On March 6, 2018 the workshop “Involving stakeholders in learning analytics: opportunity or threat for learning analytics at scale?” was held at the Learning Analytics & Knowledge Conference in Sydney, Australia. This workshop was organized as part of the STELA project. This document contains a concise report of the workshop outcomes.

WORKSHOP STRUCTURE

The workshop had a duration of three hours. A total of sixteen participants (including three facilitators/authors) attended the workshop. After a brief welcome, each of the participants introduced themselves and their experience with stakeholders in learning analytics. Next the workshop’s goals and context were presented. Then one author of each of the four workshop papers gave a presentation about their respective papers. Each presentation lasted about 10 minutes, with a 15-minute discussion afterwards. At the end of the workshop the outcomes of the different discussions were summarized, and the dissemination of results were discussed. Afterwards, the outcomes of the workshop discussions were used to create a SWOT analysis about the involvement of different stakeholders when introducing learning analytics at scale.

WORKSHOP GOALS

The workshop had two main goals:

1. To discuss at-scale learning analytics interventions; and
2. To explore how the involvement of different stakeholders can strengthen or hinder learning analytics at scale.

PREPARATION

Four papers were submitted for this workshop. Each paper had a presenter during the workshop. Presenters were asked to prepare a 10-minute presentation on the content of the paper, focusing on the topic of stakeholder involvement. The presentation format used was decided by the authors.

Each paper also had a discussant, who was asked to read the corresponding paper for the discussion beforehand in order to prepare at least 3 questions regarding the paper. During the discussion, the discussant first summarized what was learnt from reading the paper, with particular focus on stakeholder involvement.
**PAPERS PRESENTED**

The following four papers were presented by one of their authors during the workshop:

1. **Implementation of an institution-wide learning analytics dashboard: a case study**, Ed Foster & Rebecca Edwards
3. **Lessons Learned when transferring Learning Analytics Interventions across Institutions**, Philipp Leitner, Tom Broos, and Martin Ebner
4. **The LALA Project: Building Capacity to Use Learning Analytics to Improve Higher Education in Latin America**, Jorge Maldonado-Mahauad, Isabel Hilliger, Mar Pérez-Sanagustín, Martijn Millecamp, Katrien Verbert, Xavier Ochoa

**DISCUSSION OUTCOMES**

The discussions after each paper focused on two questions:

1. **How can the involvement of different stakeholders strengthen or hinder learning analytics at scale?**
2. **What kind of opportunities or threats does the involvement of different stakeholders pose to learning analytics at scale?**

The following recurring themes with regards to stakeholders versus deployment at scale were identified during the discussion:

- Participants agree that stakeholders such as students and teaching staff rarely are the bottleneck in LA deployment processes. They might have concerns, but (once those are addressed) generally support the initiatives. So it’s important to keep them aware and on board, but as long as the expected benefits are clear to them, they do not pose an issue. *(PAPER 1 DISCUSSION)*.
- The main challenges for scalability of learning analytics are found in available resources, complexities of university systems, and privacy. Participants agree that it is relatively easy to start a pilot at an institution, but the three factors above can put up serious blockades for deployment at scale. These factors directly translate to stakeholders within the university: leadership (commitment of resources), university systems (adaptability of administration and IT landscapes), and privacy (the university’s legal department and ethics board). *(PAPER 1 DISCUSSION)*.
- Participants agree that national action plans for learning analytics, together with national tools, interfaces, dashboards, etc. are easier to initiate and execute when universities within said country share many common organizational structures and IT systems landscapes. The more diverse the universities and their underlying structures within a given country, the more difficult to initiate a national action plan with a large impact. *(PAPER 2 DISCUSSION)*.
- Participants agree that international cooperation can be very challenging when different partners have to comply with different national privacy laws, as this makes cooperation on data analysis very challenging – more so for data sharing. These also poses a challenge for European projects. *(PAPER 3 DISCUSSION)*.
- Participants agree that you cannot just take a particular learning analytics intervention (such as dashboards) from one country and deploy it in another with the expectation that the intervention will automatically have the same impact as in the country of origin. Cultural differences need to be taken into account. Interventions that work in one country might not necessarily work in a different country. Then there are the systemic differences on a technological level that require adaption of the interventions. As
the educational systems themselves might be vastly different, this puts entirely new requirements on the imported interventions. (PAPER 4 DISCUSSION).

SWOT ANALYSIS

The discussion outcomes served as a basis for a SWOT analysis about the involvement of different stakeholders when introducing learning analytics at scale.

<table>
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<tr>
<th>Helpful</th>
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<tr>
<td><strong>INTERNAL</strong></td>
<td><strong>WEAKNESSES</strong></td>
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<tr>
<td><strong>STRENGTHS</strong></td>
<td>• The more complex a university’s IT infrastructure and landscape, the more difficult it is to scale learning analytics interventions that are integrated with the landscape.</td>
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<td>• Once their concerns (privacy, ethics) are addressed, students and teachers generally support learning analytics initiatives.</td>
<td>• Commitment of the executive board is necessary to gain the necessary resources to scale up learning analytics initiatives.</td>
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<tr>
<td>• Given the academic nature of universities, learning analytics pilots are generally easy to start.</td>
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<td><strong>EXTERNAL</strong></td>
<td><strong>THREATS</strong></td>
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<tr>
<td><strong>OPPORTUNITIES</strong></td>
<td>• Diversity in university governance, structures, and IT landscapes poses a challenge for national approaches to introducing learning analytics at scale.</td>
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<tr>
<td>• National action plans for learning analytics are easier to initiate and execute when universities share common organizational structures and IT landscapes.</td>
<td>• International projects are hampered by different privacy laws in different countries.</td>
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APPENDIX

The following documents are included with this report:

• The introductory paper for the workshop.
• The four papers that were presented and discussed during the workshop.
• Signed list of participants.
Involving Stakeholders in Learning Analytics: Opportunity or Threat for Learning Analytics at Scale?

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ABSTRACT: This article introduces the goal and activities of the LAK 2018 half-day workshop on the involvement of stakeholders for achieving learning analytics at scale. The goal of the half-day workshop is to gather different stakeholders to discuss at-scale learning analytics interventions. In particular the workshop focuses on learning analytics applications and learning dashboards that go beyond the implementation in a single course or context, but that have at least the potential for scaling across different courses, programs, and institutes. The main theme of the workshop is to explore how the involvement of different stakeholders can strengthen or hinder learning analytics at scale. The key findings, recommendations, and conclusions of the workshop will be presented in a summarizing report, which will be shaped as a SWOT analysis for stakeholder involvement for achieving learning analytics at scale.

Keywords: Scalability; Institutional implementation; adoption, learning analytics, stakeholder involvement

1 THEME AND WORKSHOP BACKGROUND

Learning Analytics (LA) is relatively young discipline that has gathered promising results. However, these promising results have not yet resulted in widespread implementation in practice. Often learning analytics tools have difficulty to move out of their prototype setting into the real educational
practice. It has proven to be challenging to create scalable implementations of learning analytics in authentic contexts that go beyond a particular course or setting (Ferguson et al., 2014). Ethics, privacy (Pardo & Siemens, 2014), technical implementation, integration with existing systems, etc. introduce hurdles for implementation in practice and at scale (Khalil, Khalil, & Ebner, 2015). By involving the different institutional stakeholders in the development, testing, deployment, and assessment phase of learning analytics tools, these hurdles might already be mitigated in an early stage of the project. This workshop aims at collecting experiences of implementing learning analytics applications and learning dashboards at scale and the explicit role of different stakeholders in this process (Drachsler & Greller, 2012). The workshop collects “best practices” and “points for improvement” from the diverse LAK community so that the findings can be shared within the community to boost the future implementation of learning analytics at scale.

In the workshop we would like emphasize three viewpoints:

- **Actual experience viewpoint**: experiences with real-life case studies of learning analytics applications or dashboards who actually have been deployed, or have the potential to be deployed at large scale.
- **Technology-wise viewpoint**: technology for learning analytics at scale and integration with existing (proprietary?) school or higher education systems
- **Stakeholder involvement**: how to involve stakeholders for building an institutional or national policy that can pave the road for learning analytics at scale.

For any of the above themes the contributions of researchers as well as practitioners are welcomed. To facilitate comparison and generalization, all submissions will have to be organized according to the recommendation of Bodily and Verbert (Bodily & Verbert, 2017), who recommend nine categories for describing student-facing learning analytics dashboards, and the general framework of learning analytics of Greller and Draschler (Greller & Drachsler, 2012), who use six critical dimensions to describe learning analytics. An example paper will be provided to assist the authors in adhering to these guidelines.

Submissions with actual evaluations results are stimulated, especially if they use state of the art learning analytics evaluation frameworks, such as the one proposed by Scheffel (“Evaluation Framework for LA - LACE - Learning Analytics Community Exchange,” n.d.; Scheffel, 2017).

## 2 WORKSHOP DETAILS

### 2.1 Type of event

The half-day workshop includes different activating formats. The different types of activities in the workshop are focused on achieving one final goal: a SWOT analysis for stakeholder involvement for achieving learning analytics at scale.

The workshop will use an innovative format to ensure that all participants are well-prepared and will be active before and during the workshop. First, rather than presenting their own work, attendees will be asked to present the work, using a presentation or a poster/handout, of another participants based on the publication that was submitted to the workshop. Secondly, another participant (the
‘discussant’) will be asked to prepare three questions about the submission to be send to all other participants. These questions will also be published on the workshop’s webpage.

2.2 Type of participation and target group

The workshop aims at a wide target group: practitioners, policy makers, student representatives, researchers, educational managers from higher education, etc.

The workshop welcomes two kinds of participants: contributors with a presentation or poster and contributors interested in sharing their experiences and joining the discussion.

3 OBJECTIVES & PLANNED OUTCOMES

All the presentations and posters from the workshop will be published on the workshop project page, hosted on the project webpage (Erasmus+ project STELA http://stela-project.eu/LAK2018-workshop). The discussion at the workshop will be documented and published on the webpage. Most importantly the findings, recommendations, and conclusions of the workshop will be presented in a summarizing report. We aim at shaping this as a SWOT analysis for stakeholder involvement for achieving learning analytics at scale. This SWOT analysis will be an integral part of the project’s outcomes and will be promoted as such. It will be available under open access through the project’s and workshop’s webpage. The workshop chairs will ensure that the papers presented in the workshop are published in the Companion Proceedings.

4 INTRODUCTION TO ACCEPTED PAPERS

Four papers are accepted for the workshop. Interestingly all papers are a result of ongoing projects ranging from institution-wide projects to European collaboration projects.

4.1 Implementation of an institution-wide learning analytics dashboard: a case study, Ed Foster & Rebecca Edwards

In this paper the authors elaborate on the implementation of a learning analytics dashboard at the scale of an institute: the Nottingham Trent University, United Kingdom. Based on their experiences, they stress the importance of a wide range of stakeholders. analytics tool would not have been possible without the involvement of a broad range of stakeholders. On the positive side, the stakeholder involvement has provided the necessary skills and expertise, triggered new ideas, but also has been key in gaining buy-in and the embedding of the learning dashboard into actual institutional practices. On the negative side, stakeholder involvement has been proven to be time-consuming, has increased the likelihood for miscommunications, and the risk of alienating stakeholders if they feel their feedback is not incorporated.

4.2 Report on a National Learning Analytics Initiative in Ireland; Lee O’Farrell & Geraldine Gray

In this paper the authors elaborate on an ongoing national learning analytics initiative in Ireland. The project fosters collaboration between different higher education institutions, hereby paving the road for campus-wide learning analytics initiatives. The project is using a two stage approach, of which
stage one is already complete. The result of the first stage is an online learning analytics information resource for the higher education institutions involved. By involving stakeholders in four working groups, the collaboration across institutions was strengthened and the first steps towards a national learning analytics profile were made.

4.3 Lessons Learned when transferring Learning Analytics Interventions across Institutions; Philipp Leitner, Tom Broos, and Martin Ebner

In this paper the authors elaborate on experiences of transferring learning analytics interventions across institutions within the context of a European project. They focus on a particular case study: the transfer of the learning tracker as developed by project partner TU Delft to KU Leuven, based on a technology stack developed by TU Graz. The challenges are grouped in: working with external providers, and working across institutions. They experiences are grouped in a summarizing table that includes questions that will support future learning analytics transfers to better handle the surfacing challenges.

4.4 The LALA Project: Building Capacity to Use Learning Analytics to Improve Higher Education in Latin America; Jorge Maldonado-Mahauad, Isabel Hilliger, Mar Pérez-Sanaguín, Martijn Millecamp, Katrien Verbert, Xavier Ochoa

In this final paper, interestingly the goals, envisioned approach, and first steps of a new European project LALA (“Learning Analytics Latin America,” n.d.) are elaborated on. This project has an even more ambitious goal to transfer learning analytics capacity not just from one European institute to the other, but even from Europe to Latin America. One of the main project goals is to build local capacity and to transfer two specific learning analytics initiatives (LISSA(Charleer, Vande Moere, Klerkx, Verbert, & De Laet, 2017) of the European project ABLE (“ABLE project,” n.d.) and the student-facing learning dashboards of the European project (“STELA project,” 2017) from Europe to Latin America.

ACKNOWLEDGMENTS

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REFERENCES

ABLE project. (n.d.).
Drachsler, H., & Greller, W. (2012). The pulse of learning analytics understandings and expectations from the stakeholders, (May), 120. https://doi.org/10.1145/2330601.2330634
Implementation of an institution-wide learning analytics dashboard: a case study

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ABSTRACT: The following article provides a case study example of a learning analytics dashboard that has been implemented in a large university in the United Kingdom (~28,000 students). Deployment of the dashboard occurred relatively quickly; from the initial business mandate in early 2013, to a pilot in a subsection of the University in the 2013-14 academic year, to entire institution roll out in the 2014-15 academic year. Efforts from this point have been focused on embedding the tool into institutional culture, and further developing the tool in-line with the needs of the users and the changing environment of Higher Education. The University worked in partnership with the technology provider Solutionpath during the initial design of the dashboard, and continues to collaborate closely. As the institution was an early adopter of learning analytics in the UK, many of the lessons learned have come from direct experience. The article is written from the perspective of the internal business owners of the NTU Student Dashboard, and aims to provide an explanation of the rationale for adopting learning analytics at scale, briefly introduce the reader to the resource, and present an overview of stakeholder involvement throughout the process.

Keywords: Learning analytics, dashboard, case study

1 RATIONALE FOR ADOPTING LEARNING ANALYTICS

Nottingham Trent University (NTU) is one of the largest universities in the UK with approximately 28,000 students studying a range of undergraduate and postgraduate courses in a wide range of disciplines1. The majority of students (~75 %) study full time, undergraduate courses. The University has a strong focus on employability and recruits students from a range of socio-economically diverse backgrounds. Undergraduate students enter NTU via two routes; the University & Colleges Admissions Scheme (UCAS), and a process known as ‘Clearing’. Like other providers, NTU sets tariffs for its courses; students are accepted based on either fulfillment of the requirements or via negotiations during Clearing. NTU is ranked 52nd of 129 UK Universities in the Complete University Rankings 20182.


2 https://www.thecompleteuniversityguide.co.uk/league-tables/rankings) accessed 26-01-0218
Recently, it has been awarded two nationally-recognised awards; University of the Year at the 2017 Times Higher Education awards and the Modern University of the Year by the Sunday Times.3

NTU was able to quickly adopt learning analytics as the required data had already been gathered into a data warehouse. Beyond practicalities, the potential of learning analytics to enable a data-driven approach to personalised learning aligned with the University’s commitment to strive towards success for students from a diverse range of backgrounds.

In January 2013, following the completion of a major piece of research into student retention (Foster et al., 2012), a business mandate was written to develop a product to achieve the following:

a. Identify students most at risk of withdrawing early and/or underperforming.
b. Trigger a real-time alert for a personal tutor (or other appropriate staff member) when students exhibit at-risk behaviours.
c. Provide clear routes for personal tutors to refer students for additional support.
d. Provide case work capacity to record interventions and manage ongoing student support.

With such a tool, it was envisaged that staff could contact potentially at-risk students earlier to offer support before problems became more serious. On a broader scale, it would allow the institution to research the most effective strategies for interventions and to make informed changes to the curriculum, learning, and teaching to maximise student retention.

In February 2013, the team added a question to the annual Student Transition Survey, which is circulated to all first-year students in the institution. At that early stage, phrasing the question was difficult as it was not clear that students would understand the phrase ‘learning analytics’ or its implications. Students were asked if the University was able to warn them that they were at risk of early departure would they want to know? 92% of students (n=441) wanted to be told. This was felt to be sufficient endorsement to proceed.

2 INTRODUCTION TO THE NTU STUDENT DASHBOARD

The NTU Student Dashboard has been shaped significantly by user input at every stage of development from pilot to current iteration. It is a staff- and student-facing resource that provides a view of the student’s experience at University based on the digital information available. The dashboard presents two forms of data to the user. Firstly, an engagement rating generated by the dashboard’s underlying algorithm, analysing students’ engagement with learning and teaching activity (for example borrowing a library book). The original version used four data sources and presented four engagement ratings to the user (‘high’ to ‘low’). Following user consultation and the availability of further data, the current version now uses six data sources and presents five ratings (‘high’ to ‘very

The data is presented in a way that allows users to see both a summary of engagement behaviour over extended timeframes and short-term changes in behavior (figure 1). Secondly, the dashboard provides valuable contextual information including a profile page detailing basic information about a student including a photograph, their entry qualifications, and their course description and personal tutor’s name. Other pages provide assessment and feedback documentation for coursework submitted through the VLE, and the ability to make/view notes about staff-student meetings and subsequent actions or referrals to support.

The dashboard works on a two agent of change model; students can use the data for benchmarking, self-reflection and goal setting, and staff can use the data to assist students in these processes and to identify students who require additional support. This is perceived as particularly useful for first year students who are new to Higher Education. It should be noted that whilst any approach using purely digital data is likely to have limitations, the tool can still be used effectively within these. At NTU, one of the key functions of the dashboard is to strengthen the staff-student relationship by facilitating informed discussions. As a student facing tool, the language contained within the dashboard is very important. In the pre-project phase it was decided that the dashboard should focus on student engagement, not risk of failure. It was felt that if a student could see on their dashboard that they were highly at risk of withdrawal, this could be potentially highly demotivating and counterproductive. Therefore, ‘high’ means ‘highly engaged’ not ‘highly at risk’.

Figure 1: Screenshot of the NTU Student Dashboard student landing screen, showing different visualisations of the engagement data.
3 STAKEHOLDER INVOLVEMENT

As an institution-wide resource, the dashboard has a wide range of internal stakeholders. Arguably, most key are the users themselves: students and staff. Staff members include course staff, particularly personal tutors, and professional services staff members providing pastoral and academic support. However, the interests of the users need evaluating and prioritising. This work is carried out by the NTU business owners; the Student Engagement Team, and the University’s Information Systems (IS), who are jointly responsible for the design, implementation and maintenance of the tool. Strategic vision, provision of resource, and high-level backing is provided by University senior managers, and is vital to the continued success of the project.

Further stakeholders include the data owners of the information used by the tool, the policy makers who are responsible for outlining expectations of use of the tool, and the legal services team who are responsible for ensuring the tool and its use comply with legislation. The providers of the dashboard, Solutionpath, are the major external stakeholders in the process, as developing and maintaining a high-quality product is important to their business strategy.

The structures and mechanisms in place to facilitate stakeholder involvement have proved invaluable throughout the process of dashboard development and integration into institutional practice. A combination of different types of working groups provided the necessary access to a broad range of staff members, including specialist support from relevant areas of the University and Student Union representatives, at the point where they could most usefully contribute to the resource’s development (Figure 2). Further views, invaluable to the development process, were elicited from staff and student users by the central market research team. Further to these formal structures, stakeholder involvement has been promoted by the running of small to medium scale pilot activities with the academic Schools and gathering feedback from user queries to the IS service desk.

The core principles that underpin the dashboard were defined by the pre-project team in consultation with staff, students and relevant specialists from within the institution, and have remained the same since. These well-considered and ethically-informed decisions were perceived as strong foundations upon which the tool should be built. The core functionality, in terms of building the algorithm itself and the timescale for appropriate alerting, was a data-driven process led by Solutionpath and, with the exception of a recent change of the algorithm to incorporate additional data sources, has also
remained consistent. This reflects the need to focus on expert input for certain aspects of a project, and to have a framework to underpin supporting features and future developments.

Perceptions of the dashboard are important to stakeholder engagement and buy-in. Designing the product with both the core purpose and the ethical issues at the forefront, and with a high degree of user input, can help mitigate against concerns. User views have shaped the resource at every stage of dashboard development. Many integral elements of the tool, including the information it displays, the way it presents data, the language used within it, and its additional functionalities, have been guided by user input. Developing the tool in this way has undoubtedly led to a more useful resource, however, it has not been problem-free. It is far easier to gather user views than it is to actually integrate them into an existing schema, let alone provide development capacity to fulfil them. Gathering user views without the capacity to quickly embed them was at times frustrating and demotivating to the development team. Secondly, users have blind spots. Staff in particular, were fixated on the importance of attendance data. Despite repeated evidence of the association between engagement and student success (without attendance data), there remained in some quarters the view that attendance was the more important measure and that the algorithm could not function correctly without it. This may reflect communication failings by the development team, but also demonstrates how difficult it could be to encourage people to think differently.

Early feedback from students highlighted the need to scaffold the introduction of the learning analytics tool in different ways. Overall, students liked the resource, but it was clear that they had not particularly engaged with it during the pilot. In part this was because the link to access the tool, although not hidden, was not obvious enough. Students wanted more communication about how to use the resource and the benefits of doing so. They wanted to see the same information as staff, for example “I want to be able to see that is collected on me so I know what they can see about me”. They particularly wanted to see their own attendance data and finally, they wanted to be able to see the dashboard on mobile devices.

Responding to the needs of the users and committing to developing and promoting the tool and associated resources throughout the implementation of the dashboard, has resulted in the number of log-ins increasing year-on-year. From first year of institutional roll out (2014-15) to the last full academic year at the time of writing (2016-17) both the number of unique staff and students users and the average number of log-ins per year has increased. In 2016-17, over 2,500 staff members logged in an average of 16 times per year and over 28,000 students logged in an average of 19 times, taking the total number of log-ins for year to around 600,000. Importantly, in this year, over 90% of first year, full time undergraduate students across the institution logged in to the dashboard, with over 40% of these logging in 10 times or more throughout the year.

Involving stakeholders effectively requires a shared language and a shared understanding of both the high-level vision and purpose, and the finer details of the project. Being the business owners at the interface between stakeholders such as IS and Solutionpath; who require high levels of detail to function correctly and stakeholders such as the users and wider University community; who are generally consulted on a much broader basis, has presented its challenges. In particular, being unaware of underlying assumptions and tacit knowledge has led to instances of miscommunication and inefficiencies in the process. One example, from near that start of the development process, was defining which staff members should have access to which students on an institutional level. Whilst
University organisational structures and job roles, such as ‘personal tutor’, may appear clean and easily defined to an outside party, the reality is that they can be both complex and variable across the institution. Courses with non-standard start dates, joint honours degrees and staff with multiple roles are all factors that can make systematically defining which staff should have access to which students at any point in time more challenging than it may first appear, particularly if the system is not built with these complexities in mind.

4 CONCLUSION

Successful implementation and integrating of an institution wide learning analytics tool would not have been possible without the involvement of a broad range of stakeholders. Involving stakeholders in the process has provided necessary skills and expertise, allowed for new ideas and sense checking, and has been an important part of gaining buy-in and embedding the resource into institutional culture/working practices. However, it has also been time consuming, has increased the likelihood of miscommunications, and has come with the fear of alienating people when not all advice and feedback could be reflected in the final product.

Experience and common sense both dictate that developing an institutional resource without user views, in particular, would be foolish. However, the importance of experts considering, filtering and developing those users’ ideas should not be underestimated. As with any resource, the wider context in which it is being used should be kept in mind, and a balanced and pragmatic approach to should be taken to its development.

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REFERENCES

Report on a National Learning Analytics Initiative in Ireland

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ABSTRACT: Development of learning analytics capacity and practice at institution level is a challenging task. This paper reports on an ongoing, national project in Ireland that is addressing this challenge by fostering learning analytics collaborations between higher level institutions. Such collaborations are enabling the development of learning analytics capacity across the higher education sector with a common goal of supporting a holistic view of student success. Academic and non-academic staff from over twenty Higher Education Institutions are involved in the project.

Keywords: institutional approach to learning analytics, student success initiatives, higher education in Ireland.

1 INTRODUCTION

Cross-institution coordination of learning analytics is rare (Shacklock, 2016), and can be a daunting task from a number of perspectives including financial costs, ethical and privacy considerations, and uncertainty on beneficial uses of student data and models (Fergusson et. al, 2016; Slade & Prinsloo 2013). A recent review of Learning Analytics in the thirty-six Higher Education Institutions (HEIs) in Ireland reflects experiences elsewhere (O’Farrell, 2017). To some extent, all HEIs were using learner data to understand and respond to students’ learning needs. Simpler examples included identification of at-risk students from assessment data at subject level; use of grade curves at program level to identify modules that deviated from the normal distribution; and reviews of student services based on qualitative data generated through feedback surveys. However, just three Irish HEIs were using learning analytics as part of an institutional strategy focused on student success and retention; three had mature learning analytics capabilities that were not driven strategically at institution level; five were planning technologies or data management approaches to enhance learning analytics capability; and just one staff member held a role that formally included intervening with students whose digital footprint suggested a lack of engagement. The thirty-six HEIs included seven publically funded universities, fourteen publically funded Institutes of Technology, six partly funded colleges and nine private, non-for-profit colleges.1 Interestingly, strategic institutional learning analytics approaches

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1 Applications to all full-time higher education courses in Ireland is managed by a Central Applications Office. Places are offered based on grades achieved in state examinations at the end of secondary school. Fees are comparable across the sector, and capped at €3,000 per annum for EU citizens.
were more common in private HEIs than publicly funded institutions, which reflects evidence from other jurisdictions (Sclater & Mullan, 2017).

Commonly cited barriers to greater adoption of learning analytics in Irish institutions included: limited resources with other business critical priorities taking precedence; a perception of lack of expertise in developing learning analytics capacity; a perception that learning analytics requires a significant capital investment; and a lack of awareness of learning analytics capacity within VLE platforms already in use. However, learning analytics was ranked within the top five institutional priorities for Irish HEIs over the next three years (National Forum, 2017).

This paper reports on a national project established to collaboratively develop learning analytics capacity in the HEI sector in Ireland. The project is led by the National Forum for the Enhancement of Teaching and Learning in Higher Education, a government funded agency tasked with enhancing teaching and learning for all students in higher education. The paper also includes a perspective from one HEI involved in the project, Institute of Technology Blanchardstown.

2 NATIONAL LEARNING ANALYTICS INITIATIVE

Overarching the developing of a national led learning analytics initiative is adherence to principles of moral and ethical standards of practice as proposed by Slade & Prinsloo (2013). These include: recognition that students are active partners in the learning process; full disclosure of all uses of data (a legal requirement in the EU); realization that analysis of learning data cannot accurately reflect the complexities of learning behavior and so is limited in scope; and recognition that analysis of data provides a snapshot of some aspect(s) of student behavior that is itself fluid, so is limited temporally. Therefore, it is important to differentiate between a reporting of facts, and understanding that learning is more complex than the facts and models can capture. Without a more nuanced, considered understanding, the risk of commodifying students becomes a genuine threat to how students are perceived and treated by the institution. To paraphrase Kahneman (2011), “what you see is not all there is”.

In spite of these limitations, learning analytics has gathered considerable momentum, and its potential for enhancing teaching and learning has been correctly lauded. Learning analytics models can provide useful insights into the learning environment, and can support teaching and learning if used in combination with effective intervention strategies (Dawson, Jovanovic, Gašević, & Pardo, 2017; Jayaprakash, Moody, Lauría, Regan, & Baron, 2014). Analytics is a tool to help answer questions and provide insights. Effective use of this tool in broader, proactive student success initiatives can enhance the learning experience.

As the principles outlined above emphasize, institutions will have a better chance of achieving broad student success if their learning analytics strategies consider the whole student, the dynamic nature of learning, and the conditions within which learning occurs. Individual differences dictate that one-size-fits-all interventions risk being insensitive to the entire range of extra-academic issues that individual students face. Such intervention models may also promote a false understanding that all

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2 https://www.teachingandlearning.ie/
students, regardless of personal circumstances, must adhere to a given model of learning and success (O’Farrell, 2017).

Within this context, in 2016 the National Forum for the Enhancement of Teaching and Learning in Higher Education launched its Learning Analytics and Educational Data Mining for Learning Impact project, led by Lee O’Farrell. The project aims are:

- To raise awareness of emerging national and international policy and practice relating to Learning Analytics / Education Data Mining (LA/EDM) in all sectors of higher education in Ireland, among the student body, library/learning support staff, ICT/services staff and academic staff at all levels engaged in developing and teaching programmes and in senior/academic leadership roles.

- To establish a sustainable network of LA/EDM practitioners/collaborators in Irish HE with a view to proactive information sharing and development and dissemination of relevant case studies.

- To provide informative briefings that can support the translation of LA/EDM research findings (national & international) into meaningful practice at scale within programmes/departments in different academic disciplines.

- To develop a set of online resources (including links to already existing resources) relating to LA/EDM policy, practice and implementation at scale.

- To foster intra- and inter-institutional collaboration in the development and implementation of LA/EDM initiatives, with particular reference in the first instance to implementations that target first year student retention.

The project has two phases: phase one developed an Online Resource for Learning Analytics (ORLA); phase two is working with HEIs on a Data-Enabled Student Success Initiative (DESSI). Both will be discussed in the following sections, along with the experiences of one partner HEI.

2.1 ORLA: Online Resource for Learning Analytics

The Online Resource for Learning Analytics (ORLA) incorporates a range of learning analytics resources relevant to higher education, and is summarized in Figure 1. Launched in October 2017, ORLA includes guidelines on how to develop an institutional learning analytics strategy, how-to guides for educators, and learning analytics case studies from Ireland and abroad. The resulting resources arose from the work of four national advisory groups convened to contribute to ORLA, comprising of sixty representatives from eighteen HEIs across Ireland. The groups were: IT & Infrastructure to document the data captured by platforms and products in use across the HEI sector in Ireland including student information systems, library systems, VLEs, and other data sources; Data

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4ORLA website: www.teachingandlearning.ie/NFOrla
Aggregation & Modelling to develop guides on modelling this data; Policy, Ethics & Law to develop guidelines on ethical and legal considerations; and Teaching, Learning and Effective Interventions to develop guidelines on good practice when planning analytics led interventions.

Figure 1. Online Resource for Learning Analytics

2.2 DESSI: Data-Enabled Student Success Initiative

The Data-Enabled Student Success Initiative (DESSI)\(^5\) will progress the work of ORLA by working with individual institutions to develop their learning analytics capacity. In line with the national imperative to pool resources and share services (Department of Education and Skills, 2017), the project will identify common requirements across institutions that can be developed at a national level, including policy recommendations and/or tools. It is led by the National Forum for the Enhancement of Teaching and Learning in Higher Education, in partnership with the Department of Education and Skills and state agencies supporting and overseeing Higher Education in Ireland. These agencies include the two overarching bodies of the Higher Education Authority (HEA) and Quality and Qualifications Ireland (QQI); the three bodies overseeing sections within HE, namely, the Irish Universities Association (IUA), the Technological Higher Education Association (THEA), and the Higher Education Colleges Association (HECA); the two bodies providing IT services to the education sector, namely, HEAnet (providing internet connectivity and ICT services) and EduCampus (provider of IT shared services); and the Irish Survey of Student Engagement (ISSE) group who run national surveys for student feedback. The project is funded until the end of 2018, and is guided by four core principles: developments in learning analytics should support a holistic view of student success; taking a strategic institutional approach to learning analytics is both valuable and necessary; resources, tools and services should only be employed by HEIs to support learning analytics following a review of their suitability, scalability and

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\(^5\) www.teachingandlearning.ie/DESSI
adaptable to the specific context; and every effort should be made to share learning analytics services across the sector to avoid inefficiencies or duplication of effort.

It is intended that the spirit of collaboration fostered in the development of ORLA will be harnessed within DESSI to allow institutions to efficiently foster innovative, evidence-based teaching and learning environments with student success at their core.

2.3 The perspective from one HEI: Institute of Technology Blanchardstown

Those involved directly in ORLA and DESSI comprise of a small number of staff from any one HEI. However, successful implementation of a campus wide learning analytics initiative requires engagement by all relevant stakeholders within an institution. This section case studies activities arising from ORLA and DESSI at one HEI, namely Institute of Technology Blanchardstown (ITB). It is the newest Institute of Technology in Ireland, established in 1999. It offers undergraduate and post graduate courses in Computing, Engineering, Horticulture, Social Care, Business and Sports Management. The college has an enrollment of approximately 3,500 students.

Following the launch of ORLA, ITB ran two workshops to start the conversation on ITB’s learning analytics agenda, and collect perspectives from relevant stakeholders across the institution. All staff were invited. A total of twenty-eight attended workshops, including academic staff and representatives from student support, library, exams office, finance office, IT services, quality assurance, careers service, student representatives and senior management. The following paragraphs summarize workshop outcomes, capturing campus wide perspectives and aspirations for learning analytics.

Understanding our students: Learning analytics should enhance our ability to understand students, inform support initiatives, and promote an ethos of humanity and empathy. Data analysis should incorporate the full student story including non-academic contexts such as where they come from, how they get here, are they spending time on campus and are they joining clubs and societies.

Understanding our data: We need a better understanding of the data we have and better understanding of what can be inferred from existing data sources. There is also scope for greater awareness of ways to improve data quality, such as the use of more descriptive names on learning resources to improve the usefulness of data recorded in VLE activity logs.

Enhance student support: Learning analytics should enable early identification and follow up support of at-risk students, and provide more opportunities for student feedback including sentiment.

Limitations: Time and financial constraints dictate small steps with simple analytics as the most realistic next steps.

ITB’s involvement in ORLA and DESSI has raised the profile of learning analytics across the institute, and has fostered invaluable momentum, support and enthusiasm for the development of campus-wide learning analytics capacity. Workshop participants are currently establishing a learning analytics committee with representation from student support/library/careers, exams/finance, IT services, quality assurance, student representative and academic staff. It will report to the quality assurance subcommittee of academic council. The learning analytics committee will consider both workshop
outcomes, and ITB student expectations and perceptions currently being assessed using the Student Expectations of Learning Analytics Questionnaire (SELAQ) developed by Whitelock-Wainwright, Gašević and Tejeiro (2017). Working with other partners in DESSI, a priority of this group is to develop a learning analytics policy and strategy, student information sheet, and a data protection impact assessment for learning analytics at ITB. The group will also identify a first campus-wide learning analytics project that supports existing First Year Experience initiatives.

3 CONCLUDING REMARKS

Fostering collaborations across the higher education sector can support the development of campus-wide learning analytics initiatives. In Ireland, a national led Learning Analytics and Educational Data Mining for Learning Impact project is doing this in two stages. The first stage convened four working groups to develop an online, learning analytics information resource for the HE sector. This both fostered collaborations across institutions, and raised the national profile of at-scale learning analytics. Stage two is now underway, working with learning analytics committees at partner institutions to identify common requirements, including both policy recommendations and tools. A case study of one institution highlighted the benefits of both a national agenda, and a collaborative approach, in building momentum and support for the development of institution wide learning analytics capacity.

Cross-institution coordination of learning analytics is a non-trivial task, that requires the co-operation and input from students, academic staff, support staff, and management. Resource limitations support less costly, phased based implementation approaches, informed by guidelines on some simple but effective uses of data and a better understanding of resources already in place. There is a lot of expertise dispersed both within and across institutions. Collaborative initiatives can consolidate existing expertise while maintaining an overarching, common goal to keep a focus on the human stories behind the data, and ensuring that facts and figures alone do not become the full story.

REFERENCES


Lessons Learned when transferring Learning Analytics Interventions across Institutions

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ABSTRACT: Learning Analytics is a promising research field, which is advancing quickly. Therefore, it finally impacts research, practice, policy, and decision making [7] in the field of education. Nonetheless, there are still influencing obstacles when establishing Learning Analytics initiatives on higher education level. Besides the much discussed ethical and moral concerns, there is also the matter of data privacy.

In 2015, the European collaboration project STELA started with the main goal to enhance the Successful Transition from secondary to higher Education by means of Learning Analytics [1]. Together, the partner universities develop, test, and assess Learning Analytics approaches that focus on providing feedback to students. Some promising approaches are then shared between the partner universities. Therefore, the transferability of the Learning Analytics initiatives is of great significance.

During the duration of our project, we found a variety of difficulties, we had to overcome to transfer one of those Learning Analytics initiatives, the Learning Tracker from one partner to the other. Despite, some of the difficulties can be categorized as small, all of them needed our attention and were time consuming. In this paper, we present the lessons learned while solving these obstacles.

Keywords: Learning Analytics, scalability, cooperation, lessons learned

1 INTRODUCTION

Learning Analytics has emerged in the last decade as a fast-growing and promising research field in Technology-Enhanced Learning (TEL) by providing tools and platforms that influence researchers [10, 6]. Long defined Learning Analytics as “the measurement, collection, analysis, and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the
environment in which it occurs” [14]. Since it was first mentioned in the Horizon Report 2012 [9], various different projects and initiatives were performed surrounding Learning Analytics, which is finally entering the next phase and has an impact on research, practice, policy, and decision making [7].

Nonetheless, there are many obstacles when establishing Learning Analytics initiatives especially in higher education. Besides ethical and moral issues, the matter of data ownership and data privacy is getting more and more important [5]. Particularly affected are the member states of the EU as the new EU General Data Protection Regulation (GDPR) is going to be enforced soon. Thereby, the users, lecturers and students, have to be informed in advance of what is going to happen with their personal data as well as give the consent. Unfortunately, anonymizing personal data to circumvent the issue with personal data makes Learning Analytics more difficult and is not that trivial [11]. Further, many Learning Analytics projects are still in the prototype phase, because of issues with transferability and scalability [13].

Within the scope of the European collaboration project STELA, the Learning Tracker [8] was proposed for giving students feedback in a Small Private Online Courses (SPOC) deployed at KU Leuven. In this publication, we will present issues and lessons learned in the process of deployment. We summarized this through two research questions:

**RQ1:** What should be kept in mind when working with external providers?

**RQ2:** What should be kept in mind when working across higher education institutions?

In the next section, we start by explaining the case study and its circumstances. Section 3 explores issues when working with external providers and the lessons learned. In Section 4, we discuss obstacles when working across institutions and how to overcome them. Conclusion and remarks on future work are presented in Section 5.

## 2 CASE STUDY

The Erasmus+ STELA project [1] is a European collaboration project with the primary partners Catholic University of Leuven (KU Leuven, Belgium), Delft University of Technology (TU Delft, Netherlands), Graz University of Technology (TU Graz, Austria), and as secondary partner the Nottingham Trent University (NTU, England). The main goal is to enhance the successful transition from secondary to higher education by means of learning analytics. Together, the partner universities develop, test, and assess Learning Analytics approaches that focuses on providing formative and summative feedback to students in the transition. In the first step, promising approaches are shared between the partners to evaluate them under different circumstances. Therefore, transferability, scalability, and modularity of the approaches are of high interest.

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1 https://www.eugdpr.org/ - Last accessed January 30th, 2018
One promising initiative of University of Technology of Delft is the so-called “Learning Tracker” [8], which is made available by TU Delft as open source and is displayed in Figure 1 by a typical user interface. The Learning Tracker itself tracks the behavior of all current participants in the MOOC and displays it against the aggregated activities of previous participants that successfully completed. Thereby, the Learning Tracker supports learners in Massive Open Online Courses (MOOC) in becoming more efficient and encourages them to develop their self-regulated learning skills by reflecting on their own learning activities [8]. This approach follows Baker’s alternate paradigm for online learning by using the information to rather empower human decision making than feeding it to an intelligent learning system [2].

Figure 1: Visual design of the Learning Tracker. It provides several metrics in a small space and offers a simple overall evaluation [8]

The Learning Tracker was already deployed within different MOOCs and has been shown to be easily transferable to different MOOCs on the same platform within the same university [4]. The impact on the engagement of the students in comparison to the completion rate of the MOOC was evaluated and the results have shown that the Learning Tracker improves the achievement of already highly educated learners, but is less effective for less educated ones [4]. Further, it has been shown that the cultural context of the learners is impacting the engagement and the completion rate [4].

Our goal was to deploy the Learning Tracker to the Chemistry SPOC of KU Leuven, which is based on the edX system. Further, we wanted to get the Learning Tracker more dynamically. Therefore, we used the opensource technology stack developed at TU Graz within the STELA project [12]. Figure 2 illustrates a flow diagram of responsibilities and relations throughout the case study.

2 https://github.com/ioanajivet/LearningTracker – Last accessed January 30th, 2018
This section deals with obstacles when working with external service providers (RQ1). We start by explaining issues with data ownership when using an external service provider. Then, we discuss what should be kept in mind when exchanging data with external service providers.

### 3.1 Data ownership issues

Essential when working with external service providers, is the question “who owns the data?”. Here we don’t consider matters related to copyright of the material provided on the platform. We also make abstraction of the more fundamental idea that the final ownership of student produced data, whether it concerns learner created content or simply digital activity traces, should always belong to the students themselves.

When the external party functions as a contractor for the institution, it is reasonable to assume that the latter preserves full ownership. But what if the platform of the service provider is independent and subsequently used by the institution to deliver its content to learners? To draw a parallel: when a company uses a popular social media platform like LinkedIn to disseminate its message, would one not assume that the platform provider retains the ownership of data related to its own user base, even if it was in fact the company that pushed these users to the platform in the first place? And yet, it may come as a surprise to institutions that they don’t automatically acquire ownership of or even access to student data within the external educational platforms used by them.

KU Leuven invested extensively in its Learning Management System “Toledo”, which is predominantly based on the Blackboard product line. The system is maintained by an internal team and embedded in a broader software architecture, fully hosted in the university’s own data center. Only in recent years, KU Leuven started to invest in MOOCs and SPOCs. Due to the limited in-house experience with MOOC’s and the common practice of hosting shared by many institutions of using an existing platforms, edX was selected as KU Leuven’s MOOC platform of choice. However, while the issue of ownership of “Toledo” data did not arise before, it suddenly become relevant in the new context of the edX platform.
3.2 Exchanging data with external providers

Once an agreement with the external service provider is established, the problem of data access arises. For information systems managed by the institution itself, there is usually an option to extend or modify the software to export data required for the Learning Analytics application. In many cases, the data may also be fetched from a database management system directly, by setting up an ETL-process (extract, transform, load) as is common in the domain of Business Intelligence (BI). Institutional IT services are often familiar with these practices, also used to enable reporting on data captured in financial, administrative, Human Resources (HR), and other information systems.

Yet when working with an external service provider, data is not directly accessible by the internal services. As the software is primarily designed to serve multiple tenants, it may not be straightforward to adapt it to meet the data needs of a single institution – especially in the context of an ongoing research project, when requirements are still unstable.

In some cases, the service provider offers a set of application programming interfaces (APIs) to facilitate the communication with on-premises software of the institutions. However, these APIs are likely to be limited to the use-cases anticipated on beforehand, if not by internal planning and priorities. Innovative and experimental use of data, as it is to be expected within a research context, is not always compatible with this approach. The resulting requirement is to dig deeper into the data that is being captured by the external system, if possible by accessing it directly, circumventing the limited scope of the APIs. After all, this would also be a common approach for internal systems, as explained above.

Apart from the requirement to create clarity about the data ownership and sharing, our case study also involves finding a technical process to get the data from the service provider. edX indeed offers an API for accessing student activity data. However, the provided methods are limited to the data perspectives as imagined by the edX developers and incompatible with the requirements of the TU Delft Learning Tracker. On request, edX offered the option to get direct access to extract the underlying log data through an FTP server. The manual way of working is little optimized for continuous, preferably real-time data extraction, but it allows the initiation of the case study implementation. At KU Leuven side, the process of collecting data from edX needs to be further automated. A question is how to anticipate data structure changes on edX side, as the data format is meant for internal use and might be reorganized in the future.

A related issue concerns the reverse flow: once the exported data has been transformed into information that may be offered to students, how can this information be fed back to them? edX supports the Learning Tools Interoperability (LTI) standard created by the IMS Global Learning Consortium. This standard was designed to enable the sharing of tools across different learning systems. In our setup, the edX environment is the LTI Tool Consumer and our Learning Tracker system is the LTI Tool Provider. When the Learning Tracker is shown to the student, edX (trusted consumer) passes a user identification string, whom makes an extra authentication step on the provider side unnecessary.
4 WORKING ACROSS INSTITUTIONS

In this section, we discuss obstacles when working across higher education institutions and how to overcome them (RQ2). First, we explain what you need to keep in mind when facilitating cross-border European initiatives. Second, we point out how to handle external data subjects.

4.1 Facilitating cross-border European Initiatives

Research cooperation is common among European universities. Students, lecturers and researchers are increasingly roaming from one institution to another, increasing the opportunities for teaming up. But when the research project directly involves the daily practice of the involved institutions, practical incompatibilities may start to surface.

If working together with institutions within a single region may already be complicated, working across (European) borders is unlikely to make matters easier. Despite the unification efforts of the Bologna Process, Higher Education Institutions (HEI) from different European countries operate in dissimilar contexts. Education and general laws, culture, and societal views on the role of education, organization of the institutions, and role of the government are just a few examples of contextual areas that are likely to differ from one country to another. Not in the least because education today is often influenced by local tradition.

While preparing the case study implementation, it became clear that the Austrian view on data privacy is more strict than the Belgian interpretation. Privacy awareness is stronger developed in the Austrian and German culture. Notwithstanding the General Data Protection Regulation (GDPR), which will soon be in effect throughout the entire European Union, the interpretation of what is allowed and what is not turned out to be rather different. The Austrian reading, as translated into TU Graz internal policy, for instance, directs on avoiding the integration of data from separate source systems.

The concept of processing data about the Belgian students on its Austrian servers provoked resistance on the side of TU Graz, as it would put the internal IT department in a challenging position with respect to its policy. Consequently, the alternative of moving the case study implementation to the KU Leuven infrastructure was considered. However, this would require a TU Graz project member to access the server infrastructure of KU Leuven remotely. While there was no objection to this in principle, this turned out to be practically impossible to arrange without an existing employee relationship: the procedure to do so was nonexistent.

4.2 Handling external Data Subjects

The debate about ethics and privacy in Learning Analytics is growing. Skeptics are questioning to what extent providers of education are entitled to study the learning behavior of their students. LA proponents, on the other hand, are arguing that it is the duty of educators to improve learning and that it not using data to do so may be unethical. In most cases, the (implicit) focus of such debate however, is on data institutions collect and process about their own students, it is to say, student with which the institution has some kind of formal engagement. It is not uncommon for students to sign a contract at registration that already contains certain agreements about if and how the institution may use learning traces for educational research or to improve its internal educational processes.
However, as is the situation for our case study it is also not uncommon for higher education institutions to interact with prospective students prior to official registration. This complicates matters of privacy and ethics, and in the absence of an agreement, it is less clear what data institutions can use to extend their mission to improve the quality of education to the orienting and transitional process. We therefore prefer to extract as little data as possible (data minimization) to enable the selected features of the Learning Tracker tool. This, for instance, does not require knowledge of the student’s name or any other characteristics, besides some kind of user id or pseudonym which is also required to feed the resulting charts back into the SPOC user interface.

The external data subject issue is discussed in detail by [3], applied there to a shared positioning test for engineers students, co-organized by several universities. The proposed solution uses an anonymous feedback code that is provided to students. In this approach, data subjects retain a large part of the data ownership and freely decide to transfer data across service providers or institutions.

5 CONCLUSION

The intention of this paper was to formulate lessons learned, which the authors consider important for future development and implementation of Learning Analytics initiatives. In this paper we have outlined obstacles when working with external providers (RQ1) or across institutions (RQ2), and proposed partial solutions to overcome them. We try to allow that implementer of Learning Analytics initiatives can benefit from this findings, adjust properly and thereby, save time and effort. In Table 1, a summary of questions that surfaced during our case study is provided.

<table>
<thead>
<tr>
<th>Source of issue</th>
<th>Issue</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working with an external provider</td>
<td>Data ownership</td>
<td>• Who owns the data? The institution or the service provider?</td>
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<tr>
<td></td>
<td>Data access</td>
<td>• How to get data out of the external platform? Are API’s available and sufficient? Is direct data access possible?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• How to get information back into the systems? How to reach the end-user? Is a standard (e.g. LTI) supported?</td>
</tr>
<tr>
<td>Working across institutions</td>
<td>Working cross-border</td>
<td>• How does the educational context differ from one partner to the other? In case of shared legislation, does the interpretation differ?</td>
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<tr>
<td></td>
<td></td>
<td>• What procedures are available to host other partner’s data or to provide access to a researcher staffed by another partner.</td>
</tr>
<tr>
<td>External data subjects</td>
<td></td>
<td>• To what extend can data from unregistered/prospective students be used to improve education and to feed information back to these students?</td>
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<tr>
<td></td>
<td></td>
<td>• If anonymous data is insufficient, is the use of pseudonymization tokens (e.g. feedback codes [3]) an alternative?</td>
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</tbody>
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REFERENCES

The LALA Project: Building Capacity to Use Learning Analytics to Improve Higher Education in Latin America

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ABSTRACT: Learning Analytics has been widely developed in European countries. Latin America is also starting to measure and optimize teaching and learning processes through Learning Analytics. However, the existing attempts in this direction are very isolated. Further efforts are needed in order to promote greater sharing of best practices between regions. Along these lines, the present work presents the LALA project with the aim of building capacity to use Learning Analytics to improve higher education in Latin America. At the end of the project we expect to have built local capacity for decision-making by using educational data, a community of practice around learning analytics, and a methodological framework to guide Latin American institutions to adopt tools to support learning.

Keywords: LALA Project, Learning Analytics, Latin America

1 INTRODUCTION

Students in higher education are producing data at increasing pace. Demographic information captured at registration, test results, interaction with the learning management system (LMS) or which books the student loans from the library are just a few examples of the many data traces left behind by students. Most of this data is being stored for administrative purposes only, often to be never used again. However, these data have the potential to improve the decision-making process of several stakeholders of the higher education institute (HEI).

In Europe, multiple researchers from Higher Education Institutes (HEIs) are looking to support the decision-making process with their available data. This support goes further than reporting data with existing tools as data cubes and ad-hoc queries. This support consists in learning analytics tools that not only report on what happened before, but also estimate what could have happened if the current trend continues to optimize an existing process.

The field of Learning Analytics and Academic Analytics has developed considerably during the last year in European HEIs. Through the use of Learning Analytics tools, the management of Universities and
Academic programs in Europe has been modernized. However, in the specific case of Latin American (LatAm), there is a lack of local capacity to design and build these specialized tools that could be used to improve HEIs administration. The scarce of financial resources or the inequalities to distribute them across institutions and educational levels prevent the implementation of tools to analyze educational data, so most decisions in the LatAm academic settings are based on budgeting, preconceptions or even feelings. If data is used, it is in the form of database reports that only provide the most basic level of information. Due to the last decade modernization of academic systems in most LatAm HEIs, there is an opportunity to use that large amount of data to drive management towards learning improvement.

Given that situation, in this work we present the LALA project, which seeks to modernize the academic decision making process through building local capacity to create Learning Analytics to support decision makers at different levels in LatAm HEIs. To achieve this purpose, this project is inspired by several projects currently running in Europe to facilitate the adoption of Learning Analytics tools. These European projects will bring the expertise developed in: 1) ABLE project in which research the use of learning analytics to identify students at risks. The aim of this project relied on the use of learning analytics dashboard that has been designed, developed and evaluated to facilitate communication between study advisors and first year students, 2) STELA project in which research the use of learning analytics dashboards to support interventions to students. The main focus of this project is on providing formative and summative feedback to students, and 3) SHEILA project which aim is to develop a policy development framework that will assist higher education institution in adoption of learning analytics. The policy framework is based on the ROMA model that was originally designed to offer translation of scientific evidence to a policy and recently suggested for learning analytics.

The LALA project fit the priorities set for LatAm inside the Erasmus Plus project call for Capacity Building. That is “Improving management and operation of higher educational Institutions”. More specifically, this project seeks to build local capacity in LatAm HEIs to design and implement Learning Analytic tools to create and improve ”Quality Assurance processes and mechanisms”. Building the local capacity to the design, implementation and use of Learning Analytics tools will provide LatAm HEIs with a powerful tool to solve not only one problem, but any problem where data analysis could be used to inform decision-makers. The main impact expected from the project is the creation of local capacity to create, adapt, implement and adopt Learning Analytics tools to improve the academic decision-making process on LatAm HEIs.

To let this project succeed, a community of practice will be built, starting by different HEIs from LatAm and Europe that combine knowledge and experience. Concerning project partners, there are two universities from Chile: Pontificia Universidad Católica de Chile (PUC) and Universidad Austral de Chile (UACh), two universities of Ecuador: Universidad de Cuenca (UCuenca) and Escuela Superior Politécnica del Litoral (ESPOL) and three European universities: Universidad Carlos III de Madrid (UC3M), University of Edinburgh (UEdin) and KU Leuven (KUL) will be the members of the project consortium.
2 PROPOSAL DESCRIPTION

The main objective of the project is to improve the quality, efficiency and relevance of Higher Education in Latin America. Only by analyzing the different processes involved in higher education, the academic decision makers could understand and optimize these processes for the benefit of students and society. This project aims to build local capacity in in LatAm HEIs to create, adapt, implement and adopt Learning Analytics tools to improve academic decision making processes. These tools will facilitate the process and analysis of large amount of data produced by the different educational process that occur inside LatAm HEIs (registration, academic performance, online systems usage, etc.). Decision makers and stakeholders will use the output of these tools to inform and support their decisions. These evidence-based decision making process is bound to improve the performance and quality of the education inside the HEI.

To be able to develop the local capacity to create, adapt and use Learning Analytics tools in Latin America, we have defined four important milestones in order to achieve the main goal. These milestones are:

(1) A framework that describe the methodological, technical, institutional, ethical and communal aspects of the deployment of Learning Analytics in the context of LatAm HEIs should be developed by the project. The project will follow the example of what the SHEILA project did in Europe to gather information and opinions from key stakeholders in order to propose such contextualized framework.

(2) To test that the local technical capabilities are in place, the project will adapt two existing tools created originally in the context of Europe to the LatAm context. One will be directed to academic administrators and the other, to professors and counselors. Both of these tools will be piloted to test their efficacy to improve academic decision-making processes.

(3) The final result of the project will be the compilation of the LALA Handbook, a guide containing the LALA methodological framework, the Infrastructure recommendation and the adoption experiences and best-practices gained during the pilot. This handbook will be the guiding resources to any other LatAm HEI interested in adopting Learning Analytics to modernize their operations.

(4) During the project, a community will be form to continue the efforts of the project and to disseminate and exploit its outcomes. The LALA Community will serve as a communication channel to share experiences and tools after the project finishes.

3 METHODOLOGY

To ensure that the project will accomplish the milestones and the main goal, it was organized in a set of five stages: preparation, development, quality plan, dissemination and exploitation, and management.

3.1 Phase 1: Preparation

The project will start with a preparation phase to ensure the smooth flow of the progress of the whole project. This phase has two main parts:
a) **Set up of the project partners:** that consist in organize and setup tools to be able to work together in the project. This selecting the working teams in each institution, forming the steering committee and having a first face-to-face meeting (Kick-off meeting).

b) **Set up of the LALA Community:** an inventory of HEIs that have experimented or are interested in the adoption of Learning Analytics tools will be created. To achieve this, an invitation will be sent to the identified institutions to join the LALA Community forming meeting that will be organized by the project.

### 3.2 Phase 2: Development

This phase will focus on the development of a framework to facilitate the design, implementation and use of Learning Analytics in the context of LatAm HEIs. This phase has three main parts:

a) **Set up the LALA framework:** The LALA Framework will provide guidelines to facilitate the design, implementation and use of Learning Analytics tools to improve decision making in academic processes in the context of the LatAm HEIs. To create this framework there will be a set of meetings and remote work that will bring together members of the project, academic decision makers, professors and students to interchange ideas, opportunities and barriers for the implementation of Learning Analytics tools in LatAm institutions, based on a participatory design strategy. The methodology set by the SHEILA project in Europe will be contextualized to gather the opinions and information from all relevant stakeholders: First, there will be a systematic review of existing policies and adoption studies in LatAm higher education. Second, a group concept mapping involving experts in learning analytics. Third, interviews with leaders of higher education institutions in Latin America. Finally, two sets of surveys, one measuring institutional readiness and another directed to students and teaching staff.

b) **Adaptation of LALA tools:** Two Learning Analytics tools will be adapted and contextualized its guidelines. First, a dashboard application will be adapted from the results of ABLE project. The ABLE dashboard is currently used at KU Leuven to support student counseling sessions: both the student and the study advisor see an overview of results obtained throughout the program and can compare these results to results of other students. In LALA, this dashboard will be taken as a starting point. The dashboard will be re-designed to address the requirements and needs of Latin-American universities. The design and development process used in ABLE project will be replicated: The first step will be elaborate interviews with faculty members and study advisors to understand the needs and issues that need to be addressed by the dashboard. In a second step, a first prototype will be elaborated that will be evaluated with study advisors. In a third step, the prototype will be improved based on feedback of from study advisors. Think aloud sessions will be conducted with study advisors to identify potential usability issues and refine the design.

The second tool consist of an adaptation tools created in UEdin and UC3M to serve as Drop-out Early Warning Systems. In a first step, the project will elaborate interviews will be conducted with academic program coordinators. Input will be collected on the different data sources that can be used, as well as metrics that should be visualized in the dashboard. Design goals will be defined in this first step. In a second step, a first prototype will be developed that addresses these design goals. Data sources will be collected and automatic analysis techniques will be deployed that provide useful insight. In a third step, the prototype will be tested with academic program coordinators. A think aloud study will be
conducted to assess the usability and utility of the dashboard. This study will be used to identify potential issues and to refine the dashboard.

c) Piloting: The two Learning Analytics tools will be tested during a Piloting stage. During this stage, these tools will be integrated in the academic process of the LatAm HEIs. The Counseling Dashboard (CD) and the Drop-out Early Warning System (DEWS) will be integrated in the counseling sessions with students. By the end of the project, all the LatAm partners use this system as a regular tool for advisors or counselors. During all this process, data will be collected to evaluate the usefulness and impact of the Learning Analytics tools. The feedback obtained from the piloting will be used to improve both the LALA Framework. This new document, together with the description of the Learning Analytic tools (CD and DEWS) and the experiences gained during the piloting, will be compiled into the main outcome of the project, the LALA Handbook. This Handbook will be a guide to any other LatAm HEI to facilitate the adoption of Learning Analytics tools to improve their decision-making processes.

3.3 Phase 3: Quality plan

The purpose of this phase is to assure that the project has its expected impact and the activities fulfill their outcome as planned. The first part of this phase consists on the regular evaluation by independent party of the outcomes of the project. The external evaluation will be conducted by external experts once a year and its scope will be the results and impact of the project. These external experts will provide useful feedback to improve the project during its execution. The specific objective of the external evaluation will depend on the year when it is executed. During the first year, the external evaluation will be focused on the main outcomes of the project (LALA Framework and tools) to identify design flaws or opportunities for improvement. During the second year, the external experts will evaluate the piloting of the project to provide information about the impact on professors and students. At the end of the project, the external experts will evaluate the final impact of the project on LatAm HEIs. Second, as part of the Quality Assurance process, this phase also includes the design, update and enforcement of the Quality Plan. The purpose of these activities is to assure that all the activities and their outcomes reach an agreed level of quality and contribute to the success of the project.

3.4 Phase 4: Dissemination and Exploitation

Different activities, directed at different stakeholders will be conducted during the project. First, the conceptual, technical and methodological part of the project will be discussed at Educational Conferences to increase the visibility of the project and obtain valuable early feedback from educational experts in the region. Another approach to disseminate the result of the project will be a continuous Social Media campaign (including social network sites such as Twitter, Facebook, YouTube, etc.) to reach the general public and raise awareness in the society. To help with the dissemination and exploitation of the project results, each partner will organize national training days where professors will be trained in the LALA Framework for the creation of their own Learning Analytic tools.

Finally, to help with the continuity of the LALA Community that will provide sustainability to the project, two LALA Community events will be organized during the project. The objectives of these
events will be to showcase experiences and best-practices from academic and technical members of the LALA Community and attract new members from the participating public.

3.5 Phase 5: Management

The management of the project, will assure that the work in other packages runs smoothly and that any issue or conflict that arises during the execution of the project is solved. Management meetings will be held regularly. These meetings will be held face-to-face during other planned project meetings or virtually through the communication tools of the project. During the management meetings, the Steering Committee will review the status of the project and set the goals to be met in the next period. Also, the reached outputs will be analyzed and the Quality Plan will be update. This work package is also responsible for generating for the periodical project reports.

4 IMPACT AND EXPECTED RESULTS

The main impact expected from the project is the creation of local capacity to create, adapt, implement and adopt Learning Analytics tools to improve the academic decision-making process on LatAm HEIs. The outputs of the project will be used by four main beneficiaries: academic decision-makers, faculty, students and academic ICT providers. Decision-makers and faculty will use the LALA Framework to plan and design tools to help understand and optimize diverse educational processes. Academic ICT providers will also use the technical part of the LALA Framework to build interoperable tools that are adjusted to the needs of Decision-makers and faculty. Students will be the final beneficiaries of the improved decision-making processes, such as counseling or early feedback systems.

During the project, all those four stakeholders will be approached in the participating LatAm HEIs. Faculty and academic decision-makers will be reached through institutional and National training days and they will be involved in the adaptation of the LALA tools. Students will be reached to the application of the pilots in counseling sessions. Also, during the project, workshop events will be organized at the national and regional level to disseminate the results of the project to professors and academic authorities from other universities. Educational experts in Latin America will be reached through educational conferences presentations. Also we expect at least 8 large institutions in Latin America that regularly use Learning Analytics tools to take informed decisions, at least 2 Learning Analytics Tools has been adapted and developed in the context of the project by the LatAm HEIs, at least 300 decision-makers/faculty involved in the pilots, at least 5000 students involved in the pilots, at least 120 additional professors decision-makers trained and at least 6 presentations at Educational Conferences.

The main beneficial effects of the project will be: 1) At local level, institutions will improve their decision-making process through tools that facilitate informed decisions, 2) At Regional level, the LALA Community will have a networking effect to share best practices and experiences in the use of Learning Analytics in LatAm HEIs, 3) At an institutional level, a methodological framework would be available to adopt tools for the improvement of learning processes in higher education on a large scale, 4) At European level, the results of the project will help European HEIs to fine-tuned their own use of Learning Analytics and will provide new partners to further explore the field.
As expected results of the project, we have defined the following:

1. Create a LALA Community with interested LatAm HEIs
2. Propose a LALA Framework to facilitate the adoption of Learning Analytics tools in LatAm HEIs. This framework will be created using the SHEILA methodology.
3. Adapt 2 Learning Analytics tools (Counseling Tools from ABLE project and Drop-out Early Warning system from the UEdin and UC3M) to the LatAm context.
4. Pilot the 2 tools in the 4 LatAm partners
5. Create the LALA Handbook out of the experiences of the project.
6. Disseminate the project through Conference presentations, National training days, Regional workshops (ECTEL and LACLO) and LALA Community.

5 CONCLUSIONS

Given the important technological advances, HEIs are able to access an important amount of stored data that represent the way in which the teaching and learning process has taken place in the educational programs they offer. The analysis of these data helps to make better decisions to adopt strategies that allow the effectiveness not only of the institution, but also the effectiveness in the training process since the use of LA can enable the structuring of learning through a personal learning environment.

Along these lines, this paper summarises the LALA project for building local capacity in LatAm HEIs to design, implement and use Learning Analytics tools to support their decision making processes. The project is conformed by different HEIs from LatAm and Europe, which combine knowledge and experience: Pontificia Universidad Católica de Chile (PUC), Universidad Austral de Chile (UACH), two universities of Ecuador: Universidad de Cuenca (UCuenca) and Escuela Superior Politécnica del Litoral (ESPOL) and three European universities: Universidad Carlos III de Madrid (UC3M), University of Edinburgh (UEdin) and KU Leuven (KUL) will be the members of the project consortium.

The aims of the project rely on the possibility to develop the local capacity to create, adapt and use Learning Analytics tools in Latin America through the development of a framework that describe the methodological, technical, institutional, ethical and communal aspects of the deployment of Learning Analytics. Also, we will adapt two existing tools for the context of LatAm HEIs. As a result, a guide containing the LALA Methodology, the Infrastructure recommendation and the adoption experiences and best-practices gained during the pilot will be published in the LALA Handbook. During the project, the LALA community will be built to continue the efforts of the project and to disseminate and exploit its outcomes.

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