ABLE Project

2015-1-UK01-KA203-013767

Output O17

Report: Summarising report on learning analytics for the transition of SE to HE

Funded by the
Erasmus+ Programme
of the European Union

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This report will summarise the main project results. The report includes concrete guidelines for the different stakeholders. For more details, please refer to the other more specialized project reports. The report is publicly available on the project website and is incrementally updated every project year under the responsibility of the steering committee.

This output consists of two parts:

1) summary of main project results and
2) concrete guidelines for the different stakeholders,

This output is a result of the European Erasmus+ project ABLE (2015-1-UK01-KA203-013767)

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Summary of the overall project

The ABLE project set out to identify ways in which learning analytics could be used to support students' transition into the first year of higher education. The project team recognised that there were a range of factors associated with transition relating to personal mission, social integration and the academic experience[1]. It was also clear that the different national contexts profoundly changed the goals. In the UK, the primary focus related to student retention and success, in Belgium and the Netherlands, the focus related more to supporting students to choose the right programmes[2].

The team's preparatory work and early studies[3] showed that there was the clear potential for learning analytics to support student transition, but that there were significant challenges associated with factors such as ethics, institutional implementation, and the use of student data.

The project therefore had two key strands:

Firstly, the team developed learning analytics resources to use with students. We undertook two approaches:

- Work on an existing learning analytics resource at Nottingham Trent University (NTU)
- Develop a new resource at KU Leuven (KUL) and share the learnings and development process with the University of Leiden (UL)

Secondly, the team set out to test staff and student reactions to the way that these resources were to be used. Where possible we planned learning and feedback into subsequent developments.

Achieving the project goals

The early stages of the project focussed on understanding the role of learning analytics in student transition, identifying approaches to evaluate the work, and conducting research to better understand the different the national contexts[4]. The first of several surveys was conducted[5] and significant work was carried out developing the new learning analytics resource at KU Leuven and enhancing the existing learning analytics resource at NTU[6].

At the same time the project team built and developed learning analytics tools for use with students. By the end of the first year, KU Leuven had a learning analytics resource in operation (LISSA) and NTU had integrated some of the early findings from output 4 into an updated version of the Student Dashboard.

During the second and final years of the project, the team continued the dual approach of testing student and staff reactions to the use of learning analytics and seeking to project

[1] See Output 2 – literature review on student transition
[2] See Output 1 – report into national context
[3] See Output 3 – literature review about learning analytics
[4] See Outputs 1, 2, 3, 4, 5 & 7
[5] See Output 4 – student experience of transition
[6] This work is summarised in the case studies O8 and final outputs described in Outputs 9-13

manage the development of learning analytics resources. This work is described below, in the project outputs section.

Each partner's journey

Nottingham Trent University

NTU started the 3-year project with a learning analytics tool (the NTU Student Dashboard) already implemented across the institution. During the project, the project team has learned more about how this tool is used by different stakeholders, researched what people find useful about the tool, overseen a number of different development phases of the tool, and piloted a range of interventions based on the information generated from the tool. Furthermore, NTU has worked on embedding the tool further into institutional processes, by developing appropriate training materials to be delivered by the centralised training facility, by redefining the role of the internal governance group, and by specifying the use of the tool in university policy documents.

KU Leuven

KU Leuven started the project with experience in the academic field of learning analytics but no learning analytics tool and a institutional policy not mentioning learning analytics as a useful technology. During the project, the project team built a dashboard to address the needs of student advisors and students and developed it iteratively. KU Leuven consulted with staff and students to gain feedback on the design and use of the tool in the context of student advisor-student meetings. The dashboard was first piloted in a small number of programmes, then expanded across a wider base throughout the project, finally reaching 26 programmes, 118 student advisors, and more than 4000 first-year or bridging students. KU Leuven is currently seeking to expand from learning analytics being piloted locally to being managed centrally and incorporated into institutional policies.

University of Leiden

UL started the project with a willingness to trial learning analytics but no learning analytics tool. During the project, the project team consulted students and staff members about their thoughts on using learning analytics in the institution, sought teams in different academic schools to pilot the dashboard developed by KU Leuven at UL, and worked with the Student Information Systems (SIS) teams to get the appropriate data over to KU Leuven to configure the dashboards. However, despite the perceived willingness, the project teams faced a number of barriers that prevented learning analytics being piloted in the institution during the timeframe of the project. The future for learning analytics at UL is currently uncertain.

Please note that each institution's starting point is described in more detail in Output 6.

Project Outputs

The project outputs listed below summarise the work carried out. The outputs vary in size, but the team believes they provide a detailed and usable overview of the complex work involved implementing and evaluating the project. All such projects require input from experts and specialists who are not directly line-managed by the project team. We feel that this was particularly challenging for this project. In order to conduct the work, the team needed support from data specialists, IT professionals, academic advisers, tutors, and of course students themselves. The support is gratefully received, and we believe that

the input will in the long run benefit each institution, however, it also reinforced to the team just how complicated implementing learning analytics is.

In the original bid, the project team stated that they would work on the following themes:

1. Focus on the development of learning analytics (LA) to support the first-year experience
2. Identify strategies for integrating institution support around information generated by learning analytics
3. Strengthen our existing research into the first-year experience and students in transition and transfer the outputs to learning analytics interventions.
4. Provide recommendations and resources to the sector

The project outputs have therefore been listed against the theme, they most strongly align to. It is important to stress that there is significant crossover and most inputs provide evidence for all three themes.

1. **Focus on the development of learning analytics to support the first-year experience**
    a. Output O1 - first steps to analyse current position of partner institutions
    b. Output O10 - methods and tools to collect and utilise data
    c. Output O12 - methods and tools to visualise and analyse data
    d. Output O8[7] – institutional case studies:
        i. LISSA dashboard (KU Leuven)
        ii. LADA predictive dashboard (KU Leuven)
        iii. Adapting the LISSA dashboard (UL)
        iv. Student induction trial (NTU)
    e. Outputs O18 & O19 – project management and reporting documentation

2. **Identify strategies for integrating institution support around information generated by learning analytics**
    a. Output O3 - literature review on LA used to support student transition
    b. Output O8 – institutional case studies:
        i. Staff feedback (NTU)
        ii. Library interventions (NTU)
        iii. Mid-term reviews (NTU)
        iv. 'No-engagement' alerts (NTU)
        v. Non-submission trial (NTU)
        vi. Student adviser feedback & recommendations (UL)

3. **Strengthen our existing research into the first-year experience and students in transition and transfer the outputs to learning analytics interventions.**
    a. Output O2 - literature review on student transition
    b. Output O4 - research into transition in partner institutions

[7] In the original plan, the team had envisaged writing three case studies, one for each institution. However, it was felt that this made the case studies unwieldy and less immediately useful to anyone seeking to learning from the ABLE Project's experience. Therefore, the team has written eleven case studies covering different aspects of the research around, and implementation of, learning analytics at each institution. Nine of the case studies describe successfully completed project work or research, for example how learning analytics were used as part of new student induction (NTU) or lessons from training staff to use learning analytics (KU Leuven). However, the team wanted to be clear about the challenges of learning analytics and two case studies describe work that was not fully implemented: a new early warning alert (NTU) and adapting the LISSA dashboard for a new institution (UL).

c. Output O5 - baseline measurements of challenges in transition
d. Output O7 - strategy and tools to analyse LA interventions
e. Output O8 – institutional case studies:
    i. Staff feedback (NTU)

4. Provide recommendations and resources to the sector
    a. Output O6 - recommendations for using LA to support transition
    b. Output O8 – institutional case studies:
        i. Staff training (KU Leuven)
    c. Output O17 (this document) - summary report and guidance for stakeholders
    d. Output 20 - recommendations for senior managers using LA to improve student support
    e. Outputs O9, O11, O13 – open source LA dashboard on Github
    f. Outputs O14, O15, O16 – dissemination resources (workshop material, conference slides/paper, press articles)

A note on recommendations

The team has sought to include recommendations throughout the outputs produced. In particular, the case studies (O8) contain multiple recommendations for anyone interested in implementing learning analytics with first year students. However, in three documents we have sought to consolidate these sets of recommendations. It may be useful for the reader to understand a little more about these three reports:

- **O6 – Interim report**

  This report was written during the middle of the project and describes some of the significant challenges faced by the partners. In some respects, this document provides an overview for the implementation of *any* learning analytics processes. Whilst this is broader than the original goal, it reflects the scale of the problems associated with implementing learning analytics (even for pilot projects). This approach may also make the document more useful for a wider audience.

  The report was structured using an early version of the model that now forms the framework for the second half of this report.

- **O17 – Summarising report & recommendations for the sector**

  This report is designed to provide a short overview of the work carried out and develops recommendations about implementing learning analytics for a range of end users.

- **O20 – Recommendations for senior managers seeking to use learning analytics to change support systems**

  The final report is intentionally short and designed to highlight areas that need addressing if considering using learning analytics to change support systems. It is directed towards senior managers, but it may be a useful starting place for anyone seeking to embed learning analytics.

Summary

The twenty project outputs provide the reader with an overview of the work carried out between 2015/16 and 2017/2018. Each output is potentially useful to the reader to gain an understanding of the work and challenges involved in implementing learning analytics.

At the point of bringing together the findings, one insight particularly stands out: implementing learning analytics is challenging.

In the model used in the next section, the team identified challenges in six areas. These must be addressed whether one is implementing a pilot in one course, or a whole institutional tool for supporting transition into higher education.

Section 2

Concrete guidance for different stakeholders

Section 2: Concrete guidelines for the different stakeholders

The following section aims to provide readers with a series of guidelines about learning analytics. The guidelines are based not only on learnings related to specific project outputs, but also on those gained throughout the lifespan of the project as the team reflected on progress and evaluated the outputs. The format follows the essential structure used in Output O6 but has been amended slightly following discussions amongst the partners. Ethics & external environment has been added to the five points identified in O6.

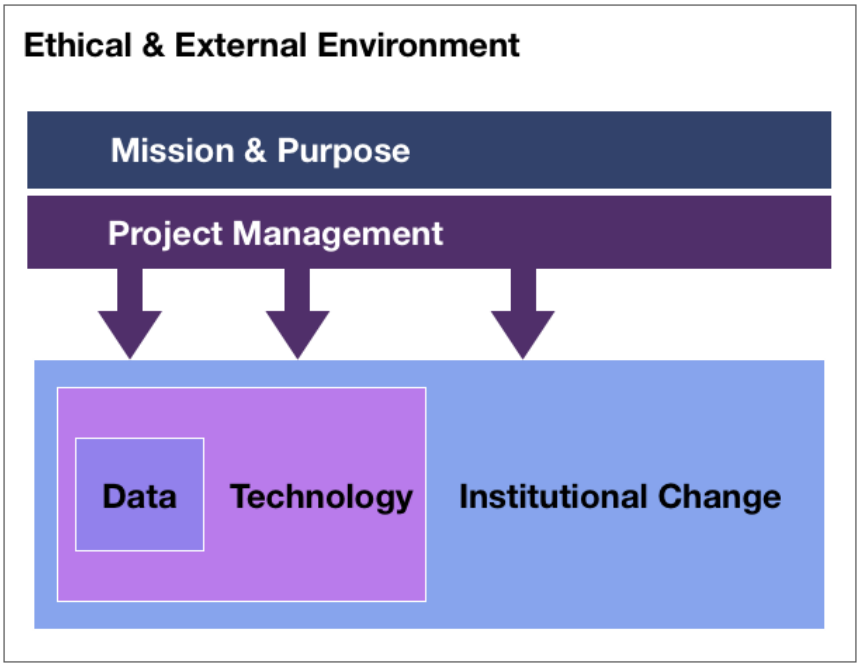

Figure 1: ABLE Project Learning Analytics implementation model

The revised framework is therefore:

1. Ethical & External Environment
2. Mission & Purpose
3. Project Management
4. Data
5. Technology
6. Institutional Change

The guidelines have been based on a key point in each theme, which is broadly outlined then broken down by stakeholder. The guidelines have been written as if directed towards a team responsible for implementing learning analytics, which will interact with the different stakeholders throughout the process. The stakeholders have been defined as follows:

- **'Senior managers'** have been defined as those within the higher education environment who are responsible for guiding the direction of the institution, making internal policies, and authorising and resourcing new initiatives.

- **'External technology providers'** have been defined as companies external to higher education institutions that are seeking to provide learning analytics tool/s to the sector.
- **'Internal IT departments'** have been defined as institutions' in-house information technology (IT) departments, that are responsible for technology and data management. They may also be responsible for in house learning analytics development, in which case the recommendations for external technology providers also apply to them.
- **'Staff users'** have been defined as university staff members who directly use the tool. It has been assumed that the staff member (for example a personal tutor) would use learning analytics to offer support or guidance to students, although support may only constitute a small element of their role.
- **'Students'** have been defined as those studying at university. It is assumed that the data used in learning analytics will be either student-generated or directly related to students. Students may be direct users of the learning analytics system or may experience learning analytics through interactions with staff users.

It should be noted that external policy makers or national bodies, such as SURF in the Netherlands or JISC in the UK, have not been included in the list of stakeholders. This is due to the limited experience of the project team of working with these stakeholders. Learning analytics bodies that extend beyond the level of individual institutions have clear benefits in terms of raising awareness and providing a platform for discussion and best practice sharing; however, there can also be tensions if these bodies are linked to particular suppliers.

The guidelines have been written based on the assumption that learning analytics will be used to support or guide students, and that the tool will be used by staff members in conjunction with students and/or by the students directly. For brevity, the guidelines have been associated with the stakeholder that the project team felt was most appropriate, although a number of recommendations apply across multiple stakeholders. The exact placement of recommendations may need to be adjusted based on an individual institution's approach to learning analytics and/or their internal structure.

The guidelines assume an institutional ambition for wide-scale implementation of learning analytics. The different stages of this process, from piloting, to full-scale implementation, to maintenance and sustainable development all present unique challenges. Whilst these stages require different focus and different resourcing, the basic principles underlying these phases appear to remain consistent, and thus the guidelines have not been split by the stage of implementation. It is often the case that the number of problems increases with the number of users. Wherever possible, sufficient time needs building to identify quirks and edge-cases during pilots to help mitigate against poor user experience during larger scale expansion.

Detailed discussions and recommendations about different elements of learning analytics can be found in the individual project outputs. These recommendations range in scale from high-level to very specific points that will have value to different readers. Such recommendations have not been replicated in the current output so as not to detract from the key points. In addition, an overview of all project output can be found in the appendix.

Mission and Purpose

It is essential to carefully consider the goal learning analytics will achieve and, specifically, how adopting learning analytics will achieve that outcome.

The mission and purpose of learning analytics must align with both the institution's vision, strategic goals and other new/ongoing initiatives. Ideally, a combination of end-user need and top-down steer should guide the use of learning analytics towards achieving a shared goal. Given that learning analytics will require buy-in from stakeholders across the institution, extensive consultation and communication is vital.

Senior managers

One of the most important roles of senior managers is to ensure that the vision described above is developed through consultation of stakeholders and is subsequently communicated to all stakeholders. There should be a focus on the mechanisms that enable action based on the insights from learning analytics.

External technology partners

Whilst providing fully bespoke LA solutions to every institution may be impossible, technology providers need to ensure that their product is compatible with institutional mission and purpose and tailored to the particular needs of the stakeholders within the institution.

Internal IT departments

University IT staff must understand the pedagogical practice behind the tool and how it should be used, as it adds important context to the work. This understand should be incorporated into the design of all processes associated with learning analytics, such as handling the underlying data, setting up data feeds, and alerting about potential issues.

Staff users

Staff consultation is essential. This allows staff expertise/knowledge to be incorporated in the design, builds staff-buy in, and provides the implementation team with a view on the extent to which embedding learning analytics may affect the nature of staff roles and their relationships with students.

Students

It is important to gain student buy-in early to prevent negative perceptions building up around the tool. Genuine student consultation may be the most effective way to achieve this goal. If the benefits of learning analytics are understood by students, this can act to help embed the use of learning analytics within the institution.

Project Management

Learning analytics implementation is complex and requires project management across three phases: feasibility testing/pilots, initial implementation and sustainable delivery.

Learning analytics tools are highly reliant upon data from a range of institutional systems. Both the data and the systems are likely to change over time, due to the dynamic nature of technology, and thus maintaining learning analytics should be considered an ongoing process. The field of learning analytics is relatively-immature, so continual developments based on new best-practice guidance and/or legislation around data use should be expected. The timing of any developments should be considered within the broader university context, e.g. term dates. Where developments are being made, capacity to incorporate stakeholder feedback should be built in.

Senior managers

In order to ensure reliable and accurate learning analytics tools that is used effectively, it is important to commit sustained resources across in data, technology, and institutional change (particularly staff development).

External technology providers

Technology providers need to recognise the importance to partner institutions of a full evaluation, including evidence of impact. Approaches to evaluation require planning from the outset in order to ensure institutional confidence with the resource is maintained.

Internal IT departments

The role provided by IT departments will change over the lifecycle of implementing learning analytics. Whilst different professional skills may be required for the different stages, it is essential that IS maintain responsibility for communicating changes to internal systems and the potential implications of these with stakeholders throughout.

Staff users

It is important that sufficient time is allocated to providing updated training and/or associated resources for the staff users involved. Appropriate communication channels should be sought for different types of developments.

Students

Student consultation should be sought wherever possible in the project management and implementation processes to ensure the resource is usable and meets the needs of the end users.

Data

The data underlying the learning analytics is as important as the tool itself.

Data needs to be reliable and accurate for people to trust it enough to act upon it and/or the insights it leads to. The data used in learning analytics is highly likely to exist within the institution for other purposes rather than being coded specifically for learning analytics. These purpose usually take precedence, and are managed by other data owners making changes to the data more unpredictable. In order to gain appropriate insights from the data it is important to contextualise it within the academic environment, for example by including an appropriate benchmark or historic data for reference.

Senior managers

Learning analytics systems may expose weaknesses within institution's data management and usage procedures. It is likely that the resource cost may include upgrading existing institutional data provision. Senior managers should be aware of the legal and ethical issues of using data to support students, and put appropriate measures in place to enable its use.

External technology providers

External technology companies ought to be aware of the diverse and dynamic nature of university data, contexts and systems. Quality checks should be established to monitor data and/or data feeds.

Internal IT departments

The processes for data generation, storage, cleansing, and retention must be understood and well-documented. Attention to detail is key, as innocuous changes can have a big impact. It is essential that staff serving an IS function play a key role ensuring the quality and consistency of the data is maintained.

Staff users

It is important that staff users are conscious of both the benefits and limitations of the data used. Staff should be encouraged to use their own knowledge and skills to add context and understanding to the data.

Students

It is important that the data sources used in learning analytics and the way these sources are used be transparent to students. There should be a means for students to report incorrect data and a facility to amend that data.

Technology

Technology is core to implementing learning analytics, however it is an enabler, not the end result.

Building an effective LA tool is clearly key. However, investing all resources in building a learning analytics technology and neglecting the systems to utilise the data it provides is ill-advised. The tool needs to present information in a way that is clear and accessible to users. It also needs to be robust, so users can have confidence in the tool. The tool is highly likely to use information that is at the end of earlier systems, making it vulnerable to upstream faults and potentially making it more difficult to build trust in the tool.

Senior managers

Senior managers ought to consider implementing learning analytics as a long-term technological commitment. Regardless of whether the tool is developed in-house or purchased from an external company it should not be considered as 'plug-and-play' as changes in both feeding IT and support systems are likely to be needed.

External technology providers

The data literacy levels amongst most end-users are likely to be extremely diverse, in both confidence and competence. It is therefore essential that technology providers focus on accessibility and ensuring that the data is visualised in a way that is easy to act upon. The end-users are likely to vary depending on the institution's approach to learning analytics, so the ability to personalise elements of the tool is recommended.

Internal IT departments

It is important that the connections that link learning analytics tools to other technology within the institution are reliable. These need reviewing as internal systems are updated and/or replaced.

Staff users

Institutions need to consider the additional challenges that using learning analytics tools may provide to staff members. These include the meeting ethical challenges presented and becoming familiar with, understanding, and acting whilst using a new technology.

Students

It is key that learning analytics tools are designed so that student users understand the technology, particularly if they are using the tool without guidance from staff members. Unintended consequences of presenting negative messages in learning analytics should be carefully considered and reviewed over time.

Institutional Change

Implementing learning analytics should be treated as an institution change project rather than a project to add a new tool: training and communication is key.

The benefits of learning analytics can only be realised when the end-users have the necessary knowledge and skills to act on the information provided. Users of learning analytics need a broad skill set: technical competencies, data literacy, and the ability to reflect and plan. The processes around learning analytics, such as student support mechanisms, are key to acting on the insights from learning analytics. All of the above requires training and communication.

Senior managers

The implementation of learning analytics should always be considered as a change management process. Training and communication should be resourced on an ongoing basis, and links to the overriding university mission and/or other initiatives should be emphasised in order to embed learning analytics into existing processes.

External technology providers

Providers need to recognise that learning analytics tool isn't just a tool being used in isolation. Allowing a degree of personalisation, contextualisation,and including space for help text and links to other resources can help with integration.

Internal IT departments

It is important that the range of areas of expertise required to implement learning analytics is recognised, and that there is a strategy to coordinate this. Creating a robust learning analytics tool may impose further requirements upon the data and systems management than historically required, and may necessitate different mechanisms for quality checks and stakeholder communication.

Staff users

Staff users are likely to have a variety of roles and varying degrees of confidence with using data to support students. Staff communication and trainings must acknowledge this complexity. It should cover how to use the tool, but also how to have a conversation about the data it provides and how to connect to other support systems.

Students

In order to be successful, students should be encouraged to self-reflect and self-regulate their behaviour based on the insights from learning analytics. Students need to know that the data only provides a limited view of who they are as a student, does not define their destiny, and need to be supported in making changes based on the insights provided.

Ethics and external environment

The ethics of using learning analytics are as important as the legalities. They need to be considered in relation to the external environment.

Whilst essential, making use of learning analytics is not simply a case of complying with the necessary legal requirements; it also needs to 'feel' appropriate to the end users. The sector, and society, are becoming increasingly aware of the use of data and potential for unintended or adverse outcomes. It is important to consider ethical practise as the legislation develops. In many cases, there is a tension between privacy and the desire to support students who may not know that they need support. The ethics of both the end goal and the process of achieving it should be carefully considered.

Senior managers

Senior managers are responsible for ensuring that the implementation of learning analytics is congruent with the institution's ethics. Ethics should be considered throughout the entire implementation process and stakeholders should be consulted on difficult ethical questions.

External technology providers

Learning analytics tools must, of course, be built to comply with legal requirements. In addition, tools should be adaptable to different interpretations of best practice for ethical use. This could include enabling a choice of data sources or language within the tool.

Internal IT departments

IT staff must be aware of the ethical climate, and take responsibility for complying with security and privacy requirements. Enabling an ethical use policy, for example, opt out, may require additional IS functionality.

Staff users

Staff users need to be made aware of the ethical issues of using data through staff development and guidance. Building staff awareness potentially also improves institutional ethical approaches to LA. Learning analytics training should include forums for discussing data-driven approaches to support and the risks associated with these.

Students

It is important that students feel comfortable with the way their data is being used. Students should be consulted if new data sources are to be included, rather than assuming consent for one type of data applies to other types of data.