re-analyzed with KSV (Knowledge Space Visualizer). Reconsidering (Reffay & Chanier, 2003) another Social Network Analysis (SNA)".

Below the text is a figure showing five network graphs labeled a. sim=1, b. sim=10, c. sim=40, d. sim=80, and e. sim=180, illustrating the evolution of social network analysis. The caption reads: "Figure 2. Les communications dans le groupe Apiciter de 3 avril au 11 mai pour différents seuils d'isolation." The article concludes with the text: "The goals of this paper are twofold: (1) to demonstrate how previously published data can be re-analyzed to gain a new perspective on CSCL dynamics and (2) to propose a new measure of social cohesion that was developed through improvements to existing analytic tools. In this study, we downloaded the Simuligne corpus from the publicly available Mulce".

On the left side, a sidebar menu lists various sections: "Tutorials", "Editing corpora", "Mulce ANR project", "Publications", and "CSCL 2011 'Productive re-use of CSCL data and analytic tools to provide a new perspective on group cohesion'".

On the right side, there is a sidebar with a "Tutorial CSCL 2011 'Introduction to Social Network Analysis theory and its application to CSCL'" and a section titled "In the same section" containing "The Mulce data bank and its services".

At the bottom, there is a footer with the text "Translating Constructivism into Instructional Design: Potential and Limitations" and "how 'moderate' versions of constructivist approaches" followed by a "Journal" logo.

# Data platforms

The image shows a screenshot of the 'Linked Education' website. The main header includes the title 'Linked Education' and the tagline 'Sharing educational resources in the Linked Data age'. Navigation links for 'Home page', 'Calendar', and 'Site Map' are visible. A search bar and language options for 'ENGLISH' and 'FRANÇAIS' are also present. A 'mulce' logo is featured in the background. A 'PSLC DATASHOP' overlay is positioned in the foreground, providing a login interface and a list of datasets. The login section includes fields for 'Username' and 'Password', a 'Log in' button, and a 'Forgot password?' link. Below the login section, there are options for 'Carnegie Mellon users' and 'Log in with WebISO'. The dataset list is organized into three sections: 'Public Datasets', 'Other Datasets', and 'Chinese Tone Study'. Each section contains a table with columns for 'Dataset', 'Domain/LearnLab', 'Dates', 'Principal Investigator', and 'Status'. The 'Public Datasets' section lists two datasets related to handwriting examples. The 'Chinese Tone Study' section lists one dataset. The 'Does Treating Student Uncertainty...' section lists one dataset. The bottom of the image shows a snippet of an article titled 'Translating Constructivism into Instructional Design: Potential and Limitations'.

**Linked Education**  
Sharing educational resources in the Linked Data age

Home page | Calendar | Site Map

ENGLISH | FRANÇAIS

**mulce**  
Multimodal Learning

**PSLC DATASHOP**  
a data analysis service for the learning science community


Help > | Login

Username:

Password:

**Log in** | [Forgot password?](#)

Carnegie Mellon users | **Log in with WebISO**



New user? | **Sign up now!**  
**It's free and easy!**

**Public Datasets** | [Other Datasets](#)

[Show announcements](#)

**A Multimodal Interface for Solving Equations**

Dataset	Domain/LearnLab	Dates	Principal Investigator	Status
Handwriting/Examples Dec 2006	Math/Algebra	Oct 12, 2006 - Dec 20, 2006	Lisa Anthony	complete
Handwriting2/Examples Spring 2007	Math/Algebra	Mar 22, 2007 - May 24, 2007	Lisa Anthony	complete

**Chinese Tone Study**

Dataset	Domain/LearnLab	Dates	Principal Investigator	Status
Chinese_tonestudy	Language/Chinese	Sep 6, 2005 - Apr 12, 2006	Ying Liu	complete

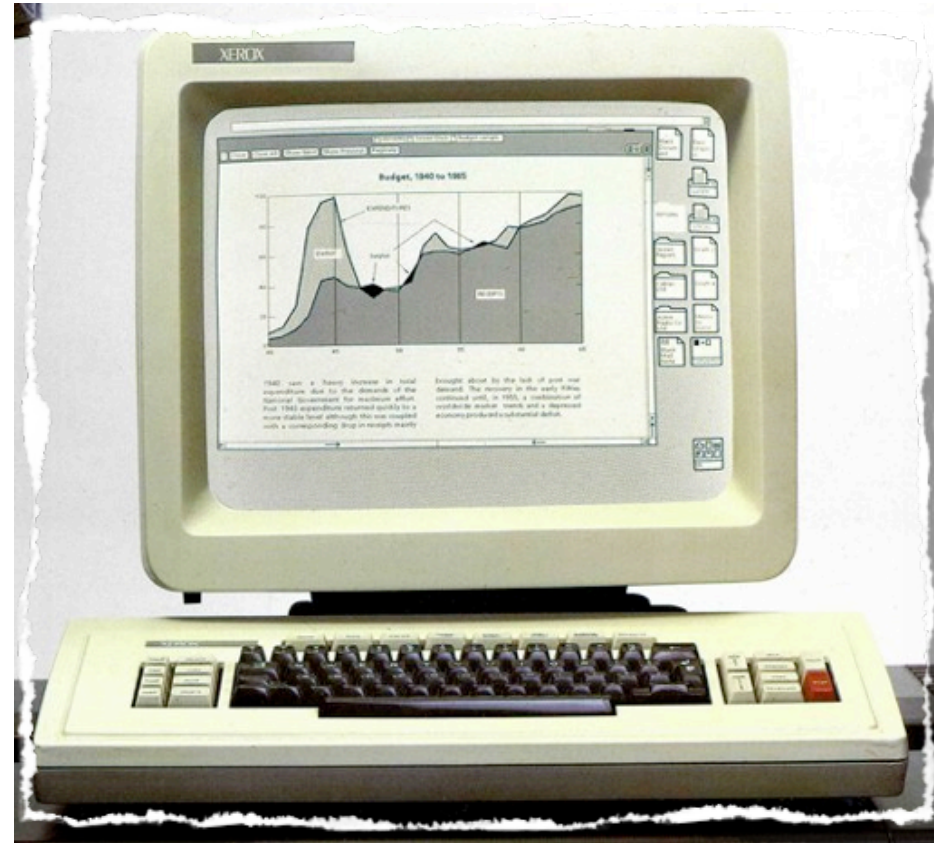
**Does Treating Student Uncertainty as a Learning Impasse Improve Learning in Spoken Dialogue Tutoring**

Dataset	Domain/LearnLab	Dates	Principal Investigator	Status
WOZ Uncertainty Adaptation	Science/Physics	Dec 1, 2006 - Apr 30, 2007	Kate Forbes-Riley	files only

Tools. In this study, we downloaded the Simuligne corpus from the publicly available mulce...  
Translating Constructivism into Instructional Design: Potential and Limitations  
how 'moderate' versions of constructivist approaches journal

# Participation

How you can  
become  
involved...



# Learning Analytics Challenges

- Reduce the drop-out rate by 10% through applying Learning Analytics prediction and reflection techniques.
- Customize data mining techniques to learning and educational reality.
- Evaluation criteria for Learning Analytics applications
- Generic infrastructure for sharing, analyzing and reusing educational data.
- Applying existing privacy and legal protection solutions for Learning Analytics.





# Open issues

- 1.** Evaluation of LA approaches
- 2.** Comparable experiments
- 3.** Publicly available datasets
- 4.** Body of knowledge
- 5.** New Learning Analytic applications
- 6.** Privacy and data protection
- 7.** Best practice and ethical guidelines



# Learning Analytics Questionnaire

[http://bit.ly/  
Learning\\_Analytics](http://bit.ly/Learning_Analytics)

qualtrics.com

## Introduction

Learning Analytics is a new scientific domain that aims to use educational data produced by students and teachers through their browsing and interaction behaviour in order to produce new insights into the learning and teaching processes, and to improve them.

A typical example for Learning Analytics is the analysis of data logs from online learning systems (e.g. LMS). This analysis is then shown to users in a visualisation which makes them aware of their performance and progress. Sometimes this is combined with the possibility to compare yourself to other peers, in order to position yourself in a group of learners. The data is also useful to teachers to see how a group of learners develops shared knowledge.

**The survey below will take around 12mins to complete.** It aims to explore the expectations and priorities that stakeholders put into Learning Analytics. Questions are organised in seven parts (including some personal info) along our Learning Analytics framework model (below), which consists six key dimensions (outer circle) and related sub-domains (inner circle).

```
graph TD; Stakeholders[Stakeholders] --> LA[Learning Analytics]; Method[Method] --> LA; Objectives[Objectives] --> Reflection[Reflection] --> Prediction[Prediction]; Data[Data] --> Open[Open] --> Protected[Protected]; Reflection --> LA; Prediction --> LA; Open --> LA; Protected --> LA; Competences[Competences] --> CT[Critical thinking] --> Interpretation[Interpretation]; Constraints[Constraints] --> Privacy[Privacy] --> Ethics[Ethics]; CT --> LA; Interpretation --> LA; Privacy --> LA; Ethics --> LA; Institutions[Institutions] --> LA; Teachers[Teachers] --> LA; Learners[Learners] --> LA; Parents[Parents] --> LA; EDM[EDM] --> LA; ML[Machine Learning] --> LA; SA[Statistical Analysis] --> LA;
```

Learning Analytics framework (Greller & Drachler 2011)

Next >>

# Special Interest Group - dataTEL

TEL europe • eu

## dataTEL - EATEL SIG on Data-driven Research and Learning Analytics

In the educational world, only very limited datasets are publicly available and no agreed quality standards exist on the personalization of learning. The SIG dataTEL aims to address these issues by advancing data driven research to gain verifiable and valid results and to develop a body of knowledge about the personalization of learning.

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## dataTEL - EATEL SIG on Data-driven Research and Learning Analytics



**Owner:** [Hendrik Drachsler](#)  
Group members: 66

The growth of data in the knowledge society creates opportunities for new insights through advanced analysis methods based on information retrieval technologies. Educational institutions also create and own huge datasets on their students and course activities. But they make little use of the data when considering new educational services, recommending suitable peers or content, and improving the personalization of learning.

The SIG dataTEL aims to address these issues by advancing data-driven research to gain verifiable and valid results and to develop a body of knowledge about the personalization of learning. It builds upon the positive outcomes of the dataTEL Theme Team funded by the STELLAR Network of Excellence. Its intentions are to foster the cooperation between different Learning Analytics research units and to act as their representative to other relevant communities.

Therefore, its main objectives are:

### Networking:

- Fostering of a research network on educational dataset driven research
- Improving the exchange with relevant research communities
- Representing dataTEL researchers to promote the release of open datasets from educational providers

### Privacy and Ethics:

- Contributing to policies on ethical implications (privacy and legal protection rights)
- Suggesting guidelines for the anonymisation of data and

# Special Interest Group - dataTEL

**TEL** europe • eu

**dataTEL - EATEL SIG on Data-driven Research and Learning**

In the educational world, only very limited datasets are publicly available and no agreed quality standards exist on the personalization of learning. The SIG dataTEL aims to address these issues by advancing data driven research to gain verifiable and valid results and to develop a body of knowledge about the personalization of learning.

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**dataTEL**  
Powered by **STELLAR**  
network of excellence

**Owner:** Hendrik Drachsler  
Group members: 66

1. Networking
2. Privacy, legal, ethics
3. LA datasets
4. LA products

<http://bit.ly/datatel>

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#### Privacy and Ethics:

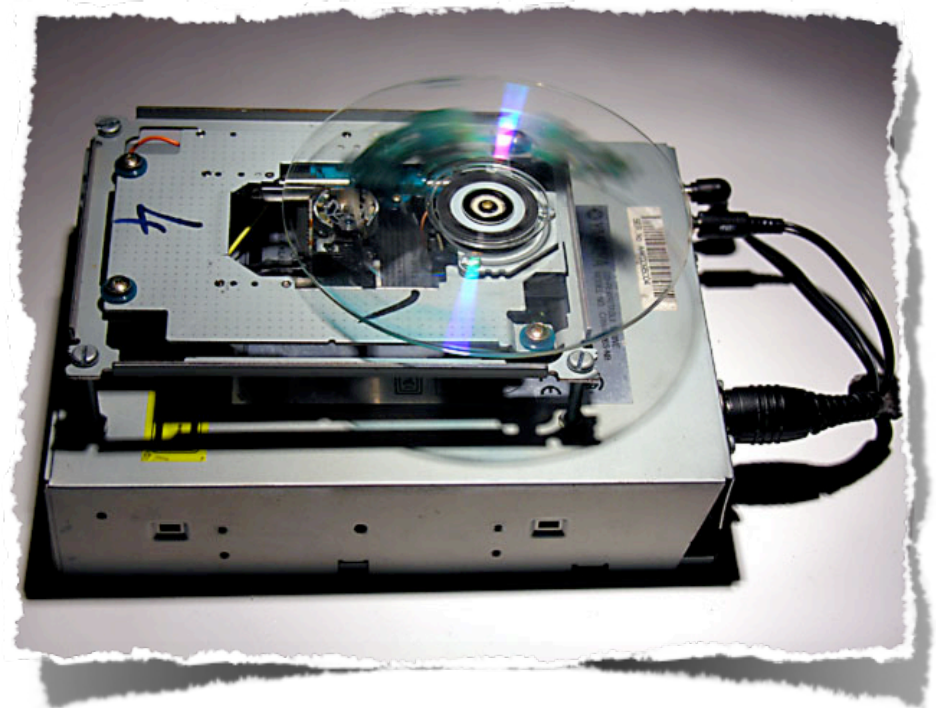
- Contributing to policies on ethical implications (privacy and legal protection rights)
- Suggesting guidelines for the anonymisation of data and



# Many Thanks::Questions?

This presentation is available at:

[slideshare.com/Drachsler](http://slideshare.com/Drachsler)



Blackmore's custom-built LSD Drive  
<http://www.flickr.com/photos/rootoftwo/>

**Email:** [hendrik.drachsler@ou.nl](mailto:hendrik.drachsler@ou.nl)

**Email:** [wolfgang.greller@ou.nl](mailto:wolfgang.greller@ou.nl)