



The “I”s have it: Development of a framework for implementing Learning Analytics

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Learning Analytics are increasingly becoming commonplace in tertiary institutions and there are many frameworks and implementation strategies that have been developed to assist institutions in effective take up. Most of these are aimed at an institutional level and at strategic development, often with a key aim of improving student retention. This paper briefly discusses and compares these frameworks and introduces an alternative, complementary framework that is aimed at a practical level of implementation for groups or teams, be this a discipline group or a project team. The framework is built on 6 “I”s – impetus, input, interrogation, intervention and impact, all within an institutional context.

Keywords: Learning Analytics, implementation framework, higher education, implementation model

Introduction

Higher education has changed significantly in recent decades with the increasing digitisation of administration, learning and teaching. The field of Learning Analytics (LA) has come to prominence over the past five years through its proposal that the data produced by higher education can be used much more effectively to improve higher education than it is currently the case (Siemens, Dawson & Lynch, 2013). Through efficient use of data it is claimed that universities can “improve teaching, learning, organizational efficiency, and decision making and, as a consequence, it can serve as a foundation for systemic change” (Long & Siemens, 2011, p32). The most recent Horizon Report for Australian Tertiary Education lists a “growing focus on measuring learning” as one of the top three trends, and LA on the one-year or less time to adoption horizon (Johnson, Adams-Becker, & Hall, 2015).

With the increasing adoption of LA, many frameworks and implementation strategies have been developed to assist institutions in effective take up. Most of these are aimed at an institutional level and at strategic development, with a theoretical or conceptual approach and often with a key aim of improving student retention. There are a number of frameworks at the general level and at the institutional level but a dearth at the level of departments. This paper aims to provoke discussion on how a shift can be made from a “top-down” institutional approach to a more distributed approach that empowers staff and encourages collaboration and sharing of practice.

Literature Review

Current literature reveals a variety of representations for models of LA implementation with cyclical, linear or combination models being used to discuss approaches that generally have either an outcomes or process focus.

The work of a current OLT Project led by Shane Dawson (2015) has identified two distinct clusters and approaches for implementation of LA in Australian universities. The first group which is outcomes focussed, gives emphasis to retention outcomes and cost savings and budgetary concerns and has limited reference to LA as a means to improve learning; whilst the second group is process focussed, with a “broader view of learning analytics and its application into learning and teaching practice.” (p 25). The project considers the benefits and limitations of both approaches and concludes that a combined model beginning with small projects that can demonstrate impact from pedagogical and technological viewpoints may be the most effective approach.

The process focussed approach allows for LA to realise its potential for evidence driven change in all levels of higher education and is the type of approach adopted in several other frameworks (eg

Campbell & Oblinger, 2007; Clow, 2012; Dron & Anderson, 2009; Elias, 2011; Siemens, 2013). The outcomes focussed view is typified by projects such as the OLT project titled Let's Talk Learning Analytics and Student Retention investigated institutional level implementation of LA, from the perspective of improving student retention. The project team has developed a framework that "supports systematic discussion and reflection around the use of learning analytics for retention purposes." (West et al., 2015, p 1).

A cyclical process is portrayed in several of the process focussed frameworks and models (e.g. Clow, 2012; Siemens, 2013) whilst some frameworks with either a process or outcomes focus have adopted a more linear approach with defined steps or stages (e.g. Campbell & Oblinger, 2007; West et al., 2015). Some process focussed frameworks have combined cycles and stages (e.g. Dron & Anderson, 2009; Elias, 2011). Whilst some of the process focussed models only include processes (Campbell & Oblinger, 2007; Dron & Anderson, 2009; Siemens, 2013); others include additional components such as people, including learners (Clow, 2012; Elias 2011) and resources such as organization, theory, computers (Elias , 2011).

There are also a smaller number of frameworks that adopt different approaches, referring neither to processes nor outcomes. The importance of different dimensions is discussed by Greller & Drachsler (2012) who outline a framework consisting of six critical dimensions: stakeholders, objectives, data, instruments, external limitations and internal limitations that can be implemented at multiple levels within an institution. Another alternative approach is offered by the IRAC framework (Information, Representation, Affordances and Change) developed by Jones, Beer & Clark (2013) which aims for user-centred design of analytics. This user-centred approach was further developed by Beer, Tickner & Jones (2014) who discuss three paths for institutional implementation of LA of doing it to, for and with teachers, and suggest a balance of the three is the most effective approach. What is common across the frameworks and models is the importance of action or intervention as part of a closing the loop process and situating all projects within the specific institutional context.

The "I" framework

Most of the above frameworks are theoretical or conceptual in nature with a focus on institutional level implementation and a description of the "what" of the LA process. They have also been written from a LA perspective by authors who have expertise and experience in this field. What is missing from these frameworks is a practical implementation strategy – the "how" of the LA process – and a discussion of questions that it would be beneficial to discuss at the school/discipline or team level. With this in mind the "I" framework is being suggested as an additional and alternative framework which builds on aspects of the above frameworks and situates the cyclical process of LA within the specific institutional context. Focusing on questions that can be discussed will encourage constructive conversations and help staff to focus on working together to ensure efficient and effective implementation.

Institutional context: includes the policies and strategic directions that have been set for implementation of LA. This context also incorporates the support structures, including technologies and /or data warehouses. Although discipline groups or project teams will rarely have the opportunity to have any input into this, they do though need to be aware of these and situate their implementation within these contexts.

When a team has resolved to implement LA and gained knowledge of the institutional context they can follow through the implementation framework by considering the following questions and taking appropriate actions:

Impetus: who will be driving the implementation and what are the specific questions to be addressed, for example is this related to student retention, student engagement with learning content or how are students performing on a particular quiz? From this an implementation plan can be developed that will address specific actions, timeframes and responsibilities. The implementation plan would also consider who and /or what will be influenced by this – will it be students (to become more responsible for their own learning) and or staff – to encourage interest in data and use of the data for positive change

Input: what data is available to address the question, who has access to this information and how do staff access this in a format that is easily analysed?

Interrogation: how is the data going to be analysed and interpreted and who will be responsible for this. Who will be provided with the results of the interrogation?

Intervention: What actions are planned as a result of the interrogation and who will be responsible for taking those actions?

Impact: How successful was the process of implementation and what was the impact of interventions? Depending on the results of this the process could be repeated, using similar impetus or a deeper level of investigation.

Whilst the framework is generally unidirectional it can be an iterative process returning to any of the early phase as reflection occurs within the impact phase.

Discussion questions

As part of the discussion for this paper the following questions will be raised to stimulate conversation:

- Is this something that non LA experts will be able to utilise? For example, is the terminology non-technical and is the framework compatible with current educational research?
- Is there sufficient or too much emphasis on all aspects of the framework? Some earlier models (eg Siemens, 2013) place a high emphasis on data including collection and acquisition, storage and cleansing, all of which would generally be an institutional level responsibility and hence included in the overarching institutional context for this framework. Whilst it is not intended that each stage of the “I” framework will have equal weighting, there does need to be a balance between the stages and that implementation will flow continually through the stages.
- Are there any dimensions missing from the framework? By building on a wide range of frameworks and models it is hoped that the “I” framework does encompass all the essential stages of LA implementation in a logical progression.

Visualisations of the framework will also be presented to elicit feedback on which best conveys the intent of the framework. As LA is a new field, information dissemination is growing exponentially and a limitation of this research may be that some new frameworks and models have been published since the submission of this paper, so it would be beneficial to know if there are other models or frameworks that have already been developed that have not been considered in this paper.

This preliminary description of the “I” framework has been developed to offer an implementation strategy for LA that can be readily adopted by small teams such as discipline groups or project teams. It is planned to introduce the framework to participants in a forthcoming PhD research project and to seek feedback on the suitability of the framework for specific contexts.

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