Analytics - an agent for change

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Business Development

#mootgr18
@ghenrick
But first...
Our Mission

Empowering educators to improve our world
Our Vision

To give the world the most effective platform for learning
4 QUALITY EDUCATION
Registered: 106K sites, 140M users
moodle.net/stat
Our Values

Education  Openness

Integrity  Respect

Innovation
Education is the foundation of making the world a better place. We are always learning, improving how we learn, and seeing the education potential in every situation.
We strive to be open in our goals, our tools, our processes and our results, as much as is practical. Everyone should be able to communicate freely and inclusively.
Respect

We treat everyone with respect and sensitivity, recognising the importance of their contributions: team members, teachers, students, customers, partners, suppliers and competitors.
Integrity

We employ the highest ethical standards, demonstrating honesty and fairness in every action that we take. Say what you’ll do, and do what you say.
Innovation

Encourage a culture where everyone has opportunities to make new things and take risks, and share that with others.
Sustainability
Why “educators”?

We respect *educators* and we want them to innovate locally.
So Analytics...

How does this all mean? How does it apply to and support educators?
Learning analytics: What is it?
What is Learning Analytics?
Learning analytics is 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.
- Wikipedia
What is Learning Analytics?

Field associated with **deciphering trends and patterns** from educational big data, or huge sets of student-related data, to further the **advancement of a personalized, supportive system** of higher education. - 2013 Horizon Report
What is report without action?
We already have this data available to us in various formats, and some reports.

There are many great report plugins and integrations available for Moodle.

But what happens to them? Who looks? Who decides to act? Who acts?
Descriptive Analytics

What has happened?
Diagnostic Analytics

Why has this happened?
Predictive Analytics

What will happen?
Prescriptive Analytics

What should happen?
What will happen when something is identified?
Some types of interventions / feedback

- Academic Mentor
- Student services engagement
- Counselling
- Coaching
- Tutoring
- Mentoring
- Nudging
A nudge - indirect message to change behaviour
<table>
<thead>
<tr>
<th>Plan</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SalesforceIQ CRM Starter</td>
<td>Out-of-the-box CRM for up to 5 users</td>
<td>$25 (USD/user/month*)</td>
</tr>
<tr>
<td>Lightning Professional</td>
<td>Complete CRM for any size team</td>
<td>$75 (USD/user/month*)</td>
</tr>
<tr>
<td>Lightning Enterprise</td>
<td>Deeply customizable sales for your business</td>
<td>$150 (USD/user/month*)</td>
</tr>
</tbody>
</table>

Most popular plan:

- **Trying for free LEARN MORE**
- **BUY NOW FREE TRIAL For 30 days**

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**Independent Contractors**

- **SELF-EMPLOYED**
  - $10/mo
  - **UP TO 50% OFF FOR 6 MONTHS**
  - Buy now

- **SIMPLE START**
  - $15/mo
  - Buy now

- **ESSENTIALS**
  - $35/mo
  - Buy now

- **PLUS**
  - $50/mo
  - Buy now
Ballot Bin
Voting with cigarette stubs
Lucerne, Switzerland Gets Cleaned Up in a Playful Manner
housefly painted onto the ceramic of a urinal in a men's public toilet
Nudges in Gmail
Kissing Point Safely
Selfie Spot
Helena
Montana
| Taloons.com removed social sharing buttons from its product pages. This increased add to carts by 11.9% |

![Visual Website Optimizer](image-url)
Nudge Example from not in education
A Practitioner’s Guide To
Nudging

Kim Ly, Nina Mažar, Min Zhao and Dilip Soman

15 March, 2013

Elizabeth Lyons and Julian House contributed research and analysis to this report.
<table>
<thead>
<tr>
<th>ACTIVATING A DESIRED BEHAVIOUR</th>
<th>MINDFUL</th>
<th>MINDLESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXTERNALLY-IMPOSED</td>
<td>ENCOURAGE</td>
<td>DISCOURAGE</td>
</tr>
<tr>
<td>Simplifying tax rules to make tax filing easier.</td>
<td>Placing signs to remind people not to litter.</td>
<td>Advertising that most people are recycling to increase recycling efforts.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BOOSTING SELF-CONTROL</th>
<th>MINDFUL</th>
<th>MINDLESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXTERNALLY-IMPOSED</td>
<td>ENCOURAGE</td>
<td>DISCOURAGE</td>
</tr>
<tr>
<td>Simplifying application processes for college grants to encourage higher-level education.</td>
<td>Installing car dashboards that track mileage to reduce gas usage.</td>
<td>Automatically enrolling for prescription refills to encourage taking medication.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SELF-IMPOSED</th>
<th>MINDFUL</th>
<th>MINDLESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENCOURAGE</td>
<td>DISCOURAGE</td>
<td>ENCOURAGE</td>
</tr>
<tr>
<td>Maintaining an exercise routine by agreeing to pay a small penalty if a gym session is missed.</td>
<td>Avoiding drunk driving by hiring a limo service beforehand.</td>
<td>Joining a peer savings group to encourage saving money.</td>
</tr>
</tbody>
</table>
Nudge development process

1. Map the context
2. Understand the decision making process
3. Determine the main heuristics and influences
4. Experiment and iterate
   - Prioritise nudges and test for effectiveness
5. Select the nudge
6. Identify suitable nudges
7. Identify the levers for nudging
8. Identify possible constraints and where nudges can be implemented
How can nudges be implemented in education?
Example in note taking watching a video

From a study in Canterbury NZ
Identified different styles of engagement
Found opportunities for interventions
Prediction model was developed
A framework of interactive personalised nudges was created

http://dx.doi.org/10.1145/3079628.3079683
Recent presentation at ASCILITE 2018

Keeping everyone OnTask: Gauging the impact of personalised feedback through academic case studies

3 short cases studies

Case 1: OnTask for Student Engagement

The inclusion of the OnTask email being sent to students 3 days prior to the closing date of the quiz in 2018 led to an additional 47.4% of the class completing the quiz.

Case 2: OnTask for large classes

Needed to assist in personalising feedback for large classes (200-600)

Using the system allowed the identification of specific trigger points at which feedback can be sent to students to prompt them to take appropriate action.
Case 3 : OnTask for Student Wellbeing

Study discussed the inclusion of OnTask interventions assessing student wellbeing as an emotional state of mind.

Questionnaire will allow students the opportunity to self-assess

A response will offer understanding and supportive acknowledgement ... and suggestions or techniques to return to a balanced position in the flow.
Text 'nudges' boost engagement for community college STEM students

Text message reminders and answers to students' questions reduced the summer melt rate by 22%.

The value of a nudge

The students were sent nudges regarding due dates, study habits, stresses and staying focused.

“We typically find that 60-70% of these students will return texts that ask them questions. “

https://www.tacoma.uw.edu/teaching-learning-technology/pplus
<table>
<thead>
<tr>
<th>Target</th>
<th>Enabled</th>
<th>Indicators</th>
<th>Time splitting</th>
<th>Insights</th>
<th>Actions</th>
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</thead>
<tbody>
<tr>
<td>No teaching</td>
<td>✔️</td>
<td>• There are no teachers</td>
<td>Single range</td>
<td>Choose...</td>
<td>Actions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• There are no students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students at risk of dropping out</td>
<td>✔️</td>
<td>• Course accessed after end date</td>
<td>Quarters accumulative</td>
<td>Choose...</td>
<td>Actions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Course accessed before start date</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Any write action</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Read actions amount</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>• Assignment cognitive</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>• Assignment social</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>• Book reading</td>
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Moodle Learning Analytics Working Group

- Open Source: No proprietary algorithms
- Open Access: Anonymized Data Exchange
- Open Research: All can participate in posing questions and seeking answers

Visit https://moodle.org/analytics !
Current features

- Two built-in prediction models: "Students at risk of dropping out" and "No Teaching". A set of student engagement indicators based on the Community of Inquiry.
- Built-in tools to evaluate models against your site's data
- Proactive notifications for instructors using Events Instructors can easily send messages to students identified by the model
- Machine learning backend plugin type
Students at risk of dropping out

**Prediction:** Student at risk of dropping out

<table>
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</thead>
<tbody>
<tr>
<td>Nannie Hussain</td>
<td><img src="#" alt="send message" /> <img src="#" alt="view prediction details" /> <img src="#" alt="acknowledged" /> <img src="#" alt="not useful" /></td>
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<tr>
<td>Mariano Hernandez</td>
<td><img src="#" alt="send message" /> <img src="#" alt="outline report" /> <img src="#" alt="view prediction details" /> <img src="#" alt="acknowledged" /> <img src="#" alt="not useful" /></td>
</tr>
<tr>
<td>Carmella Carandang</td>
<td><img src="#" alt="send message" /> <img src="#" alt="view prediction details" /> <img src="#" alt="acknowledged" /> <img src="#" alt="not useful" /></td>
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<td>Barbara Bhardwaj</td>
<td><img src="#" alt="send message" /> <img src="#" alt="view prediction details" /> <img src="#" alt="acknowledged" /> <img src="#" alt="not useful" /></td>
</tr>
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Current limitations

- Models included in this release must be "trained" on a site with previous completed courses, ideally using the Moodle course completion feature. The current models cannot make predictions on a site until this is done.
  The prediction model included with this version requires that courses have fixed start and end dates.
  Models and predictions are only visible to teachers and administrators at present.
Use Moodle for Research

- Use the data-rich Moodle platform for your study
- Create plugins to implement new structures
- **Share** plugins to collect more data and reviews
- Join in our Moodle Inspire analytics initiative.

Visit [research.moodle.net](http://research.moodle.net)!
https://www.jisc.ac.uk/sites/default/files/how_do_you_decide WHETHER_to_intervene_with_students_based_on_their_learning_analytics_transcript.pdf
https://oro.open.ac.uk/34330/1/LAK12-DougClow-personalcopy.pdf
http://2018conference.ascilite.org/conference-proceedings/
https://www.slideshare.net/dougclow/the-learning-analytics-cycle-closing-the-loop-effectively


Using Learning Analytics to Devise Interactive Personalised Nudges for Active Video Watching
https://ir.canterbury.ac.nz/bitstream/handle/10092/14529/AVWS-UMAP2017-final.pdf?sequence=2

A Practitioner’s Guide To Nudging Kim Ly, Nina Mažar, Min Zhao and Dilip Soman