Chapter 23: Learning Analytics Policies

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ABSTRACT

More and more higher education institutions have been making use of learning analytics in the last few years. But despite an increased funding and more research in the learning analytics domain, there is still a lack of systematic and large-scale implementations of learning analytics. In order to improve learning analytics adoption and to establish it sustainably, higher education institutions need to align learning analytics-related activities with their goals and visions. Their making us of data requires a set of guidelines and principles, i.e. a policy, that fits their context and speaks to all involved stakeholders. Only then can the effective and responsible use of learning analytics be ensured and will higher education institutions be truly able to establish learning analytics in a sustainable way.

Keywords: Learning analytics, policy, adoption, impact

Learning analytics has emerged as an interdisciplinary field that brings together research and practice in education, psychology, and data science. It collects, measures, analyses, and reports data about learners in order to improve learning as well as the environments where it occurs [23]. Over the years, the NMC and EDUCAUSE Horizon Reports have seen learning analytics as an important factor when it comes to educational technology in higher education and it has been voted a key issue every year since 2011. In the 2019 EDUCAUSE Horizon Report [1], "analytics technologies" in general are put on the one year or less time-to-adoption line. Learning analytics specifically, however, is associated with "adaptive technology" which has fallen out of the priority due to limited impact observed so far. It is argued that this may be due to the elusiveness of learning analytics for many campus leaders and faculty because in many cases the skill to distinguish between types of learner data available is not developed enough yet. The report therefore stresses that higher education institutions "will need to develop these advanced analytic capabilities through innovative leadership, new computational technologies and systems, and a highly skilled workforce equipped for understanding and effectively sharing and using large and complex data resources" [1, p.23] and that analytics need to move from static and descriptive analyses to dynamic and personalized ones. The 2020 EDUCAUSE Horizon Report [9] does not follow the forecasting time-to-adoption structure anymore and instead focuses on current trends and portraying possible futures. For the technological trend category, "analytics and privacy questions" are seen as a trend and "analytics for student success" are deemed as one of six emerging technologies and practices that are believed to be having a significant impact on the future of higher education teaching and learning.

The question thus is how higher education institutions (HEIs) can be supported in employing and implementing LA to increase the quality of teaching and learning? What are the barriers that prevent data from being used systematically and effectively? How can the effective and responsible use of learning analytics be ensured? In order to address issues such as data quality, ownership, access, organizational culture, and expertise available to implement LA [7]and to tackle LA-associated challenges such as technical, cultural and social aspects [39], an institutionally wide strategy (i.e. a plan of action to achieve goals and objectives) is needed to build analytics mindsets, capabilities, and capacity for LA. But despite increased funding opportunities for LA as well as a rising number of research activities in the LA domain, there is still a lack of systematic and large-scale implementations of LA in higher education [16, 47, 46]. For HEIs to establish LA in a sustainable way, it is imperative that they align the adoption of LA with their institutional vision and goals [39]. Strategic planning processes are needed to overcome institutional resistance to innovation and change [24]. Ultimately, the harvesting, use, and dissemination of data requires an institutional policy (a set of guidelines and principles) that aligns with national and international legislative frameworks, so as to ensure an enabling environment for LA [33]). It is important to establish principles to guide stakeholders and encourage ethical use of data within an educational system where power is unequally distributed among different stakeholders [46].

1 CHALLENGES OF LA DEPLOYMENT

In the global landscape, the USA can clearly be identified as a leader in research publications about LA, followed by Spain, the UK, Australia, Germany, Canada, India, the Netherlands, Japan, and China [48]. Review studies have looked into the trends and perspectives of educational technology on a national level in five countries around the world (China, Germany, Japan, Italy, and the USA) [26] as well as the efforts for data-driven improvement of education in seven European countries (Austria, Denmark, Finland, Germany, Norway, Spain, and Sweden) [28]. While some studies have investigated a nation-wide LA deployment, e.g. the USA [3], Australia [10], New Zealand [25], and the UK [27, 38], the systematic adoption of LA in higher education is embryonic [47].

Institutional adoption of LA is influenced and can thus also be hampered by interactions of technical, social and cultural factors. Most cases of deployment of LA at HEIs are at one of the first three stages of the LA sophistication model [39] that in total consists of five stages, i.e. awareness, experimentation, implementation, organizational transformation, and sector transformation. So far, no large-scale systemic adoption has yet been reported. This is echoed by studies that describe the field of LA deployment as thriving but yet to mature [11, 43] and that stress the need for verification of LA's potential with more empirical evidence [15]. In a review of over 25 publications about the adoption of LA in higher education, only 6% of the studies were deemed scalable [47]. This complements the findings of a study examining over 520 publications where the majority focused on small-scale projects or independent courses [11].

Generally, the problems of institutional LA deployment in higher education can be narrowed down to four challenges [45]:

1. Stakeholder engagement and buy-in: barriers to LA adoption can be due to unequal engagement with or inclusion of key stakeholders during the planning and implementation stages leading to institutional resistance and unwillingness to change.

2. Weak pedagogical grounding: very often, learning data is collected and visualized simply because it is available, instead of considering pedagogical practices and educational theories to meet the stakeholders needs and basing design.

3. Resource demand: the success of LA deployment does not only depend on financial resources, but instead also needs to take technological as well as human resources into account as infrastructures need to be setup and maintained, expertise needs to feed into the design and model making, and staff and students need to be informed and trained.

4. Ethics and privacy: questions about privacy and ethics of data use, of what can and cannot be done, and which legal guidelines and laws have to be followed often make the deployment of LA difficult as the lack of examples in practice has left much space for interpretations of legal frameworks in different local contexts.

Over the years, a number of models and frameworks have been proposed to assist HEIs in their learning analytics adoption and to tackle the challenges associated with it. While some focus on the setting-up processes of learning analytics, others are geared towards ethics and privacy aspects, and still others address leadership and management or specifically promote stakeholder engagement.

For example, the generic Learning Analytics Framework by Greller and Drachsler [17] provides six dimensions to look into when developing learning analytics: stakeholders, internal limitations, external limitations, instruments, data, and objectives. Supporting HEIs to identify and evaluate their strengths and weaknesses when implementing learning analytics, the Learning Analytics Readiness Instrument [2, 29] focuses on the five components including ability, data, culture and process, governance and infrastructure, and overall readiness perception. Pardo and Siemens [30] gathered four principles (transparency, student control over data, right of access / security, and accountability and assessment) that can help HEIs to assess their current level of compliance in order to then possibly improve privacy-related issues. The ethical framework for HEIs by Slade and Prinsloo [40] consists of six principles: LA as moral practice, students as agents, student identity and performance are temporal dynamic constructs, student success is a complex and multidimensional phenomenon, transparency, and higher education cannot afford to not use data. Similarly, the eight-point DELICATE checklist (determination, explain, legitimate, involve, consent, anonymize, technical, external) by Drachsler and Greller [17] can be applied to facilitate trusted implementation of learning analytics.

In order to steer the adoption of learning analytics in HEIs when it comes to institutional management and leadership, Colvin et al. [10] highlight strategic capabilities (leadership, strategy, institutional readiness) and operational capabilities (capacity and infrastructure) as primary forces while Gašević et al. [13] break down systemic adoption into three areas: data and its limitations, models used for processing and analyzing data, and institutional transformation. Stressing the role of dialogue among different stakeholders, the framework by West et al.[49] is meant to structure and systematize discussion about learning analytics implementation and adoption. Similarly, OrLA by Prieto et al. [32] offers a communication tool to guide and support decision making about adoption and implementation of learning analytics. The work by Herodotou et al. [19] provides seven guidelines on how to overcome academic resistance: provide evidence, propose student support interventions, promote communication across stakeholders, use predictive analytics to inform decisions, mitigate teachers' resistance, allocate managerial time, and complement the teaching practice.

From all of these works, HEIs can draw much inspiration and support on how to face, tackle and overcome challenges of learning analytics deployment. However, these frameworks and models often only focus on some

aspects or provide general principles for a wide range of situations. In order for HEIs to be able to actually use all of these in a systematic and sustainable way, they need to adapt the principles, guidelines and models to their context.

2 CONTEXTUALISING LEARNING ANALYTICS POLICIES

The institutionalization of LA needs to be examined from micro, meso, and macro levels [34]). The macro level considers the habitus [42], i.e. a combination of experiences, perceptions, assumptions, values, and belief that shapes the worldviews of people in a particular social group, of an institution, which is influenced by institutional leaders as well as the national context. The habitus shapes people's perceptions and interpretations of data. It also defines a fiduciary and moral duty of educational institutions regarding the use of student data for LA. The meso level inspects the capacity of an institution in terms of its resource capacity to provide and sustain support for learners. At this level, the distribution of power in a complex social system can shape intentions and (in)actions of individuals in the institution. The micro level drills down to factors that affect learning motivations and outcomes. For example, the quality and relevance of data are crucial to the representation of learning, the psychological attributes and social interactions of individuals both contribute to successful learning, and the structural elements in a society may constrain learner agency and self-efficacy. Thus, the success of LA can depend on the interplay of factors on the macro, meso, and micro levels of an institutional context.

The impact of contextual factors on LA adoption and success cannot be overlooked when developing institutional strategy and policy. Macfadyen et al. [24] point out that HE is an interconnected system and any new change introduced to one area of the system can trigger unanticipated consequences in the other areas, and an institution's resistance to change is usually a result of a mix of political, social, cultural, and technical norms. Therefore, to cultivate an adaptive attitude and positive thinking about the changes that accompany LA, institutions need to ensure that wicked issues (as discussed in the earlier section) with LA are addressed in a policy that reflects the institutional goals. Importantly, the policy needs to be 'sensitive' to an institutional context in order to guide decision making and ensure desirable and accountable outcomes of LA.

In a complex social system, people are arguably the most crucial factors to consider when moving innovations from the lab context to operation at scale. The readiness of an institution for LA is not only determined by the availability of technological resources and data, but also by a culture of using data to inform decisions, the capability of making sense of data and taking action accordingly, the awareness of ethics and pedagogical implications, and leadership to facilitate collaboration among different stakeholders [2, 17, 29, 46]. As LA implementation involves a wide range of stakeholders including professional staff (e.g., IT, student advisors, and legal representatives), academics, managers, students, and external parties (e.g., service providers), the development of LA policies especially requires careful consultation across stakeholders so as to cultivate a shared vision. As Dollinger and Lodge [12] argue, inclusivity in the process of LA adoption may balance the unequal distribution of power in an institution and that primary stakeholders (students and teachers) are more likely to generate trust and empathy towards the institution. It is especially important to understand the interests and concerns of different stakeholders.

The concept of habitus [42] can be used to understand the differences in perceptions of LA among different stakeholders; that is, expectations are shaped by personal experiences in the institution. A study by Hilliger and others [20] shows that interest in LA is influenced by people's expectations of each other in the institution. While managers, teachers, and students expressed unanimous agreement that LA can enhance the quality of feedback for students, teachers mentioned the benefit of helping students develop study skills more frequently than the other stakeholders. In contrast, students commented on the use of LA to improve teaching skills more frequently than the other stakeholders, and managers talked about using LA to evaluate teaching performance and the effectiveness of interventions much more frequently than the other stakeholders.

Although there is shared interest in using LA to enhance learning, stakeholders tend to perceive the usefulness and disadvantage of LA based on their roles and responsibilities in the institution. Thus, it is not surprising that managers are particularly driven by key performance indicators (KPIs) such as student retention and success [4, 46] and that their approach may vary between solely focusing on monitoring and measuring student progress [51] and connecting the observed phenomenon with teaching, learning and student experience factors [10]. From the perspective of teachers, interest in LA focuses on improving teaching effectiveness and support for learning. The approaches for teachers include identifying connections between course design and learning patterns [21, 44, 46], providing timely and personalized feedback [31], and identifying opportunities for interventions [5]. From the student point of view, interest in LA focuses on enhancing learning experience and outcomes. Perceived benefits include receiving support that addresses gaps between learners due to different academic, cultural and socioeconomic backgrounds [46], developing personalized relationship and a sense of belonging through receiving customized messages about their learning [35], and improving self-regulated learning skills by monitoring their own learning progress more closely [31, 35, 50]. However, it is worth noting that different student populations, e.g., campus and online cohorts, have distinct needs for and interest in LA [31, 50]. A LA policy needs to reflect the interests of key stakeholders to establish a common vision and a sense of ownership.

Importantly, the principles and guidelines in a LA policy need to address concerns and risks perceived by different

stakeholders. While managers are generally concerned about institutional capacity (e.g., available funding, relevant expertise, data culture and literacy, technological infrastructure, and competing priorities) and legal obligations [3, 46], teachers frequently express worries about inadvertent impact on students (e.g., demotivations, stereotypes, agency compromise, unequal treatment, and privacy invasion) and impact on themselves (e.g., workload, responsibilities, and performance monitoring) [21, 31]. Similarly, students share concerns about the potential negative impact on them and highlight the need for informed consent [35] and secure processing of data [50]. The variations of these concerns show the influence of personal experience and beliefs on perceptions of LA. It is thus important to consult relevant stakeholders and incorporate their views into a LA policy.

An example approach to creating policy in HEIs for LA considering factors of contexts and stakeholders is the one taken by Tsai et al. [44] in Europe. Building on the RAPID Outcome Mapping Approach [16, 24, 52], Tsai and others [46] developed the SHEILA policy framework [1] based on a series of consultation with LA experts and key stakeholders including managers, teachers, and students from over 20 European countries. The framework contains a repository of LA adoption experiences in Europe, organized by lists of key actions, prominent challenges, and policy considerations in accordance to key dimensions of policy development: 1) map political context, 2) identify key stakeholders, 3) identify desired behavior changes, 4) develop engagement strategy, 5) analyze internal capacity to effect change, and 6) establish monitoring and learning frameworks. The same approach has also been applied in the Latin American context to identify needs and directions for policy development in higher education [36].

It is worth noting the role of communication with key stakeholders not only during the process of developing a policy, but also after the process to ensure shared understanding and to review the relevance of the policy. A study on LA experts' views towards essential elements of a LA policy shows that while privacy and transparency are rated as the most important elements, they are also considered the easiest to implement in the policy context, e.g., describing data protection measures clearly [37]. The SHEILA framework thus emphasizes the need to solicit feedback on the implementation of a written policy to bridge gaps between conceptual guidelines and practical implementation. Other studies have also argued the importance of two-way communications to avoid equating transparency with understanding [46] and address a prevailing phenomenon of privacy paradox (individuals' action contradicts their protective views of personal data) among students when it comes to sharing data for LA [41, 50].

3 LA POLICY CASES IN HIGHER EDUCATION

A review done in 2016 was able to identify only four HEIs that had developed their own institutional policy for learning analytics [43]. Apart from categorizing these policies according to different aspects such as strategy, obligations, privacy protection and data management, the authors identified six challenges of LA adoption in higher education: leadership involvement, LA-specific policies, communication between stakeholders, pedagogy-based approaches, skills for learning analytics, and evidence of effectiveness. The analysis showed that these policies "have not given enough considerations to the establishment of two-way communication channels and pedagogical approaches. Most policies lack guidance for the development of data literacy among end-users and for evaluation of the impact and effectiveness of LA" [43, p.241]. Since then, other HEIs have developed their own institutional policy or are currently in the process of doing so. Often, these policies make use of the SHEILA framework and also try to address the issues that were previously not taken into account enough.

The University of Edinburgh, for example, had been observing the Jisc Code of Practice [22] for LA related practices until a decision was made in 2016 to develop an institutional policy [2] that would meet the needs of key stakeholders within the University. A task group was then established to undertake a wide range of communication and engagement activities, including discussion at Senate, discussion at the Senate Learning and Teaching Committee (LTC) and Knowledge Strategy Committee (KSC), meetings with Schools, Colleges, and other stakeholders. Moreover, a sample-based student survey and a staff survey, and focus groups with staff and students were conducted to understand interest and concerns about LA among primary stakeholders using the same instruments adopted to develop the SHEILA framework. Considering the feedback received from the consultation, the task group developed a set of policy principles and purposes [3] in 2017. The seven principles reflect interests of multi-stakeholders highlighted in the SHEILA framework, including stating the vision to support students through human interventions, acknowledging limitations of data and potential negative impacts of LA, affirming ethical conducts and support resources, and promising not to monitor staff performance.

Similarly, and inspired by many international examples [22, 14, 6] a German consortium consisting of the University of Frankfurt, the Technical University of Darmstadt, and the DIPF | Leibniz Institute for Research and Information in Education aimed at adopting Learning Analytics according to the SHEILA framework [44]. The consortium initiated in 2018 the DELTA project [4] (Towards Digital Ed-

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[1]The SHEILA framework web tool: https://sheilaproject.eu/sheila-framework/

[2]https://www.ed.ac.uk/academic-services/policies-regulations/learning-and-assessment/learning-analytics

[3]https://www.ed.ac.uk/files/atoms/files/learninganalyticsprinciples.pdf

[4]https://www.dipf.de/en/research/current-projects/towards-digital-education-with-modern-learning-technologies-and-assessment-approaches

ucation with modern Learning Technologies and Assessment approaches), that aims to gather empirical insights for the adoption of digital learning and learning analytics according to the SHEILA framework. In this context the DELTA project interviewed students of all faculties about the opportunities and challenges for Learning Analytics and other digital tools on the campus. Among this qualitative approach, the consortium also gathered quantitative data with a Group Concept Mapping study with all stakeholders of the University (students, faculty staff, administrators, teachers, professors) [8]. Furthermore, the SELAQ survey from the SHEILA project [50] is being applied to investigate the expectations of the students at the local campus as well as broadly in Germany. Results will then be compared to those from international students. Based on these qualitative and quantitative insights the consortium developed a first code of conduct on learning analytics in Germany [18].

Monash University started its institutional adoption in 2018 by creating a Working Group that was approved by the University Learning and Teaching Committee and the Academic Council to oversee the process. The group reviewed existing work in LA and decided to follow the SHEILA framework. To bootstrap the adoption of LA and enable the launch of several institutional projects, the working group defined the principles and purposes for LA by following the model of the LA policy of the University of Edinburgh. These projects were part of other institutional strategies - digital learning and student retention. As part of the process, Monash University adopted the tools and instruments of the SHEILA framework to engage students. The university has developed a novel instrument to assess expectations and requirements from academic and professional staff about LA. The instrument, created in the form of vignettes, solicits the participants' functional, ethical, privacy, and other expectations. This approach will enable the institution to identify both the priorities to be set by the university, and outline the specific details of both the institutional strategy and policy. This example emphasizes the need to closely tie the work on the policy and strategy development together with implementation of specific tools and uses of LA in a HEI.

These examples show that HEIs can actively formulate their policies in a context-based way, i.e. fitting their institution (or set of institutions) specifically. The leadership is strongly and actively involved in the set-up of the policy as well as its application. Also, stakeholder-driven development is seen as an important issue as communication between stakeholders is endorsed and improvement of student experience and learning processes are the targeted goals. Transparent data collection and usage as well as human control are core principles in addition to the HEIs' commitment of providing opportunities of skill development to staff and students. Guidance for measuring and evaluating the impact and effectiveness of learning analytics are addressed, i.e. the need for validation of the benefits for chosen approaches is stressed.

CONCLUSION

Looking at it from afar, one might get the impression that

not too much has changed in the last few years when it comes to learning analytics adoption and that the same issues, challenges and problems that had to be tackled five or even ten years ago are still the same. While this does hold true in some regards, e.g. as many HEIs are still piloting learning analytics on a small scale and no large-scale systemic adoption of learning analytics has yet been reported, HEIs can now draw inspiration and support overcome challenges of learning analytics adoption and implementation from works and best practices of others.

Learning analytics is now more and more geared towards improving students' success as well as teaching and learning processes instead of analytics on an institutional level. The need for leadership support and collaboration among all stakeholders involved has been recognized in order to formulate contextualized strategies, principles, guidelines and ultimately policies. HEIs thus need to reflect on the needs unique to their situational contexts to identify goals and objectives for LA, and ensure that LA deployment is governed by a comprehensive policy that speaks to all relevant stakeholders. Only then can they make decisions on what to do and what not, i.e. they need to find their own learning analytics strategy and create their own, personalized institutional learning analytics policy. Only then can the effective and responsible use of learning analytics be ensured and will HEIs be truly able to establish learning analytics in a sustainable way.

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