Confidence in Learning Analytics
Understandings and Expectations from the Stakeholders

Confidence in Learning Analytics
Understandings and Expectations from the Stakeholders

Competences
- Critical thinking
- Interpretation

Constraints
- Privacy
- Ethics

Stakeholders
- Institutions
- Teachers
- Learners
- Parents

Learning Analytics

Technologies
- EDM
- RecSys
- Statistical Analysis

Reflection
- Prediction
- Open
- Protected

Objectives
- Educational Data

Centre for Learning Sciences and Technologies
Hendrik Drachsler & Wolfgang Greller
LAK12, Vancouver, Canada, 30th April 2012
Goals of the Presentation

- LA Framework
- Survey
- Findings
- Conclusions
A view on Learning Analytics

The Learning Analytics Framework
Stakeholders vs. LA Framework

Opinions from the stakeholders toward the dimensions of the LA framework
Extrapolate opinions from different target groups:

(a) what is the current understandings and the expectations on LA

(b) is there a common understanding of LA
Learning Analytics Questionnaire

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 12 minutes 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 of six key dimensions (outer circle) and related sub-domains (inner circle).


- 4 weeks available
- 156 people after clean up
- 121 people full records
Participants

- Higher Education: 74.8%
- K-12: 8.4%
- Vocational: 11.0%
- Others: 5.8%
Participants - Roles

- Teachers: 44%
- Researchers: 36%
- L.Designers: 26%
- Managers: 16%
Participants - Reach

Responses from 31 countries [UK (38), US (30), NL (22)]
Stakeholders

data

subjects

data

clients
Stakeholders

(a) who was expected to benefit the most from learning analytics
Stakeholders

(a) who was expected to benefit the most from learning analytics

Outcomes:
1. Teachers
2. Learners
3. Institutions
4. Parents

- Teachers
- Parents
- Institutions
- Learners
Stakeholders

(b) how much will learning analytics influence bilateral relationships?

- Teachers
- Parents
- Institutions
- Learners
Stakeholders

(b) how much will learning analytics influence bilateral relationships?

Outcomes:
1. Teacher-student 84%
2. Student-teacher 63%
3. Student-student 46%
4. Teacher-teacher 41%

- Teachers
- Parents
- Institutions
- Learners
Objectives

Reflection

(Glahn, 2009)
Objectives

Reflection  Prediction

(Glahn, 2009)
Objectives

The importance of 3 generic objectives:

(a) reflection
(b) prediction
(c) unveil hidden information
Objectives

In which way learning analytics will change educational practice in particular areas?

\[ n = 119 \]

11% no changes at all
43% small changes
45% extensive changes
Objectives

In which way learning analytics will change educational practice in particular areas?

Item 2: Timely information about learning

Item 8: Better insights by institutions in their courses

Item 5: Easier grading

Item 6: Objective assessment
# Educational Data

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# Educational Data

<table>
<thead>
<tr>
<th>Answer</th>
<th>Response</th>
<th>%</th>
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<tbody>
<tr>
<td>Learning management system (e.g., Blackboard, Moodle)</td>
<td>111</td>
<td>89%</td>
</tr>
<tr>
<td>Student information system</td>
<td>73</td>
<td>58%</td>
</tr>
<tr>
<td>External services (e.g., Google docs, Facebook, Twitter, slideshare, iTunes U)</td>
<td>64</td>
<td>51%</td>
</tr>
<tr>
<td>Intranet</td>
<td>55</td>
<td>44%</td>
</tr>
<tr>
<td>Wiki platform</td>
<td>47</td>
<td>38%</td>
</tr>
<tr>
<td>Course management system</td>
<td>45</td>
<td>36%</td>
</tr>
<tr>
<td>Social networking platform</td>
<td>44</td>
<td>35%</td>
</tr>
<tr>
<td>E-portfolio system (e.g., Mahara)</td>
<td>42</td>
<td>34%</td>
</tr>
<tr>
<td>Mobile platform (e.g., Apps, e-books)</td>
<td>36</td>
<td>29%</td>
</tr>
<tr>
<td>other (please specify)</td>
<td>8</td>
<td>6%</td>
</tr>
<tr>
<td>Sensor data (e.g., location data)</td>
<td>5</td>
<td>4%</td>
</tr>
</tbody>
</table>

**Researcher:**
1. Added context information  
   (n=43, means 3.42)

**Teacher:**
1. Added context information  
   (n=52, means 3.42)

**Manager:**
1. Sharing within the institution  
   (n=16, means 3.63)  
2. Anonymisation  
   (n=19, means 3.53)
Technologies

Technologies

Prediction

Technologies

Reflection


Technologies

Trust in accurate and appropriate LA results ...

1. View on learning progress
2. Predict learning resource
3. Assessment
4. View on engagement
5. Compare learners
6. Prediction of peers
7. Prediction of learner performance
Constraints

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

Effect size of LA on ...

- Privacy: 44 (not at all), 42 (a little), 46 (very much)
- Ethics: 9 (not at all), 47 (a little), 1 (very much)
- Data ownership: 6 (not at all), 30 (a little), 71 (very much)
- Data openness: 4 (not at all), 36 (a little), 68 (very much)
- Transparency: 6 (not at all), 37 (a little), 68 (very much)
Competences
Competences

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

1. Numerical skills
2. IT literacy
3. Critical reflection
4. Evaluation skills
5. Ethical thinking
6. Analytical skills
7. Self-directedness
Competences

Item 1: Numerical skills
Item 3: Critical reflection
Item 5: Ethical thinking
Item 7: Self-directedness
70.2% (n=85) believed that learners were NOT competent enough to independently learn from learning analytics.
Limitations
Limitations

1. Dominance of responses from the HE sector

2. Absence of students

3. Low awareness of LA; Only surveyed innovators and early adopters

4. Mainly opinions from western cultures
Survey summary

Main findings of the survey according to the LA framework
1. Main beneficiaries of LA are learners and teachers followed by organisations.

2. Biggest benefits would be gained in the teacher-to-student relationship.

3. Learners require teacher support to learn from LA.
Stakeholders

1. Main beneficiaries of LA are learners and teachers followed by organisations.

2. Biggest benefits would be gained in the teacher-to-student relationship.

3. Learners require teacher support to learn from LA.
1. Reflection support is main objective from the stakeholders view ...
2. ...by revealing hidden information about learners
Objectives

1. Reflection support is main objective from the stakeholders view ...
2. ...by revealing hidden information about learners

Reflection support only for teacher student relationship?
1. Context information from learners and the learning process

2. Anonymisation is the second most important data attribute

3. Willingness to share if data is anonymised
1. Context information from learners and the learning process

2. Anonymisation is the second most important data attribute

3. Willingness to share if data is anonymised

Can we achieve a collection of reference datasets?
1. Trust in LA algorithms is not well developed

2. High confidence on gaining a comprehensive view of the learning progress
1. Trust in LA algorithms is not well developed

2. High confidence on gaining a comprehensive view of the learning progress

How accurate can we measure a learning progress?
1. Data ownership is the most important topic

2. LA lead to breaches of privacy but privacy and ethical aspects are of lesser importance

3. Many organisations have ethical boards and guidelines in place
1. Data ownership is the most important topic

2. LA lead to breaches of privacy but privacy and ethical aspects are of lesser importance

3. Many organisations have ethical boards and guidelines in place

Do we need new policies for data ownership and privacy?
1. Skepticism that LA will lead to more independence of learners to control their learning process

2. Training need to guide students to more self-directedness and critical reflection
1. Skepticism that LA will lead to more independence of learners to control their learning process

2. Training need to guide students to more self-directedness and critical reflection

**Do we need mandatory courses on statistics for the edu. sector?**
Future R&D

picture by Tom Raftery

http://www.flickr.com/photos/traftery/4773457853
Future R&D

1. Encourage the LA community to gain additional insights from our dataset: http://bit.ly/la_survey

2. Look for partners to survey public bodies like school foundations and governmental institutions

3. Compare LA in different educational cultures and extend survey to eastern countries
Future R&D

Group Concept Mapping

to identify consensus about particular issues in learning analytics
Many Thanks::Questions?

This presentation is available at:
slideshare.com/Drachsler

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Supporting projects: