Learning at Scale: Using an Evidence Hub To Make Sense of What We Know

Conference or Workshop Item

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Abstract
The large datasets produced by learning at scale, and the need for ways of dealing with high learner/educator ratios, mean that MOOCs and related environments are frequently used for the deployment and development of learning analytics. Despite the current proliferation of analytics, there is as yet relatively little hard evidence of their effectiveness. The Evidence Hub developed by the Learning Analytics Community Exchange (LACE) provides a way of collating and filtering the available evidence in order to support the use of analytics and to target future studies to fill the gaps in our knowledge.

Author Keywords
Ethics; evidence; Evidence Hub; learning; learning analytics; teaching

Introduction
The past decade has seen an explosion in the numbers of people learning at scale. Early MOOCs reported course registrations similar to those for the formal courses at some large universities, in the hundreds or low thousands (2). The largest MOOCs are now reporting hundreds of thousands of registrations (4). Except in courses that position 'teacher as learner as teacher' (6), these courses necessarily have an extremely high student/teacher ratio. New tools and strategies are therefore needed to support learners when educators cannot do so on a one-to-one basis.

LACE Evidence Hub propositions

1. Learning analytics improve learning outcomes.

2. Learning analytics improve learning support and teaching, including retention, completion and progression.

3. Learning analytics are taken up and used widely, including deployment at scale.

4. Learning analytics are used in an ethical way.

evidence.laceproject.eu

Learning analytics 'is the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs' (7). The massive online qualities of learning at scale mean that this sector is well suited to the use of analytics. The vision is that analytics will provide 'a new model for college and university leaders to improve teaching, learning, organizational efficiency, and decision-making and, as a consequence, serve as a foundation for systemic change' (5).

However, learning analytics has only been developing as a field for a few years (the first international LAK conference was held in 2011). Although researchers and practitioners can draw on established bodies of work in areas such as educational data mining and business analytics, much work is still in its early stages. Many publications in the area therefore focus on concepts, pilots, promising work and small-scale trials.

This is appropriate and understandable for a new research field, but can prove frustrating for people who are developing learning at scale. With hundreds of thousands of learners in need of support, developers and educators do not necessarily have enough free time to trawl through the literature in search of the hard evidence and analysis that could provide them with the help and guidance that they need.

Filtering the Literature

The need to filter this large body of literature has been addressed by the international Society for Learning Analytics Research (SoLAR) and its members in several ways. The first of these is the development of numerous literature reviews (for example, 1). These are typically aimed at researchers in the field rather than at educators in search of guidance.

The LAK Dataset 'makes publicly available machine-readable versions of research sources from the Learning Analytics and Educational Data Mining communities, where the main goal is to facilitate research, analysis and smart explorative applications' (3). This is a rich and valuable resource for developers in the field but is not easily accessible to readers.

On the SoLAR website, the 'Info Hub' brings together and tags publications, research and events. At the time of writing, it included links to 43 papers, videos, slide-sets and other relevant resources. It provides a useful introduction, but only for those with time to view and read a wide range of resources.

LACE Evidence Hub

The European-funded Learning Analytics Community Exchange (LACE) project is in the process of developing an Evidence Hub that will enable users to search and filter the available evidence. It is designed to be equally useful to researchers and practitioners, and does not presuppose any previous experience of the area.

The Hub centres on four propositions (see sidebar). Each piece of evidence added to the Hub is classified as for or against (or, less frequently, neutral) in relation to one of these propositions. Users can therefore search for evidence that learning analytics improve learning outcomes – or for examples of cases where they have clearly not improved learning outcomes.

The Hub can be searched using different dimensions. Each piece of evidence is also classified in terms of

whether it relates to schools (compulsory education, universities (post-compulsory education), workplace learning or informal learning. It is also related to a geographical location. Where possible, this shows where the research was carried out; if this is not possible, it shows where the lead author is based.

The metadata associated with individual pieces of evidence mean that the Hub can be visualized and interrogated in a variety of ways. Its Search facility supports search by keyword, as well as enabling users to focus on a specific country or sector of interest. Once a search has been run, summaries of the evidence can be viewed. Each summary contains a link to the original evidence, which is not stored in the Hub.

Depending on the needs of the user, these summaries can be accessed in different ways. Country maps show the balance of negative and positive evidence in different countries. The Evidence Map provides a different view of the world that can be searched by proposition, polarity and/or sector, or title keywords. The Evidence Flow diagram shows how much evidence in the Hub relates to each proposition, how much originates in each sector of education, and how much is positive, negative and neutral/mixed.

The main purpose of the Evidence Hub is to help users navigate and make sense of evidence. However, in this fast-developing field, users also need to be able to find out about work under development or currently being piloted. This is particularly the case in the workplace learning sector, where little published evidence is currently available. The LACE consortium has therefore added a Projects section to the Hub as a way of investigating where work is currently being carried out. Project entries include a title, description, country and relevant tags. They can be visualised using a project map.

Once evidence has been located, a plug-in provides mouse-over text that provides an explanation of acronyms. For example, 'MOOC' is explained as 'massive open online course'. The list of acronyms can be expanded as new ones are introduced to the Hub.

Evidence can be exported once it has been located – the CleanPrint plug-in enables download in rich text, PDF or a variety of other formats. These can either be saved to cloud-sharing services such as Dropbox and Google Drive or printed directly.

Additions to the Hub can be publicised using the 'WP to Twitter plug-in'. This automatically tweets 'New evidence: #title# #url#'. This template can be amended to include elements such as author, tag or category – or authors can choose their own structure.

Evidence in the Hub

At the time of writing, there are 70 entries in the Evidence Hub, as well as numerous projects. The Hub contains a balance of entries from Europe and North America and from Schools and Universities. This demonstrates that contributors to the Hub have not restricted their focus to any one geographic area or education sector. With no benchmark for comparison, it is not possible to determine if this is truly representative. However, this does appear to reflect the impression among learning analytics stakeholders that there is much more research in the schools and universities sectors than other sectors.

In general, the Hub contains mostly positive (69%, N=48) or mixed (19%, N=13) reports. The majority of

evidence reported on the site in respect to learning is classed as positive, yet the picture in respect to the impact on teaching is more mixed. Reports about the uptake of learning analytics are mostly positive whilst there are as yet only six entries relating to ethical use of analytics.

Using and Developing the Hub

In recent months, the LACE project has worked with SoLAR to align the Evidence Hub with the submission process for LAK conferences. Everyone who submitted a research paper to LAK16 (co-located with this conference) was asked to fill in fields indicating how their work related to the Hub's four propositions. Now that final versions of LAK16 papers have been submitted, authors will be contacted and all relevant papers will be added to the Hub. This process will be repeated in future years.

The LACE Evidence Hub is therefore a resource that will be of increasing interest to those working in, and researching, learning at scale. This work-in-progress paper not only serves as an introduction to this resource but also provides a call to action, asking all those who attend Learning at Scale 2016 to contribute their own evidence to the project.

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