SHEILA Framework v.2

The second version framework updates the previous version that was released in July 2017 based on interviews with institutional leaders. This framework is informed by results of a group concept mapping activity with 29 international learning analytics experts, 18 student focus groups from four European institutions (n=74) and 16 staff focus groups from the same institutions (n = 59).

Three key elements are included in this framework, including action, challenges, and policy.

- **Action**: strategic action points to take in each step of the ROMA framework. Items are grouped under themes, which are organised alphabetically – culture, ethics & privacy, financial & human resources, infrastructure, internal & external support, methodology, purpose, and stakeholder engagement,
- **Challenges**: potential challenges that exist in each step of the ROMA framework. These challenges fall in categories that are organised alphabetically – capabilities, culture, ethics & privacy, infrastructure, management, methodology.
- **Policy**: questions to guide the development of a policy that addresses the listed action points and challenges. These questions fall in categories that are organised alphabetically – data management, methodology, policy management, purpose, and stakeholder engagement.

Dimension 1 – Map political context

ACTION	CHALLENGES	POLICY
Methodology - Consider contextual elements (e.g., institutional size, structure) to identify opportunities for learning analytics. - Identify opportunities to build learning analytics upon existing projects or practice. *Purpose* - Identify internal and external drivers for learning analytics (e.g., problems to solve or areas to enhance). - Identify the university's learning and teaching strategies.	*Infrastructure* - Existing solutions in the market mainly focus on addressing retention problems. - There is no one-size-fits-all model, even within one institution (different disciplines and learning modes). *Management* - Learning analytics competes with other institutional priorities. *Methodology* - Institutions feel pressured to adopt learning analytics even though the needs for it are unclear. - Wrongly assume that learning analytics can solve all problems without having	*Purpose* - What are the reasons for adopting learning analytics (e.g., to improve teaching and learning)? - Which problems are to be addressed by using LA? - How do institutional objectives align with personal benefits for teaching staff and students?

ACTION	CHALLENGES	POLICY
	identified key questions to answer (data driven approach). • Learning analytics does not generate new insights into the understanding of learning or teaching.	

Dimension 2 – Identify key stakeholders

ACTION	CHALLENGES	POLICY
Stakeholder engagement • Identify primary users of learning analytics (e.g., students, teaching staff, and senior managers). • Identify senior management team (e.g., vice-chancellors, principals, provosts). • Identify professional teams (e.g., IT, legal team, strategy team, Student Support, Student Registry, library). • Identify academic teams (e.g. Learning & Teaching committee, Digital Learning Committee, research project teams) • Identify external partners (e.g., researchers and service providers) • Identify internal advocates of learning analytics among members of faculties (bottom-up approach). • Identify required expertise (e.g., learning analytics expertise, IT expertise, statistical expertise, educational expertise, psychological expertise)	*Ethics & privacy* • Risk marginalising hard-to-reach students by drawing a distinction between students who opt out and those who opt into a learning analytics service. • The choice of opt-out or not opt-in could affect those who choose to opt in regarding the quality of data and services provided. • Data sharing (particularly with external parties) requires a careful check of security issues and breaches of privacy. *Management* • Define ownership and responsibilities among diverse professional groups within the university.	*Data management* • How will consent be obtained and when? • What are the circumstances where obtaining further consent is necessary? • Is there an option to opt-out of (or opt into) any data collection and analysis? When will the option be available? • Will students have a free choice of whether or not to accept interventions based on analytics? • Who can access data? • Who owns data? • How will anonymity policy be applied to the processing and presentation of data? • Can collected data be edited or deleted upon request? • Will data be shared with researchers? • Will data be shared with external parties? Is it justifiable? • Who is the data controller? *Methodology* • Whose data will be collected? *Stakeholder engagement* • Who is the policy for? Whose working activities will the policy shape?

		• How will responsibilities be defined for each stakeholder? • Will learning analytics exclude certain groups of students? Will there be mechanisms to address inequality? • Will the policy cover those who choose to opt out (or not to opt into) a learning analytics service? • How will the current policy be communicated to different stakeholders?

Dimension 3 – Identify desired behaviour changes		
ACTION	**CHALLENGES**	**POLICY**
Purpose • Identify expected 'changes' to the current context and key stakeholders (e.g., teaching staff and students). • Identify areas where different stakeholders will be supported by learning analytics (macro level – institution, meso level – department/ programme, and micro level – teaching staff and students). *Stakeholder engagement* • Consider responsibilities and implications for all stakeholders. • Mind inadvertent consequences and make sure the benefits of learning analytics to students outweigh risks.	*Capabilities* • Immature skills of interpreting data lead to wrong decisions. *Ethics & privacy* • People mistrust the result of an analysis if the process is not transparent or if the analytical model is too complicated to understand. • Unethical profiling of students may occur when selecting those that are more likely to succeed. *Infrastructure* • Learning analytics can reveal what was/is happening and predict what is likely to happen, but it may not explain the observed phenomenon or provide a direct solution. *Management* • Students may be prone to choose subjects where they are likely to perform well. • Users may game a LA system.	*Methodology* • How will transparency be achieved throughout a project cycle (data collection, analysis, and usage)? *Purpose* • What positive changes will learning analytics bring to the current situation (e.g., learning and teaching landscapes)? • Why are these changes important to us? *Stakeholder engagement* • What are the mechanisms to deal with inadvertent consequences? • Who will benefit from learning analytics? • How will the purpose and functions of learning analytics be communicated to primary users?

	• Those who need support may not necessarily make use of information from learning analytics. *Methodology* • An experimental approach is susceptible to a sense of uncertainty about the return on investment.	

Dimension 4 – Develop engagement strategy (*tends to iterate with Dimension 5)

ACTION	CHALLENGES	POLICY
Ethics & privacy • Consult relevant policies and codes of practice (e.g., Jisc's *Code of Practice for Learning Analytics*, and data protection policies) • Consider establishing an ethics committee. *Financial & human resources* • Seek funding. • Appoint specialists to lead learning analytics projects. • Establish a diverse working group (including teaching staff and students) and define a clear leadership structure. *Internal & external support* • Align learning analytics with the wider institutional strategies or introduce learning analytics into the university's strategy. • Embrace the whole system with guidance from key leadership. • Engage with research projects locally or through collaboration with other institutions.	*Ethics & privacy* • Learning analytics may induce fear and discomfort about surveillance. • Surveillance leads to conscious or unconscious behavioural alteration that is against the goals of learning analytics. • It is arguable to base predictive models on pre-determined factors, such as demographic characteristics. • Predictive models may result in unequal access to learning or support resources among students. • Learning analytics profile students and provide unequal support as a result (e.g., focus on struggling students and ignore others). • Learning analytics removing student agency from them by drawing attention away from their' own responsibility for learning. • There are conflicts between good intentions to support students and unintentional intrusion into privacy. *Management*	*Methodology* • What kinds of data will be collected to achieve the identified objectives? • When will data be collected? • What is the scope of data collection? • What are the methods of data collection? • What kinds of data will be presented? How? To whom? • How will the results of analytics be interpreted within the context? What kinds of expertise needs to be involved in this process? Does it include teaching staff and students? • How will the results of analytics be communicated in a way that motivates learning? • How will resources be distributed efficiently and fairly as a result of the analysis of data? • Will there be interventions based on analytics? What are the circumstance?

Methodology
- Engage with existing LA cases and literature.
- Consider phases of implementation (e.g., explore data, carry out pilot projects, seek feedback from users, and develop a policy for the adoption of learning analytics).
- Decide the scope of the project – the range of data.
- Choose analytical models and define metrics.
- Select data that will be fed back to different stakeholders.
- Consider providing a safe environment (e.g., a sandbox) for testing or research purposes.
- Decide forms of interventions (e.g., automatic systems, personal contacts, learning resources).

Stakeholder engagement
- Raise awareness and understanding of learning analytics among teaching staff and students through publicity and meetings/ workshops/ conferences.
- Discourage teaching staff and students from gaming the system.
- Establish communication channels between different stakeholders across the institution.
- Consider the best ways to present analytics results (e.g., visualisation).

- Overloading primary users with too many messages about analytics results.
- Strict data protection laws could restrict the way learning analytics is operated.
- Disengaged students remain hard to reach.

Methodology
- Over rely on data and fail to consider the experience and knowledge of instructor/ tutors about students and course designs.
- Feedback is provided without proper support, which leaves students in anxiety or complacency, thereby demotivating them.
- Focus on identifying students at risk and overlook the pedagogical design of curriculum or learning support.
- Peer comparison may demotivate students.
- Unsuccessful students may be discouraged by warning messages.
- Learning analytics is used as a metric to judge students and teachers rather than evidence to support learning and teaching.

- Will learning support and resources be made available to all students or only targeted students?
- Who will decide the forms of interventions and triggers?
- How will interventions take place?
- Who will be affected by the interventions?
- Who will oversee ethical conducts related to learning analytics?
- How will students' responsibility for learning be highlighted and considered in the design and implementation of learning analytics?

Purpose
- What are the objectives for learning analytics? How do they align with the institution's vision for education?
- Will learning analytics be used as a management tool to monitor students or staff?
- Will learning analytics be used as a deficit model targeted at supporting students at risk of failure?

• Provide training for users (e.g., how to operate the tools, how to interpret data, how to transfer data into action). • Provide opportunities for students to feedback on results of analytics. • Invite teaching staff to contribute their professional knowledge to the design and implementation of learning analytics (e.g., guide students to reflect on possible ways to act on the results of analytics).		

Dimension 5 – Analyse internal capacity to effect change

ACTION	CHALLENGES	POLICY
Culture • Evaluate institutional culture (e.g., trust in data and openness to changes and innovation). *Ethics & privacy* • Evaluate existing legal framework and its applicability for learning analytics. *Financial & human resources* • Evaluate financial capacity. • Evaluate human capacity (e.g., data literacy, relevant expertise, staff workload, opportunities for skill transfer). *Infrastructure* • Evaluate technological infrastructure. • Evaluate resources available for primary users to uptake learning analytics (e.g., access to digital devices). *Methodology*	*Capabilities* • The maturity of data literacy varies among stakeholders and faculties. • The lack of critical self-reflection skills reduces the chance to benefit from learning analytics. • The understanding/ interpretation of data protection regulations vary among legal officers, researchers, and teaching staff. • Digital capabilities affect the desire to opt into a learning analytics service. • Limited awareness or discussion regarding privacy and ethical issues cripple the adoption of learning analytics when issues arise. • The difficulty of comprehending algorithms leads to disengagement with or distrust of learning analytics among primary stakeholders.	*Data management* • How will data be stored and disposed? • How often will the efficiency and security of existing data infrastructure be evaluated? *Methodology* • How will data integrity be achieved? • Is there an application procedure for using learning analytics for research or teaching purposes? Are the procedures different? *Policy management* • Are there related policies in the university that the policy sits alongside/above/below? • Are there any national/international policies that this policy has to adhere to? *Stakeholder engagement* • What training will be deployed to scale up data literacy and incorporate learning

• Establish indicators of data quality and system efficacy • Evaluate risks.	• Results of analytics are interpreted and communicated by people without proper understanding of data (e.g., fail to contextualise data or interpret it with sufficient statistical knowledge). *Culture* • Institution-wide buy-in is hard to reach. • Instructors are more interested in establishing a research profile than enhancing teaching and learning. • Senior managers are more interested in financial benefits to the institution than the benefits in enhancing learning and teaching. • There is unequal engagement/ interest in learning analytics among primary users (e.g., differences in gender, age, and disciplines influence the degree of interest). • There is no common understanding of learning analytics among stakeholders at different levels (e.g., managers, teaching staff, IT officers, and students). • Concerns about data protection hinder buy-in. • Reluctance to change is present among some teaching staff (e.g., try new or unfamiliar technologies, or change teaching styles). • Training could be difficult to deliver when staff lack time. • Teaching staff perceive learning analytics as a burden rather than a tool to improve	analytics into daily practice? Will the training be compulsory for any stakeholder? • What communication channels or feedback mechanisms will be in place? • How will the implementation address the problem of time poor among teaching staff? • Will the design of selected learning analytics tools address teaching and learning needs?

	efficiency and efficacy of teaching (e.g., pressure on time, pressure on providing personalised support to a large group of students, analytics tools are not intuitive or applicable to specific courses). *Infrastructure* • Some useful data remains inaccessible. • Data is held in silos. • Data is fragmented. • Data is noisy. • Setting up a learning analytics environment is costly. *Management* • 2018 GDPR requires changes in existing practice and system (e.g., coping with individual opt-outs). • Central steering groups and individual project groups do not coordinate. • Engaging students with institutional policies in an informed way.	

Dimension 6 – Establish monitoring and learning frameworks

ACTION	CHALLENGES	POLICY
Methodology • Set up measurable milestones. • Establish qualitative and quantitative indicators of success. • Develop methods to triangulate analytics results. *Stakeholder engagement* • Seek feedback from primary users through various channels.	*Culture* • Low participation of primary stakeholders in top-down consultations (e.g., survey and meetings). *Management* • Manage expectations (e.g., deliverables and impact). *Methodology* • It could be hard to isolate learning analytics from parallel projects that	*Methodology* • What defines success or failure? How will success be measured? What are success indicators? • Who defines success measures? What expertise needs to be involved? • When will evaluation take place? • Who will carry out the evaluation of impact?

	• support the same goals (e.g., enhance learning and teaching) when measuring success. • Fail to recognise and address limitations of data and analytics models (e.g., uncapturable factors of learning, ineffective metrics, existing bias, inaccuracy of predictions). • Overly depend on data that is conveniently available to justify a learning phenomenon. • Fail to contextualise data. • Wrongly assume causal relationship between learning outcomes and interventions or engagement patterns. • Interventions introduced to one course may have negative impact on student engagement in another course. • Emphasise measuring output (learning or teaching performance) and overlook developing input (e.g., strategies, skill development) • Overlook the differences between individuals in their learning or teaching approaches. • Definitions of learning vary, which impacts the way data is collected, analysed, and interpreted.	• What are the limitations of learning analytics (what is learning analytics not meant to do)? • Will any access to data lead to stereotypes and biased results (e.g., marking exams or assignments biasedly)? • Are there any measures to ensure that students are equipped with sufficient knowledge to make opt-in/out decisions? *Policy management* • How often will the policy be reviewed and updated? • Who will be responsible for the policy?

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