Toward the development of a dynamic dashboard for FutureLearn MOOCs: insights and directions

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The purpose of dashboards

Dashboards are only useful if there are actionable insights!

• Learner activity
• Learner engagement
• Learner experience

✓ Effectiveness of learning design > informing redesign
Two epicycles of analytics

Institutional level, QA/QE

Collect -> Refine

Course level in FL

Act -> Refine

Predict

Report

To ‘mainstream’
Why another dashboard?

• Over the past year UNSW developed and delivered around 20 MOOCs in FutureLearn platform.

• FutureLearn decided not to offer a fully-fledged dashboard to partner institutions but a static report.

• The granularity of the information does not necessarily cater to the needs of all the different stakeholders.

• Taking advantage of the near real-time release of data by FutureLearn.
How MOOCs publish in FutureLearn

Weeks

1. **WEEK 1**
   - 12 Oct
   - **WEEK 1: DIRECT PROPORTIONS AND THE GEOMETRY OF LINES**

   **How to take this course**
   Let’s start with a brief orientation to how to progress through the course, what you shall need, etc. We will give you some tips and suggestions to help you on your way, but remember — it is your course.

2. **WEEK 2**
   - 19 Oct

3. **WEEK 3**
   - 26 Oct

4. **WEEK 4**
   - 2 Nov

**Step Type**

- **1.1 WELCOME AND ORIENTATION ARTICLE**

- **1.2 DIRECT PROPORTIONALITY VIDEO (02:12)**

- **1.3 DIRECT PROPORTIONALITIES FROM DAILY LIFE ARTICLE**
What data we get

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<th>TITLE</th>
<th>START DATE</th>
<th>ACTIONS</th>
</tr>
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<td>UPCOMING</td>
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<td>World War 1: Lessons and Legacy of the Great War</td>
<td>8 Feb 2016</td>
<td>FINISHED</td>
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Datasets

- Campaigns 16.4 KB last updated 7 Nov 2016
- Comments 4.47 MB last updated 23 Oct 2016
- Enrolments 584 KB last updated 7 Nov 2016
- Question Response 3.56 MB last updated 23 Oct 2016
- Step Activity 4.89 MB last updated 23 Oct 2016
- Team Members 762 Bytes last updated 7 Nov 2016
How we can automate

FutureLearn Website

AWS MySQL

AWS Apache Server

Data Extraction and pre-processing

Pre-processing routines: To prepare data for visualizations

Dashboard Development

Shiny app platform: To present visualizations
Data Extraction and Pre-processing of Data

- Python scripts were used to automatically login into the FutureLearn platform and download all available files for each course.
- R scripts have the pre-processing routines to prepare the data for the web application and transform the source tables into smaller views, used for individual representations.
Exploring different types of visualisations – Heatmap

Step Activity Progress by Week

This chart shows the heatmap of step activity vs week. The Coloring is based on the number of learners who visited the step at the given week.
Exploring different types of visualisations – Sankey
Exploring different types of visualisations – Transition Network
Exploring different types of visualisations - Highstock
Exploring different types of visualisations – Sentiment Barchart
Conclusion and Future Work

• *Automating* the development of an analytics dashboard for the FutureLearn platform

• Our implementation provides an opportunity to consider possible ways to use the tool with both educators and students.

• In the future,
  – Experimentally test the effectiveness of visualisations with stakeholders (learners and staff)
  – Cautiously increase sophistication
CALL FOR CONTRIBUTIONS (http://bit.ly/FLW_LAK17)

1st FutureLearn data Workshop: What we currently have, what we are learning and how it is demonstrating learning in MOOCs

Lorenzo Vigentini (UNSW, Australia), Manuel León Urrutia (University of Southampton, UK), Ben Fields (FutureLearn)

Upcoming Workshop on FutureLearn Analytics at LAK 2017 (Mar 13-17, 2017, Vancouver, Canada).

Submissions (short papers 5 pages, long paper 10 pages using ACM format) will be collected in a proceedings volume in the http://ceur-ws.org online archive.

The organisers welcome contributions focusing on analytics processes, methods and tools used to present, analyse and evaluate learning and teaching in FutureLearn (FL). Papers can be research papers, practitioners’ reports or technical implementations around (but not limited to) these topics:

- The use of data in the running and re-development of FL courses
- The exploration of methods and techniques to leverage on FL data
- Research projects focusing on the pedagogy in FL
- The evaluation of learning and teaching approaches in FL
- The implementation of interesting uses of FL for blended or on-campus courses

Deadline for paper submission: December 19, 2016

For full details please see: https://sites.google.com/site/lak17flworkshop/
Thank you for your attention

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