



Modeling the process of authentic assessment in the technology-rich classroom: Why and how?

Peter Reimann

**Scientific Coordinator Next-Tell
& Professor of Education, University of Sydney.**

Overview



- **Authentic assessment**
- **From methods to models**
- **The ECAAD modeling method and modeling toolkit**
- **Integration into ICT-enhanced learning environments**
- **Sharing models**
- **Applying to 21C learning**

What do we mean with authentic assessment?



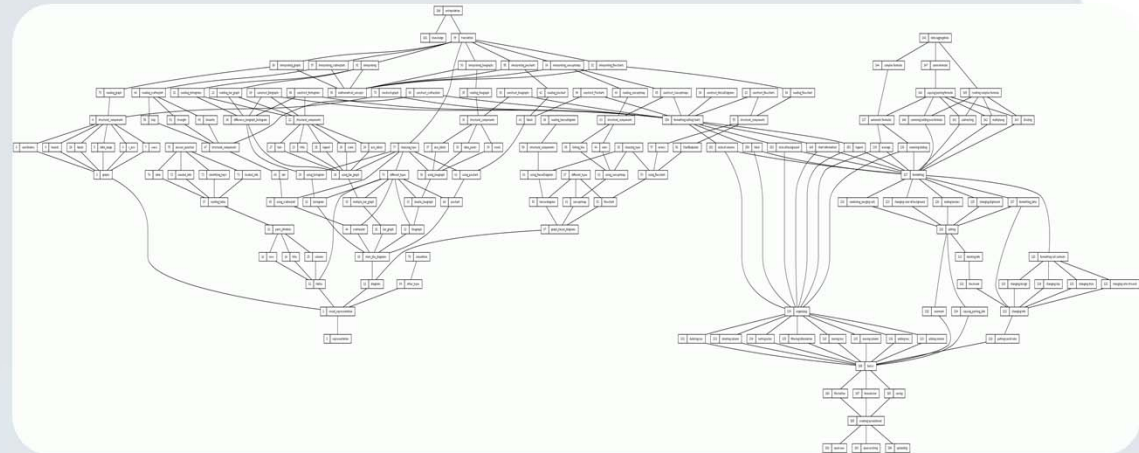
- **The “test” task resembles authentic practices, and the “test” situation resembles the practice situation (including tools and artifacts);**
- **The assessment purpose is primarily formative—it delivers information that guides pedagogical decision making (“here and now”);**
- **The assessment gives a voice to the assessed-- “authenticity” needs to be perceived by the students, possibly negotiated with them;**
- **The assessment is unobtrusive (“embedded”); the use of IT is extensive.**

STEM Teaching with Google Spreadsheets

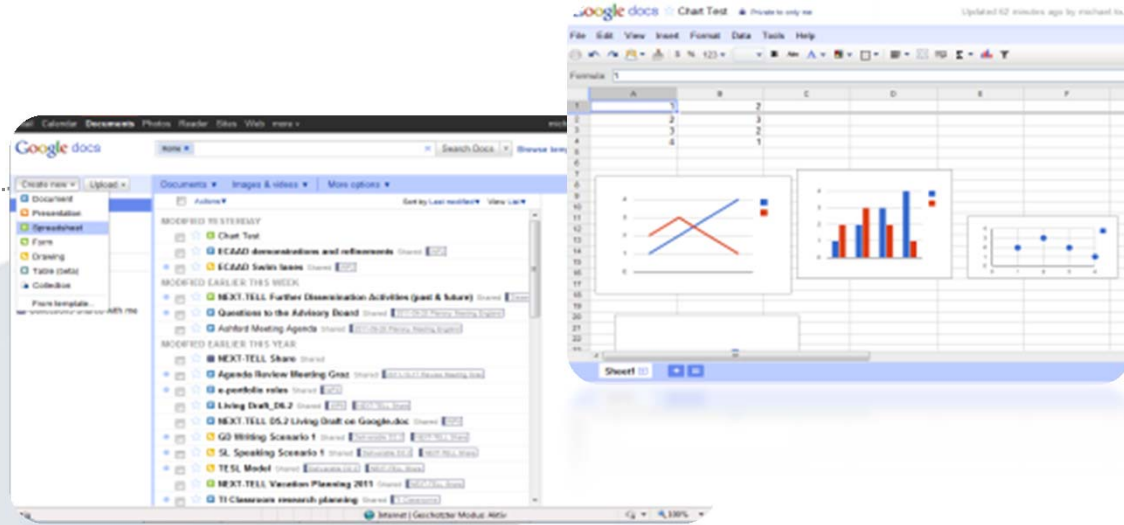


Domain: Handling quantitative data (e.g., measurement data)

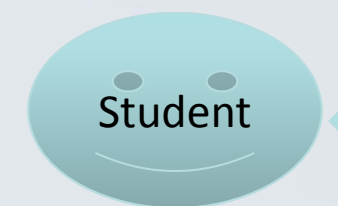
- Software basics (working with Google Spreadsheet)
- Editing data
- Formatting data
- Organizing data
- Aggregating data
- Visualizing data



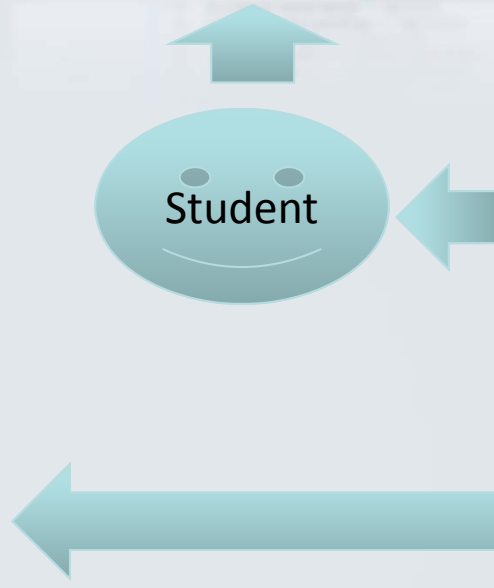
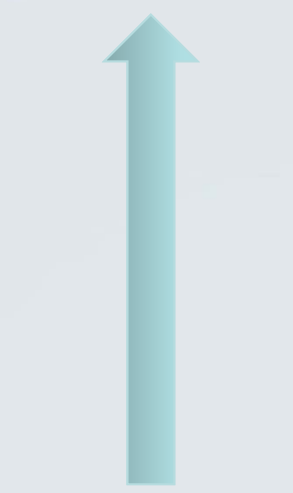
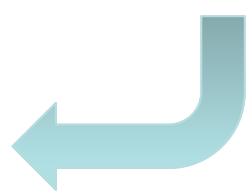
(104 sub-skills)



Problems



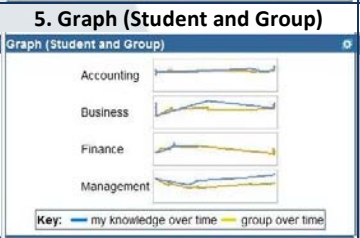
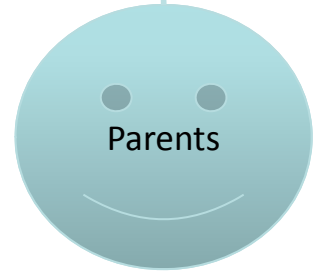
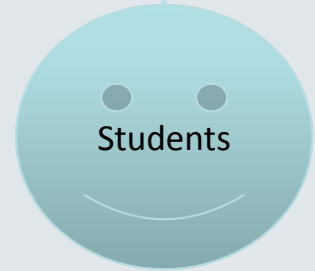
cbKST
Analysis
Server
(ProNiFa)



Vision Element #1



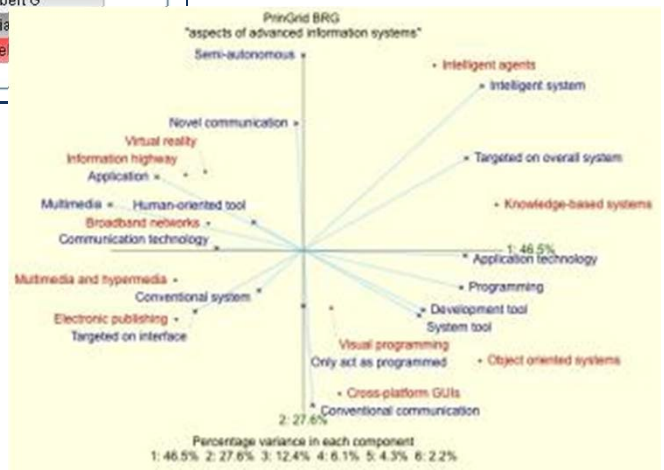
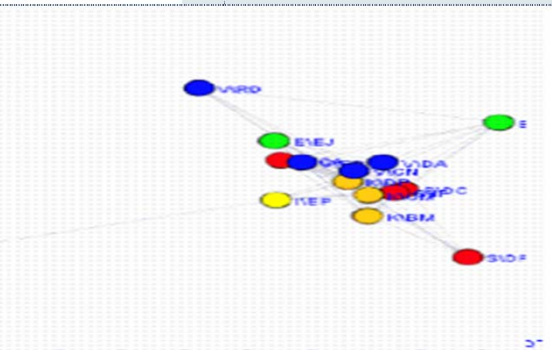
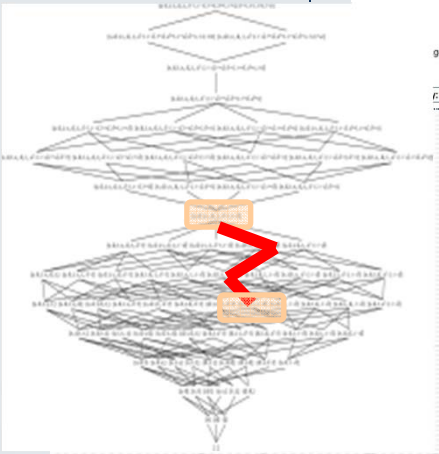
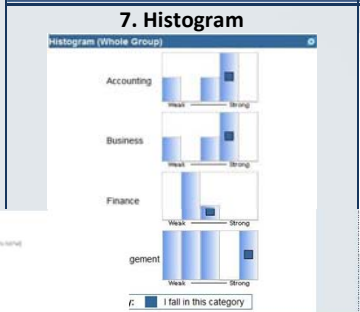
In the 21st Century Classroom, ICT is used to engage students in meaningful learning activities, and to provide teachers and students with nuanced information about learning when it is needed and in a format that is supportive of pedagogical decision making, thus optimizing the level of stimulation, challenge, and feedback density.



6. Table

Topic	Very Weak	Weak	OK	Good	Very Good
Accounting					
Business					
Finance					
Management					

Key: my knowledge is in this category



Vision element #2

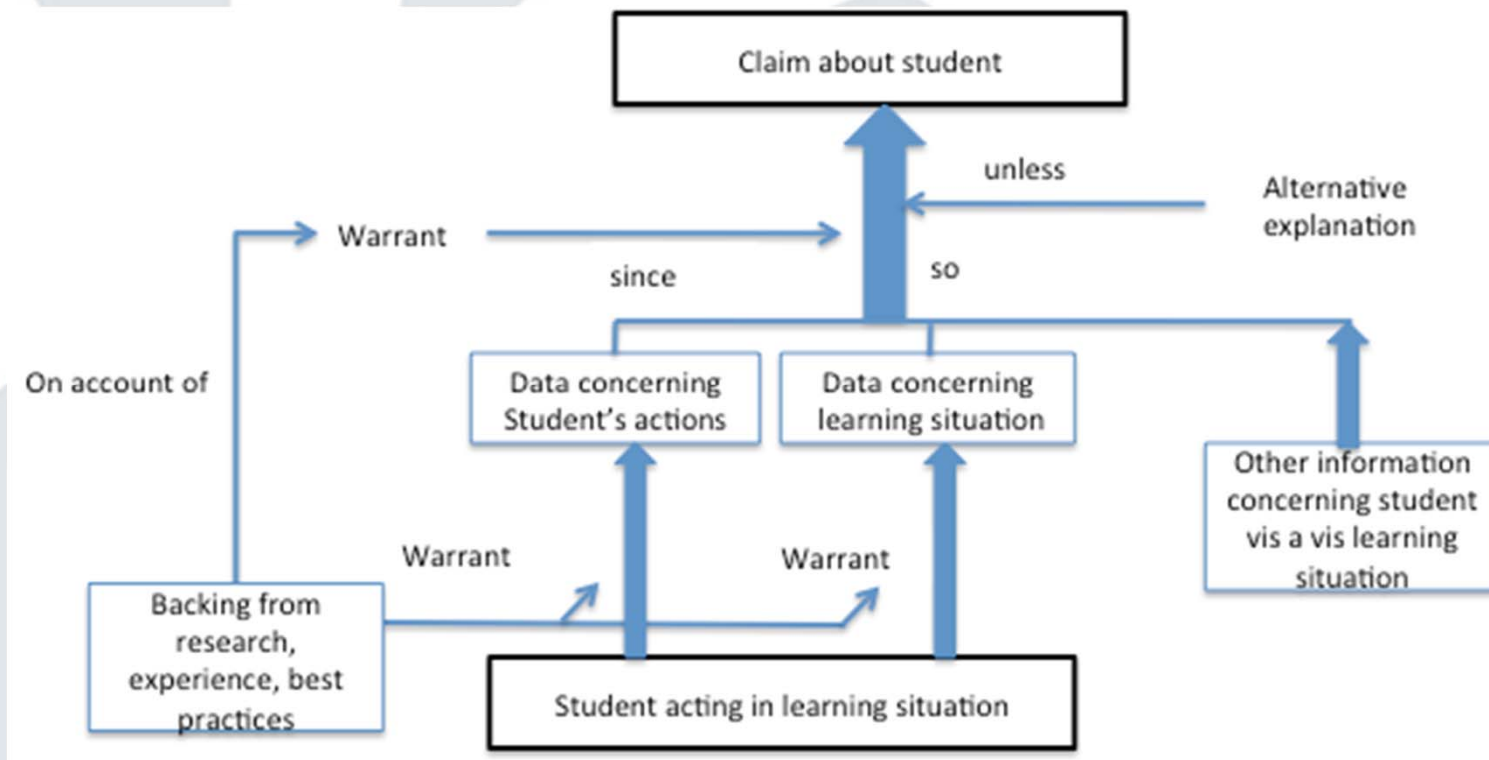


NEXT-TELL will provide an *innovation platform*: A set of methods and tools that can support teachers in continuously and collaboratively innovating the use of ICT for teaching, learning and formative classroom assessment.

This platform will support the stages of:

- creating the innovation
- deploying it in classrooms
- researching its effects
- communicating findings to peers and policy makers

Assessment as evidentiary argument (Mislevy)

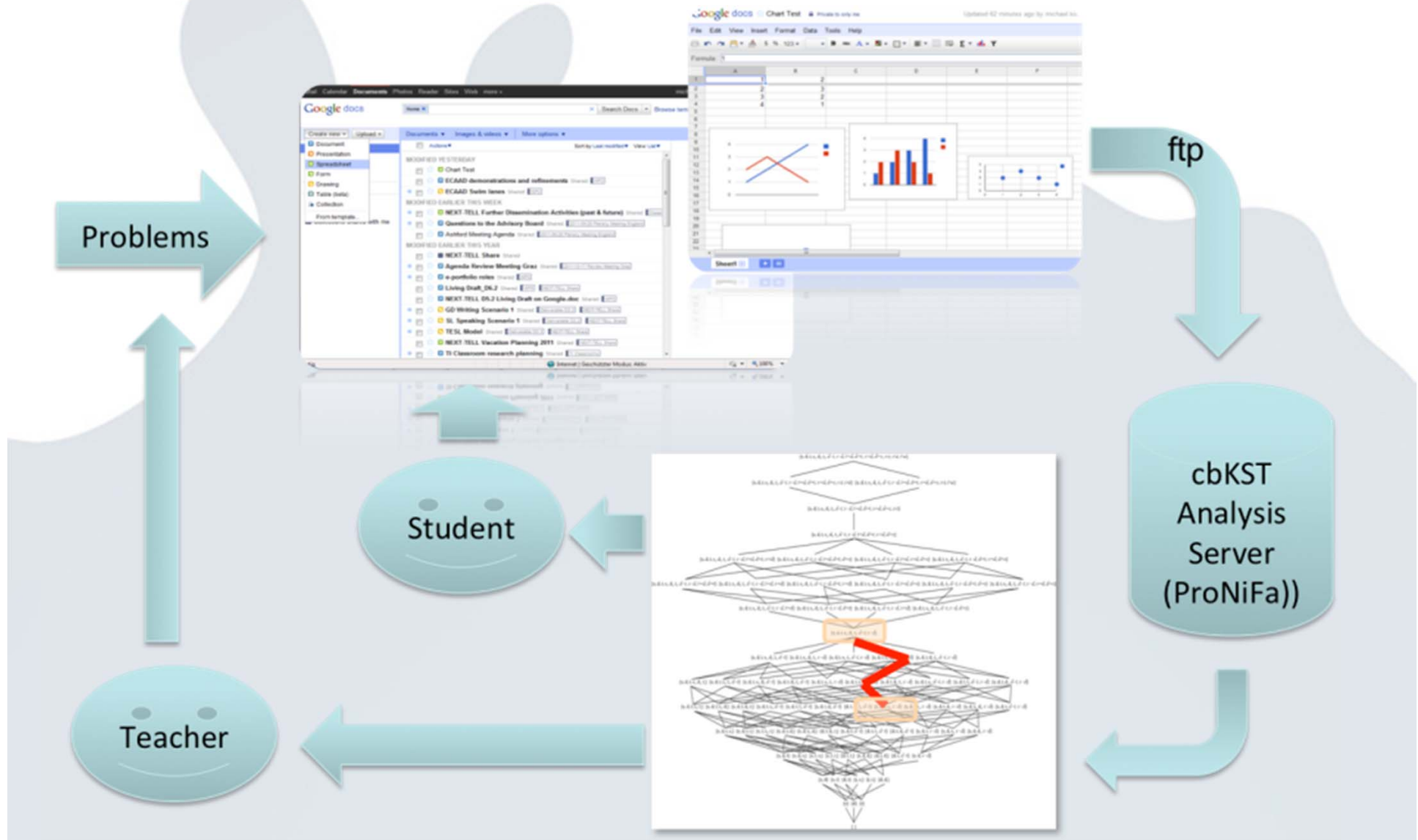


Teachers need to be enabled and empowered to engage in this kind of argument!



FROM (ASSESSMENT) METHODS TO MODELS

From methods to models



Why models?



“Models are knowledge that can be operationalized.”

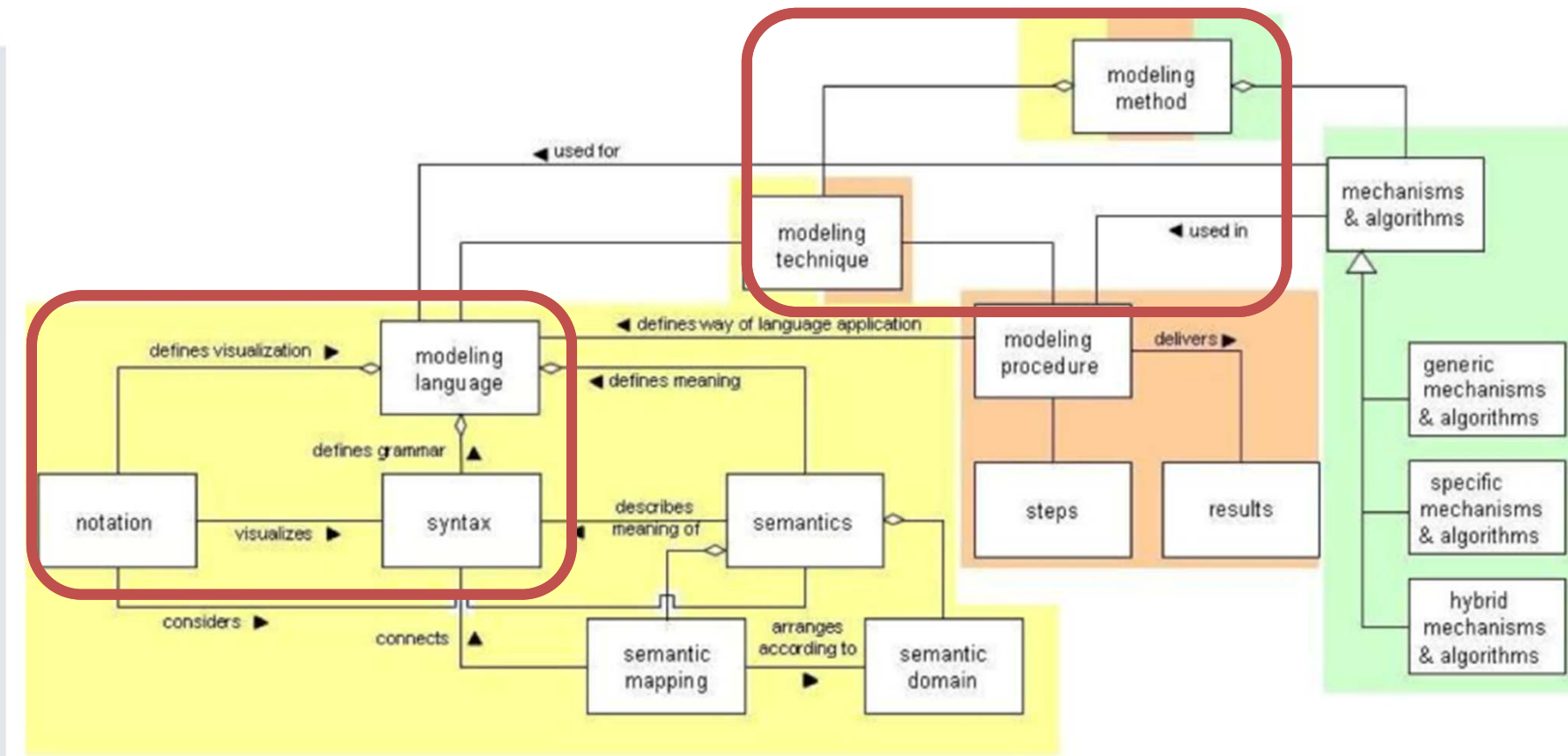
(Karagiannis, Hoffmann, Höfferer, 2008)

Models of:

- Assessment methods
- Learning activity sequences
 - Learners
 - Inquiry workflows
 - Strategic ICT plans

- Models are a clear specification of a target state;
- Models form the basis for documentation and communication, in general: knowledge management;
- Models are a means of for evaluation: What is the delta between model and implementation(s)?
- Models can be semi-automatically implemented.

Meta-modeling framework



(Karagiannis et al., 2002)

Why meta-modeling?



- **Separation of method and notation:**
 - The same method can be represented in multiple forms;
 - Information hiding: role-specific views;
 - Separation of areas of concern.
- **Models can be analysed computationally.**
- **Implementation can be accelerated**

Notebook

Modeling object: Teacher Explanation of example (Learning Activity)

Description Initial state Final state Activity details

Name:
Teacher Explanation of example

Linked activity sequence:

Model directory	Model
/Models/ECAAD Demonstation/3. Learning Sequences/ Teacher Expla	

Description:
This activities is related to the teacher explaining details on the case to be used in class and motivate the students to collaboratively discuss the input provided.

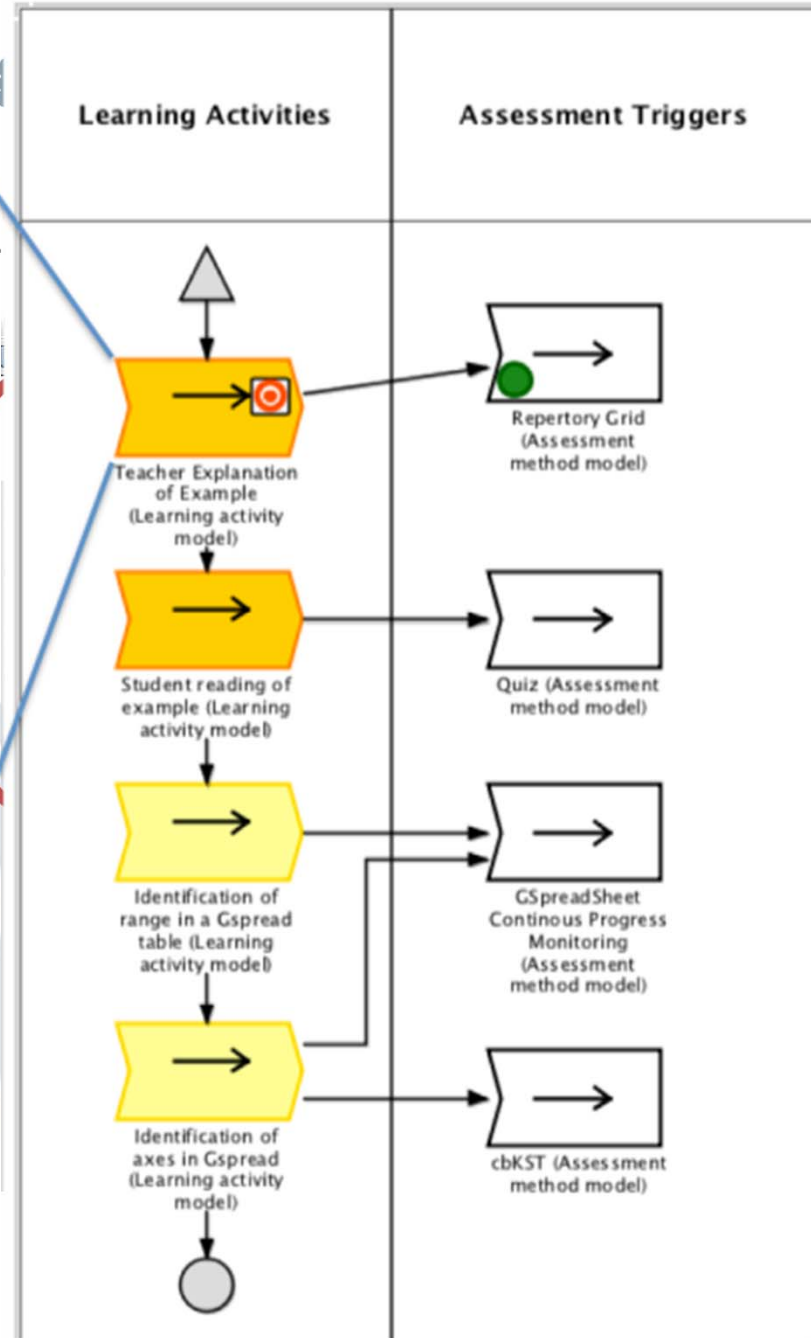
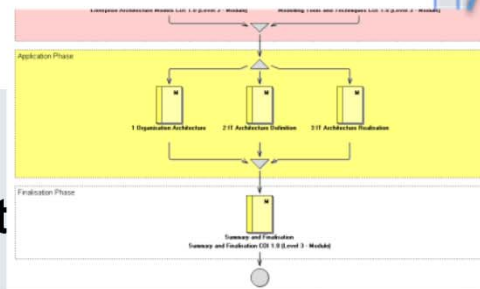
Type:
Informative activity

Roles involved:

Model directory	Model	Model type	Object	Class
-----------------	-------	------------	--------	-------

Communication, Negotiation,
Decision Making

Modeling met



Level I

(...)

Level 1

Constraints

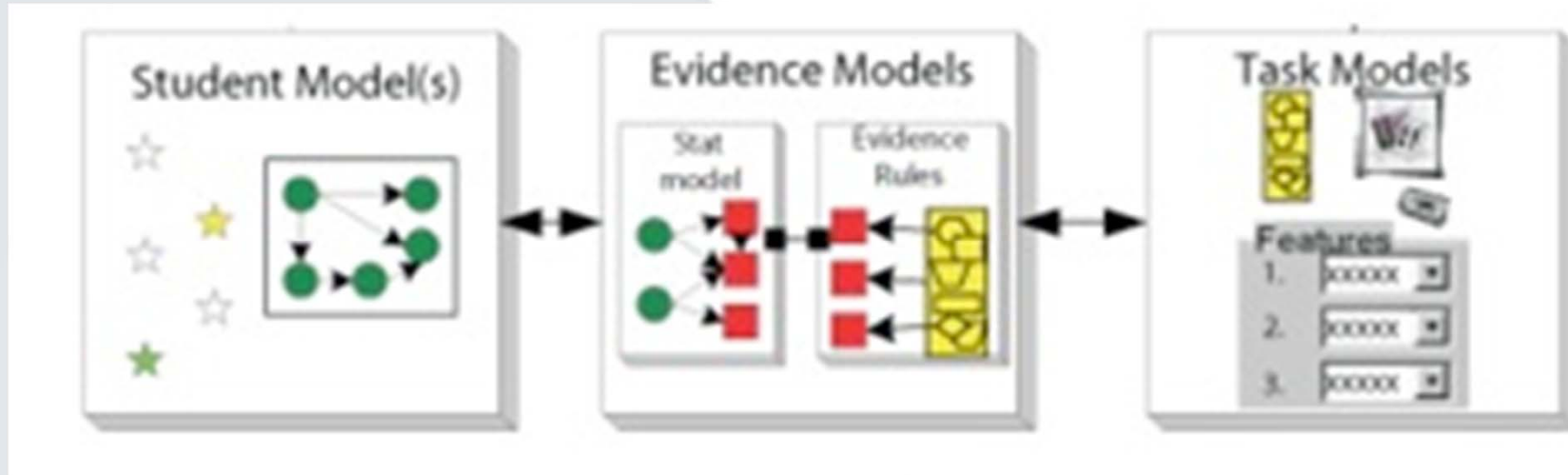
Inter-
pretation

Level 0



THE ECAAD MODELING METHOD

Evidence-centered assessment design (Mislevy)



ECD in Next-Tell

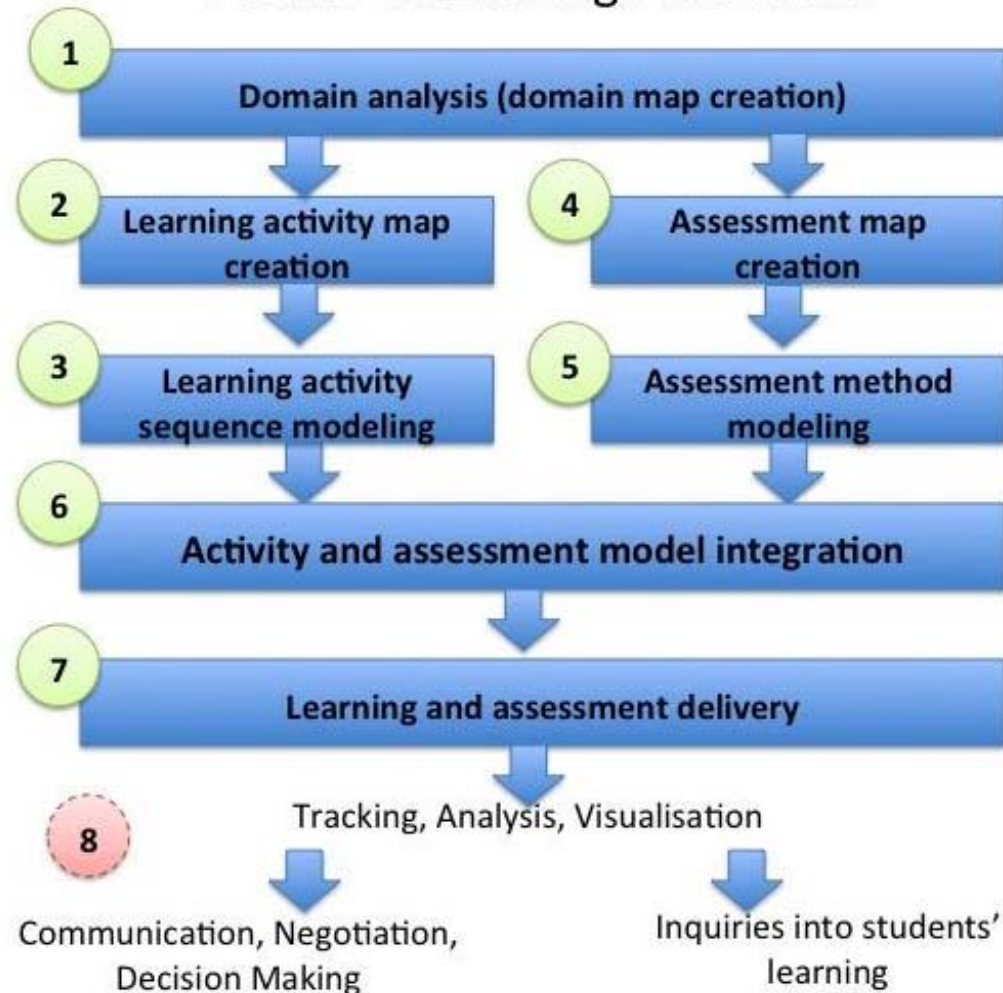


ECD	Next-Tell	Modeling approach
Task model	Activity sequence & embedded assessment methods	Process modeling
Evidence model	Triggered tracking & decision rules	Data modeling & Decision modeling
Student model	From simple incremental to probabilistic & Visualisation & Negotiation	-/-

The modelling procedure



ECAAD Modelling Procedure



Modeling concepts

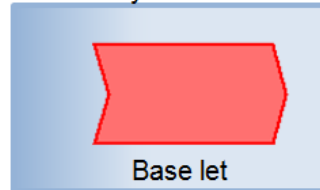


Let sequence



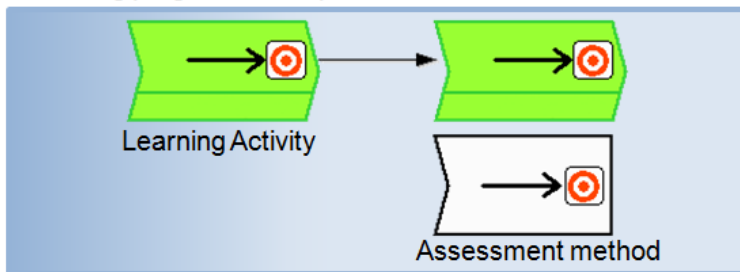
Instance let

Let library



Base let

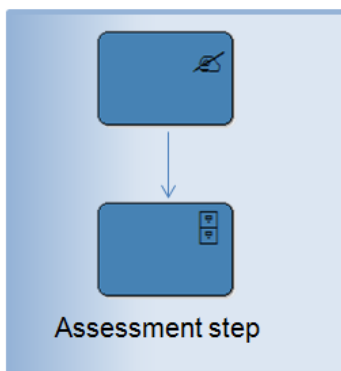
Learning progression map



Learning Activity

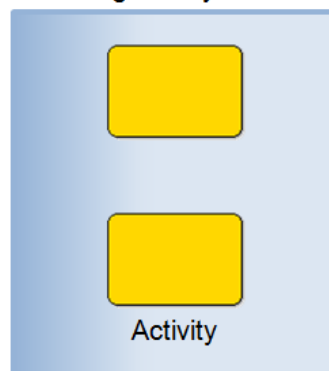
Assessment method

Assessment method model



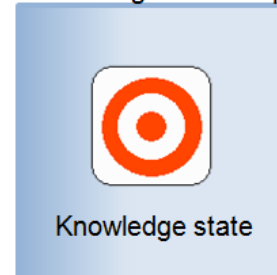
Assessment step

Learning activity model



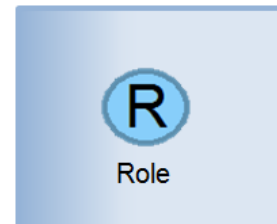
Activity

Knowledge state map



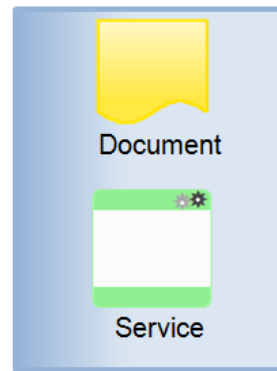
Knowledge state

Role model



Role

Resources model



Document

Service

Learning activity sequence (inclg. Assessments)



Graphical view

back to start page [Live search](#) Log out

Start Meeting skills (Paris fashion show) - ...

Create sequence element Reuse model

Released Meeting skills (Paris fashion show) - extended ecaad2 17.08.2012, 17:08:41

```
graph LR; Start(( )) --> A[Meeting introduction]; A --> B[Watch introduction]; B --> C[Analyse lessons]; C --> D[Brainstorming]; D --> E[Assessment of participation]; E --> F[Assessment of number of ideas];
```

Assessment of participation

Let library demo Base let

Description +

Activity steps (Meet) +

Competence table (Meet and Assess) +

Indicator table (Meet and Assess) +

Rule table (Meet and Assess) +

Content (details) +

Assess (details) +

Activity modeling and decision modeling

Assessment Model

Task Model

Evidence Model

Student Model



DT EvidenceRule1		
Condition		Conclusion
Individual Ideas		BSIndiv
Is	0	Failed
Within	[1;3]	Satisfying
Within	[4;7]	Good
>	7	Excellent



More on Decision Modeling

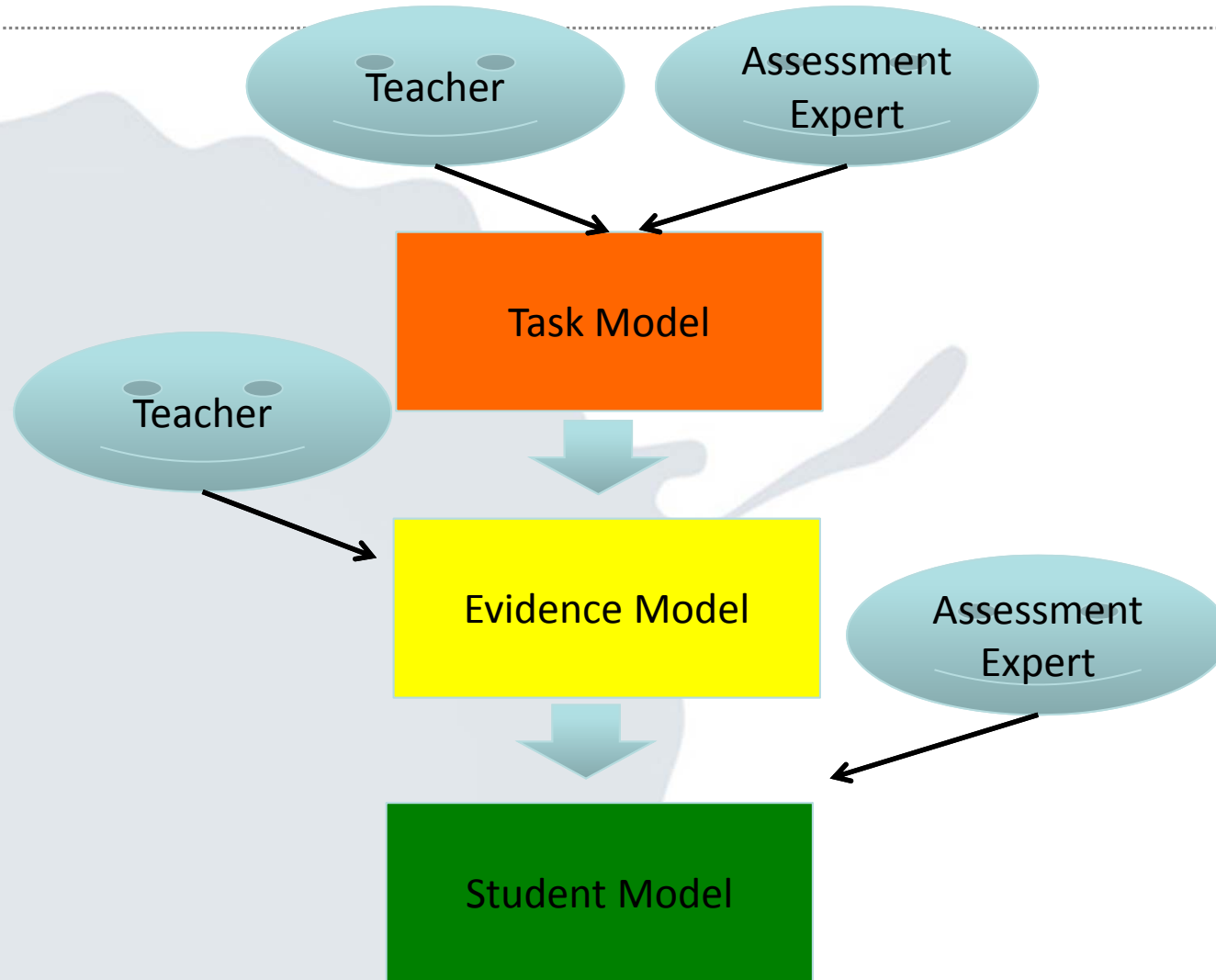
1. Artefact (and performance) appraisal (what rubrics are used for)

DT EvidenceRule1		
Condition		Conclusion
Individual Ideas		BSIndiv
Is	0	Failed
Within	[1;3]	Satisfying
Within	[4;7]	Good
>	7	Excellent

2. Learner model updating

DT LMRule1				
Condition		Condition		Conclusion
BSIndiv		Difficulty		Competency1
Is	Failed	Is	Low	-2
Is	Failed	Is	High	0
Is	Satisfying	Is	Low	1
Is	Satisfying	Is	High	2
Is	Good	Is	Low	3
Is	Good	Is	High	4
Is	Excellent	Is	Low	5
Is	Excellent	Is	High	6

Roles



First experiences with teachers

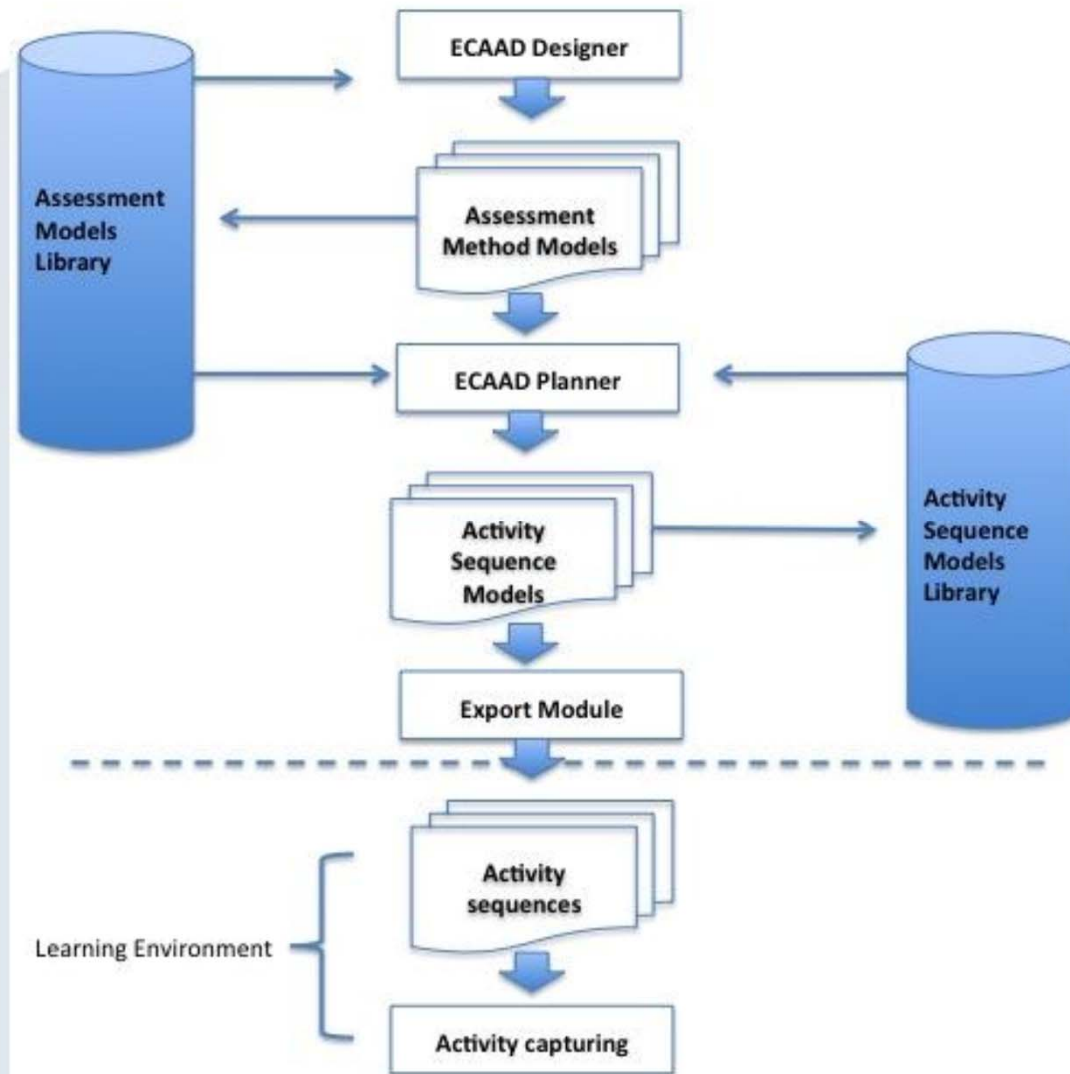


Teacher in the role of lesson planner, assessment planner, and ICT integration planner is not a feasible approach.

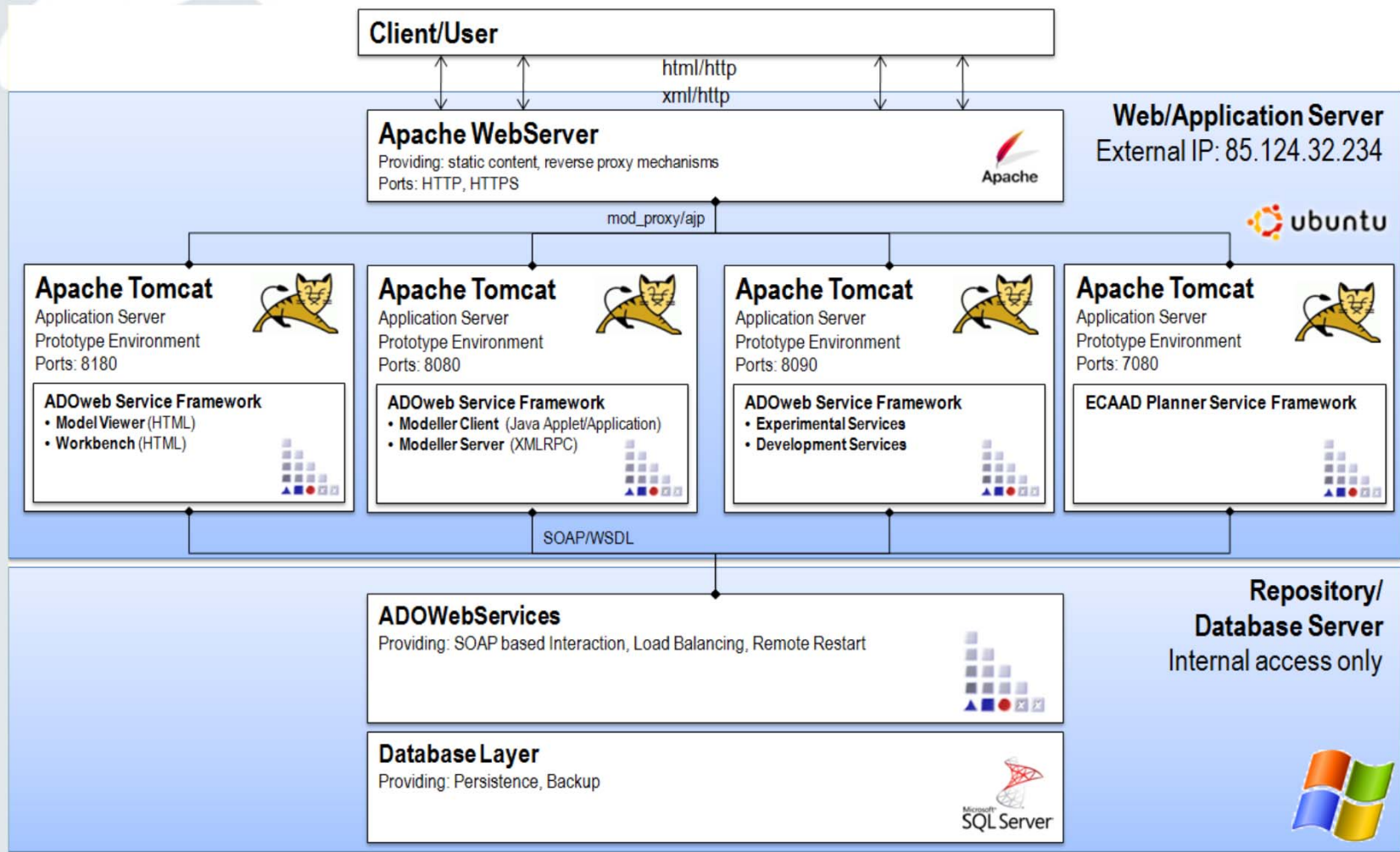
- Divide tasks based on areas of expertise into different roles;
- Design modeler as to roles
- Simplify modeling tool

Role	Functionality
Student ¹	<ul style="list-style-type: none">• search lesson
Pedagogical expert	<ul style="list-style-type: none">• create sequence• edit sequence• release and/or share• browse (and reuse) sequence• walkthrough
Assessment expert	<ul style="list-style-type: none">• edit sequence• release and/or share• browse (and reuse) sequence
Technical expert	<ul style="list-style-type: none">• browse (and reuse) sequence• parameterize• walkthrough

Model persistency



Deployment architecture for the ECAAD modeler



ECAAD modeler in action



Graphical Interface overview



Adding an activity



The model activities library

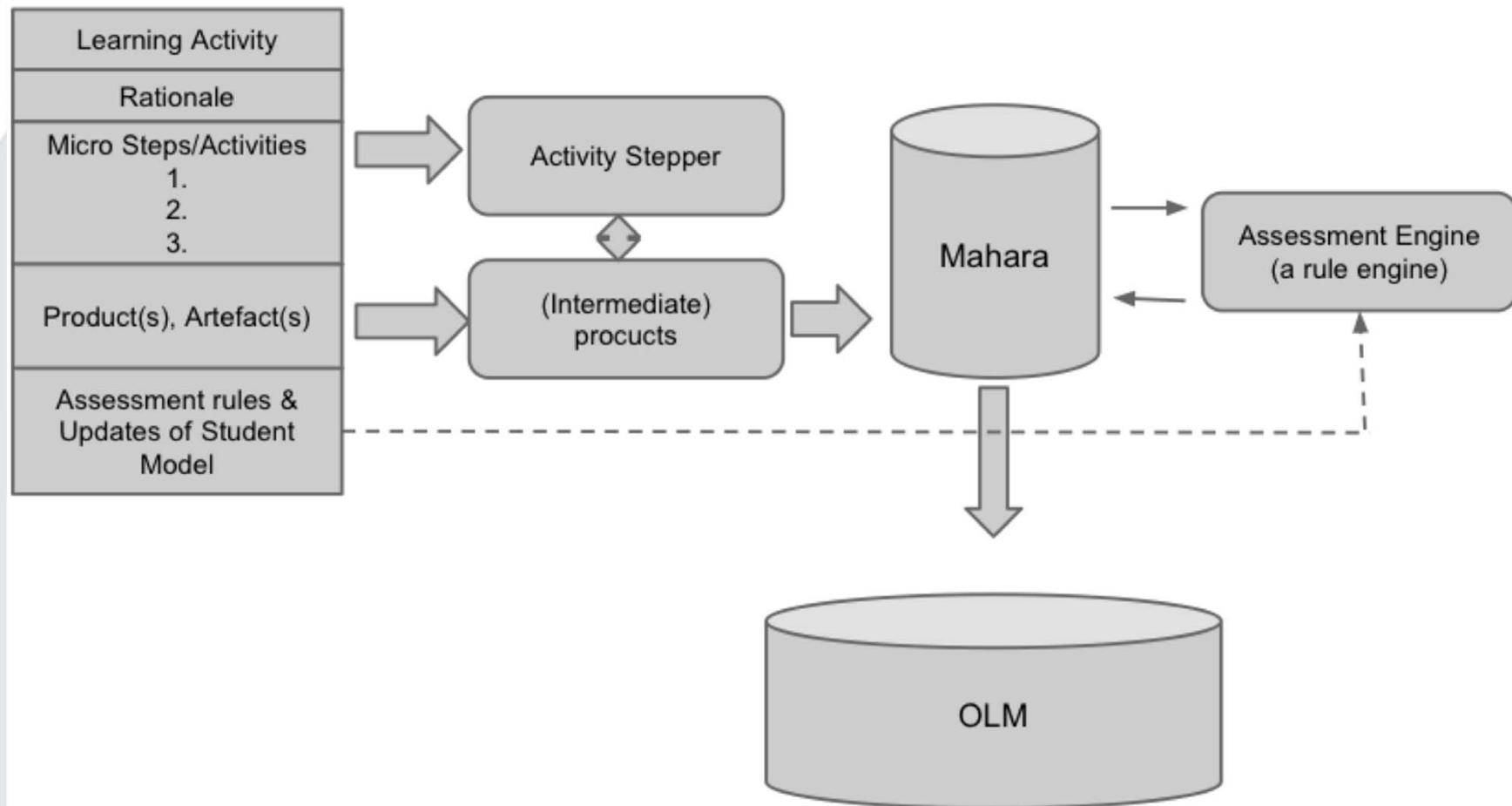


Graphical and textual model view



INTEGRATION INTO ICT-ENHANCED LEARNING ENVIRONMENTS

Integration into Learning Environment (work in progress)



Eportfolio view



Student Portal

This is what a student might present on her profile page

Profile Information

I am currently in class 7a. My hobbies are travelling and stamp collecting.



- **First Name:** Peter
- **Last Name:** Reimann

My projects:

[My writings](#)

[Pieces of Art](#)

[Student Portal](#)

[Teacher Portal](#)

My groups

[Link to team 1](#)

[Link to team 2](#)

My Reflections:

- **What I learned about agenda writing** in My Learning Journal on 12 June 2012, 12:21 PM
- **What I learned about planning a meeting** in My Learning Journal on 12 June 2012, 12:16 PM

My current learning goals

Completion date	Title	Completed
16 June 2012	Learn about different group meeting goals	
18 June 2012	How to write a meeting agenda	

2 tasks

My competencies:



Open Learner model view



Open Learner Model

eeevele.bham.ac.uk/nexttell-cas/read/browser.jsp

Home OLM Browser Add Information Subjects, Units And Activities Groups And Students Competencies

Logged in as matt_teacher (teacher) Log Out

This page shows feedback about learners' understanding.

1. Select *filter* criteria to tailor your search (e.g. group, student or activity)
2. Select a tab below to view information held for the OLM facet (e.g. knowledge level)
3. Select a *presentation* method to view the information (e.g. skill meter)

GROUP	STUDENT	SUBJECT	UNIT	ACTIVITY	COMPETENCY
Engelsk 1 ICT 1	Amy Adams Matthew Johnson	Engelsk Mathematics	Basics Communicati	Intro test Introduction Ex.	Addition (Mathematics > Addition) Kommunikasjon (Engelsk > Kommunikasjon) Subtraction (Mathematics > Subtraction) beherske et bredt ordforråd (Engelsk > Kommunikasjon > beherske et bredt ordforråd) beskrive og vurdere egen framgang i arbeidet med å lære engelsk (Engelsk > Kommunikasjon > beskrive og vurdere egen framgang i arbeidet med å lære engelsk) ta initiativ til å begynne, avslutte og holde en samtale i gang (Engelsk > Kommunikasjon > ta initiativ til å begynne, avslutte og holde en samtale i gang)

Reset All Refresh

Slider to select time period to go here

OLM Feedback Interaction

Skill Meter

Summary

Groups	Students	Subjects	Competencies
Engelsk 1	Amy Adams	Engelsk	Addition (Mathematics > Addition)
ICT 1	Matthew Johnson	Mathematics	Kommunikasjon (Engelsk > Kommunikasjon)
			Subtraction (Mathematics > Subtraction)
			beherske et bredt ordforråd (Engelsk > Kommunikasjon > beherske et bredt ordforråd)
			beskrive og vurdere egen framgang i arbeidet med å lære engelsk (Engelsk > Kommunikasjon > beskrive og vurdere egen framgang i arbeidet med å lære engelsk)
			ta initiativ til å begynne, avslutte og holde en samtale i gang (Engelsk > Kommunikasjon > ta initiativ til å begynne, avslutte og holde en samtale i gang)

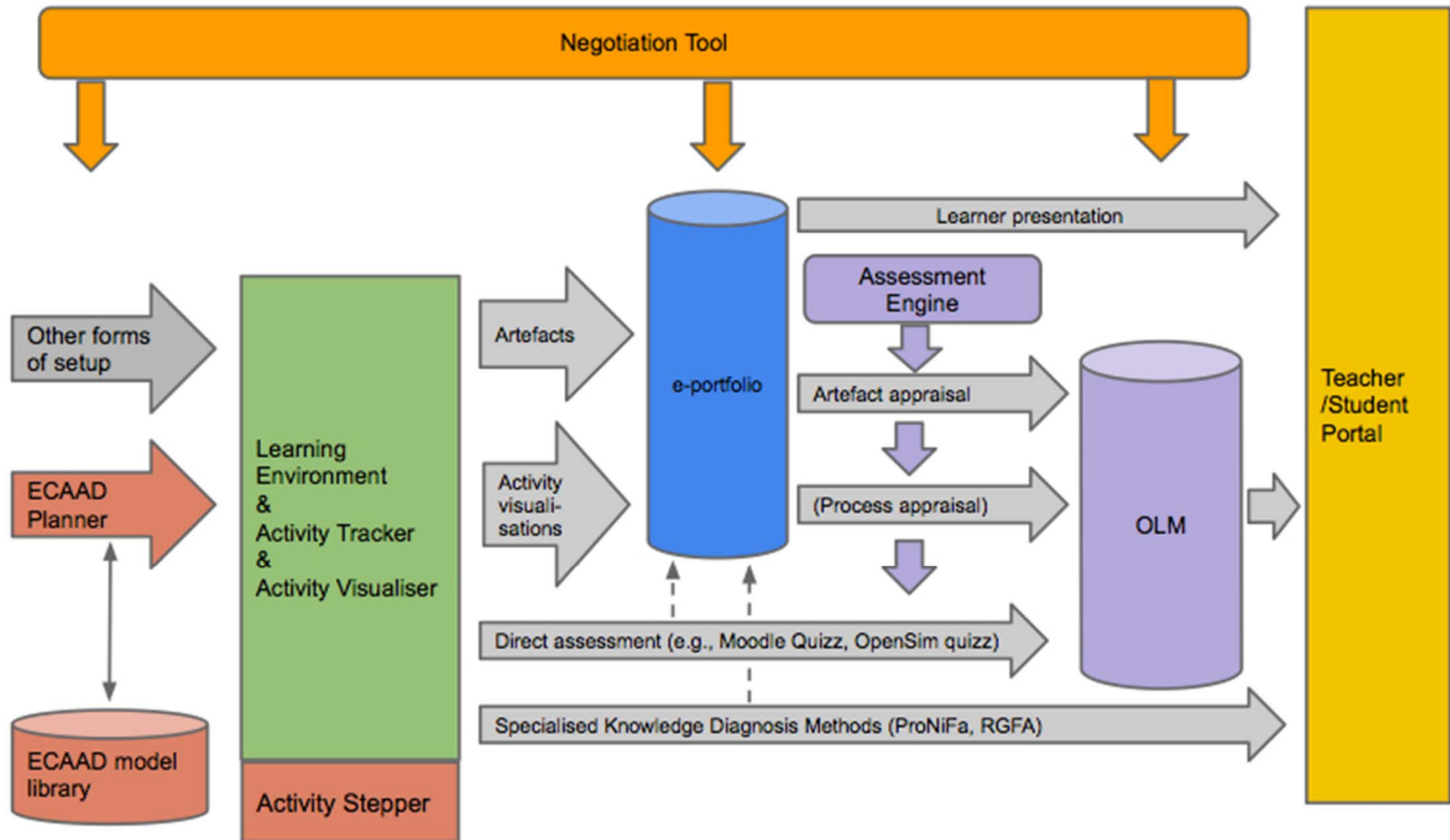
Key: correct problems no data

Table

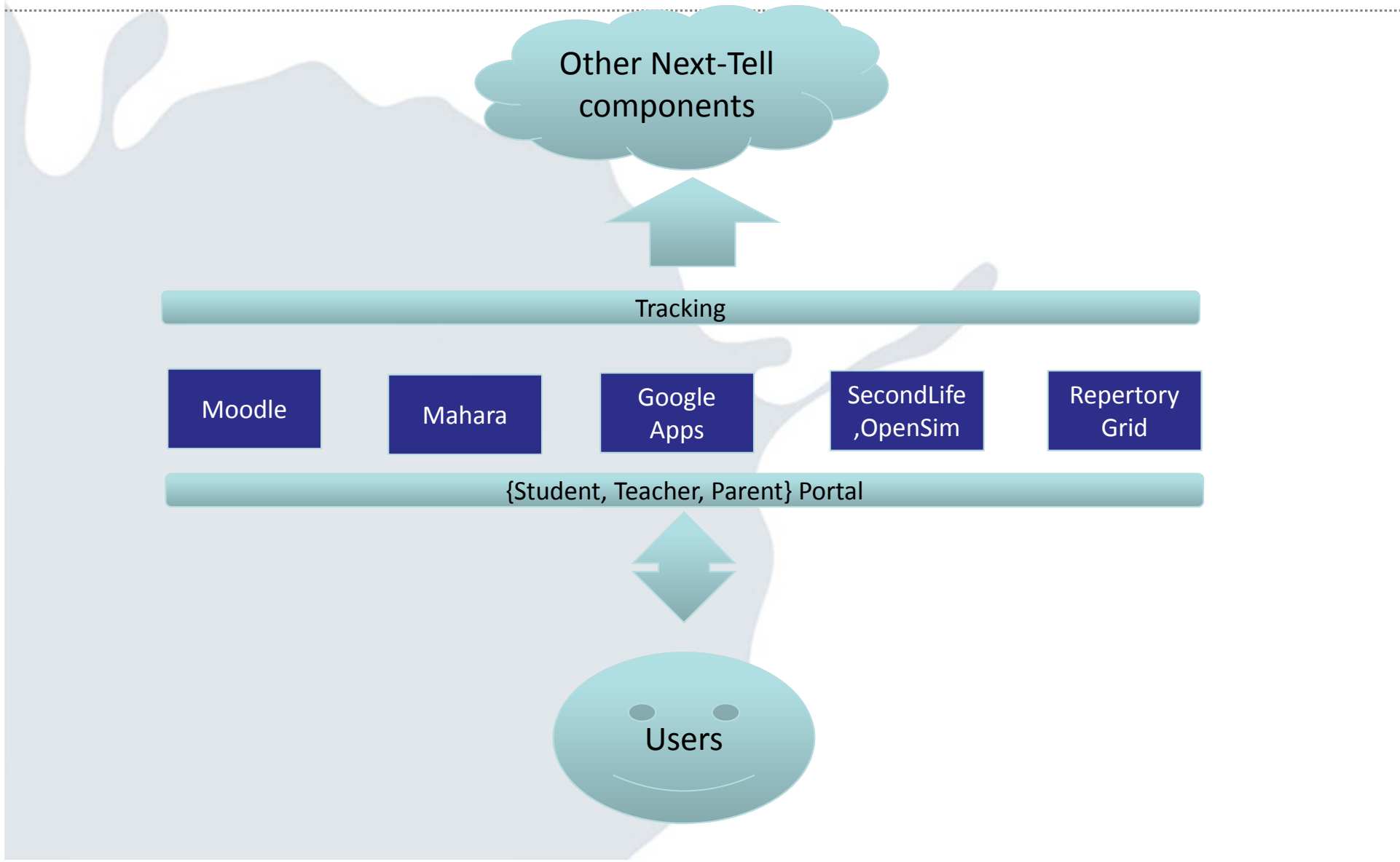
SUMMARY

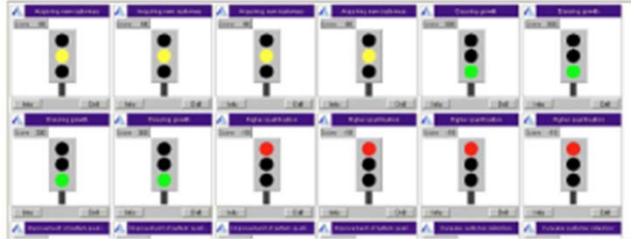
Groups	Students	Subjects	Competencies
Very Weak Weak OK Good Very Good	Very Weak Weak OK Good Very Good	Very Weak Weak OK Good Very Good	Very Weak Weak OK Good Very Good

Assessment flows



Current learning environment supported





Student information

Teacher

uses

ECAAD Method

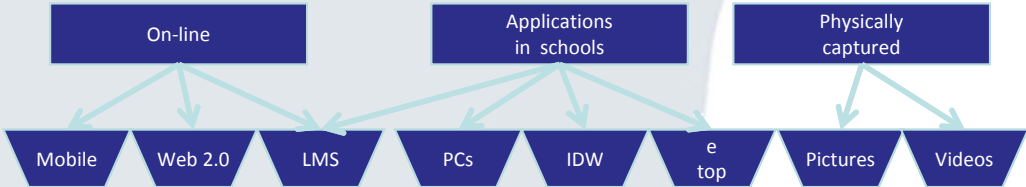
to specify

Learning Activities

and

Assessments

that get automatically* delivered to students.



Visualisation (Task Progress, OLM)

Analysis

Recording

Learning activities

*) When based on software



SHARING MODELS

Where to provide models?



www.openmodels.at



- [Member Interaction](#)
- [Knowledge Interchange](#)
- [Motivational Issues](#)



- [Modelling a Domain](#)
- [Method Development](#)
- [Extend the Meta Modelling Compiler](#)



- [Modelling Languages, Procedures](#)
- [Mechanisms & Algorithms](#)
- [Modelling Environments](#)



Some projects on openmodels.at



Showing 1 - 20 of 26 results.

Items per Page Page of 2 [First](#) [Previous](#)

Status	Name ▼	Description	Type
	ADOxx Horus Method		Restricted
	BEN	Business Engineering Navigator	Open
	BIM	Conceptual Models for Governance	Restricted
	CIDOC		Open
	Co-creation in Design Teams		Open
	ComVantage	Metamodelling for the EU Project Comvantage	Open
	COPROM		Open

Openmodels: Details of a project



eduWEAVER

eduWEAVER - A Courseware Design Tool

Eduweaver is a manangement tool for lectures


- [eduWEAVER Method Overview](#)
- [Project Details](#)
- [References](#)
- [Activities Blog](#)
- [Members](#)

eduWeaver in Use

- [Best Practise](#)
- [Modelling Sandbox](#)
- [Tutorials](#)

eduWeaver Development



 You do not have the roles required to access this portlet.

Area of application:

Eduweaver supports teachers by the individual design of courses and the distribution of high quality multimedia teaching materials among higher educational institutes. Teachers can reuse the teaching materials offered through the learning object pool of eduWeaver and do not face any more the time-consuming and non-trivial creation of multimedia applications. Further they can structure their courses according to their individual requirements and focusing on didactical guidelines.

Activities Blog:

[Geography Reference Course in Moodle](#)



February 5, 2010 3:14 PM

Let me announce the latest feature on this website. We've set up a moodle environment that visitors can see how the "geography reference course" is doing in execution. The two steps to get useable toolcontents are

- creation of the course in the modelling environment
- import of the models into your execution environment (e.g. moodle)

The execution environment has to follow the standards of IMS Learning Design and / or SCORM.

Search

Openmodels: Meta model browser



Metamodel-Browser

Home Model-Browser

Metamodels

- Copy1ofiSTARMethod_v1.05.
- Copy2ofiSTARMethod_v1.05.
- ISTAR Method_v1.05.xml

Elements

ID	Element
19	__ModelTypeMetaData
20	__LibraryMetaData__
21	Note
22	ISTAR

Diagram-Board

Elements

Abstract Metaconstructs

__LibraryMetaData__ __ISTAR__ __Person__ __WE_resource__ __WE_Contalner__

Concrete Metaconstructs

RootClass Note __Intentional Actor__ Actor Agent

Attributes Selected Element with Relations

The NEXT-TELL consortium

www.next-tell.eu

