Learning Analytics
at the Welten Institute’s TELI Group

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Learning Analytics

Pic. by Tom Raftery: [http://www.flickr.com/photos/traftery/4773457853](http://www.flickr.com/photos/traftery/4773457853)
Structure

Why LA?
LA Framework
LA Research at TELI
EVS Widget & EFLA
Discussion
More ICT = More Data

these data are valuable and informative

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The Big Data Economy

WE'RE SO PREDICTABLE

An algorithm can predict human behavior better than humans

learning analytics = data science for education
What Are Educational Data?

- DATA from Learning Profiles
- DATA from LMS and MOOCs
- DATA from Learning Resources (Apps, Games,..)

we can now follow students in their learning processes

– on demand learning measures –
– on demand learning support –
Structure

Why LA?

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Discussion
Data Collection, Storage & Analysis – xAPI

LEARNING IS HAPPENING EVERYWHERE.
PEOPLE LEARN IN MANY PLACES, DOING MANY THINGS.

COLLECT THE EXPERIENCES THAT MATTER.
THIS API RECORDS ACTIVITIES AND DELIVERS DATA THAT IS:
• QUANTIFIABLE
• SHARABLE
• TRACKABLE

THE ACTIVITIES

THE LEARNER

THE TOOLS

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https://tincanapi.com/overview/

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Data Collection, Storage & Analysis – xAPI

ECO – xAPI Infrastructure

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ECO – Dashboard

Dashboard for teachers

Resources consumed by you in this course

All your activities in ECO (regardless of the course)

Your performance compared to the average performance
LACE – Learning Pulse

LACE – Learning Pulse

Flow points for ARLearn7

Flow diagram (source: wikipedia.org/wiki/Flow_(psychology))

High Anxiety Arousal Flow
High Worry Control
Low Apathy Boredom Relaxation

Flow points for ARLearn7

 actividad What was the main activity in the chosen timeframe?
• Reading
• Writing
• Meeting (online, offline)
• Communicating (email, chat)
• Other (lunch, gaming, ...)

productivity How productive were you?

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flow diagram bottom left: https://en.wikipedia.org/wiki/File:Challenge_vs_skill.svg
Learner accesses a task
Learner accesses assignment
Learner accesses assessment
Learner accesses peer assessment
Learner accesses peer product
Learner accesses learning resource
Learner accesses forum
Learner accesses blog
Learner accesses blog page
Learner accesses individual blogpost
Learner accesses wiki
Learner accesses wiki page
Learner accesses game
Learner accesses activity stream
Learner uploads assignment product
Learner attempts assessment
Learner post new forum thread
Learner replies to forum message
Learner posts blogpost
Learner comments on blogpost
Learner creates wiki page
Learner follows user
Learner follows activity stream
Learner follows RSS feed
Learner joins a group
Learner leaves a group
Learner liked resource
Learner liked blog post
Learner liked forum message
Learner liked tweet
Learner listens to audio
Learner listens to podcast
Learner added friend
Learner watches video

Learner accesses assessment

```
curl -H "Content-Type:application/json" -H "X-Experience-API-Version:1.0.0" -u "3e77d217c66e25b5e75ba4dd2abe610cee967f33:0e88ec851341584b8eb8322135d039ad01e14c6d"
http://sharetec.cellstec.org/learninglocker/public/data/xAPI/statements -d \\
{
    "actor": {
        "objectType": "Agent",
        "account": {
            "homePage": "https://portal.ecolearning.eu/user=5493fa84cd35f8064e81bcfd",
            "name": "5493fa84cd35f8064e81bcfd"
        }
    },
    "verb": {
        "id": "http://activitystream.ms/schema/1.0/access",
        "display": {
            "en-US": "Indicates the learner accessed something"
        }
    }
},

"object": {
    "objectType": "Activity",
    "id": "http://eco/assessmentXZY.html",
    "definition": {
        "name": {
            "en-US": "Assessment XZY"
        },
        "description": {
            "en-US": "This is an assessment about XYZ"
        }
    },
    "type": "http://adlnet.gov/expapi/activities/assessment"
},
"timestamp": "2015-06-01T08:30:48Z"
}``
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LASER – Group Awareness Support

LACE – Evaluation Framework for Learning Analytics

1. Data: open access
2. Data: privacy
3. Acceptance & uptake
4. Learning outcome
5. Teacher awareness
6. Learning performance
7. Learning support
8. Student awareness


LACE – Evaluation Framework for Learning Analytics


LACE – Evaluation Framework for Learning Analytics

Objectives
- Awareness
- Reflection
- Motivation
- Behavioural Change

Learning Support
- Perceived Usefulness
- Recommendation
- Activity Classification
- Detection of Students at Risk

Learning Measures and Output
- Comparability
- Effectiveness
- Efficiency
- Helpfulness

Data Aspects
- Transparency
- Data Standards
- Data Ownership
- Privacy

Organisational Aspects
- Availability
- Implementation
- Training of Educational Stakeholders
- Organisational Change

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http://www.laceproject.eu/evaluation-framework-for-la/
## LACE – Evaluation Framework for Learning Analytics

<table>
<thead>
<tr>
<th>Learners</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Aspects</strong></td>
<td></td>
</tr>
<tr>
<td>I know what data is being collected</td>
<td>I know what data is being collected</td>
</tr>
<tr>
<td>I have access to my data</td>
<td>I have access to my students’ data</td>
</tr>
<tr>
<td>I understand the presented results</td>
<td>I understand the presented results</td>
</tr>
<tr>
<td><strong>Awareness</strong></td>
<td></td>
</tr>
<tr>
<td>I am aware of my current learning status</td>
<td>I am aware of my students’ current learning status</td>
</tr>
<tr>
<td>I comprehend my current learning status</td>
<td>I comprehend my students’ current learning status</td>
</tr>
<tr>
<td>I can project my future learning status</td>
<td>I can project my students’ future learning status</td>
</tr>
<tr>
<td><strong>Reflection</strong></td>
<td></td>
</tr>
<tr>
<td>I reflect on my learning activities</td>
<td>I reflect on my teaching activities</td>
</tr>
<tr>
<td>I reflect on alternative learning activities</td>
<td>I reflect on alternative teaching activities</td>
</tr>
<tr>
<td>I know when to change my behavior</td>
<td>I know when to change my behavior</td>
</tr>
<tr>
<td><strong>Impact</strong></td>
<td></td>
</tr>
<tr>
<td>I can detect whether I am falling behind</td>
<td>I can detect whether my students are falling behind</td>
</tr>
<tr>
<td>I study more efficiently</td>
<td>My students learn more efficiently</td>
</tr>
<tr>
<td>I study more effectively</td>
<td>My students learn more effectively</td>
</tr>
</tbody>
</table>
Discussion
Contact Information

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           http://slideshare.com/Drachsler