Report

Continuous Professional Development for Learning Analytics: a needs analysis

Scholarship in Teaching and Learning funded by the National Forum: Strengthening Ireland's evidence base for teaching and learning enhancement in higher education



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Executive Summary

Overview: Daltai (Irish for "Students") was a collaborative project run by TU Dublin and GMIT, and funded by Ireland's National Forum for the Enhancement of Teaching & Learning. It investigated how to improve digital proficiencies amongst staff and students in higher education, particularly in relation to the effective use of learning data to promote student success. The Daltaí objectives were to:

- Review and identify the continuous professional development (CPD) needs of higher education staff with regard to learning analytics skills;
- Develop a sample of open access professional development resources that scaffold and enable staff and students to interpret learning analytics outputs.

Methodology: The needs analysis for CPD in learning analytics conducted in this study used a mixedmethods approach, combining collection and analysis of qualitative and quantitative data. Five student and five staff focus groups were carried out, capturing the voices of 37 students and 40 staff members. The aim of the focus groups was to identify preferences and needs in relation to up-skilling and training that may be required to engage with learning analytics. Student participants represented undergraduate and postgraduate students from Business, Marketing, Computing, Creative Digital Media, and Science. Participating staff came from a range of departments and functions including Business, Computing, Creative Digital Media, Science, ICT, Communications, Careers, Library, Quality Assurance, Disability Services, Counselling and also Educational Developers (via EDIN). For the second phase of data collection, surveys were developed to collect the opinion of a larger sample of stakeholders on points raised during the focus groups. There was a separate survey for staff (190 participants) and students (1390 participants).

Findings: There was a strong interest in, and an expectation of, greater adoption of learning analytics, meriting a focus on training as an enabler of learning analytics adoption. There was a strong consensus on the top priority for training from both focus groups and survey analysis, namely training on ethics and privacy to ensure data analysis and resulting actions are GDPR compliant and transparent. Related to this, training on appropriate uses of data was also considered a priority. The second key priority was training on how to act on information inferred from data. Both students and staff prioritized staff agency in terms of knowing how to act on data to improve teaching practice. Staff responses highlighted a lack of confidence in their ability to act on data, emphasizing a need for training in this area. The third priority emphasized by staff and student responses is understanding the outputs of learning analytics. Both student and staff focus groups highlight the importance of feedback, student focus groups specifically prioritized feedback on overall progress. The surveys concurred, and prioritized feedback on overall progress over specific feedback on academic and professional skills development. However, both were considered important. There was less interest in training on how to analyse data. A theme in focus groups of feeling overwhelmed by data merits consideration in a CPD plan, to ensure a focus on how data usage

can seamlessly fit into existing activities, rather than become an additional job or source of stress. There was also less interest in training related to policy, with the exception of professional development staff for whom it was a key priority.

The resulting CPD framework, detailed in Part V of this report, presents three levels of training. Level 1, knowing, focuses on ethics and privacy, risks and limitations of data, appropriate uses of data for different stakeholders, and the role of learning analytics policy. Level 2, using and practicing focuses on data interpretation, data access, data quality, and using data for feedback. Level 3, taking action, focuses on action and reflection. The framework differentiates between the training requirements of different stakeholder groups, namely students, academic staff and professional services staff.

Implementation of such a framework would need to consider concerns expressed by staff over increased workload, and a requirement for short training resources backed up with ongoing support from a learning analytics function. Indeed, CPD alone will be insufficient to enable more effective use of learning data. Staff also require ongoing support in multiple related areas including the technical skills needed to process data, the interpretive skills needed to make sense of data within a wider, nuanced context, and enacting appropriate interventions to enhance student support. There is a balance to be struck between what can reasonably be expected of all staff in terms of data literacy and what additional support should be provided.



Introduction

Context/rationale

The field of learning analytics (LA) has come under increasing focus in higher education, in particular for its potential role in informing and supporting student success initiatives. While the potential value of learning data is now well recognised, tapping into this potential requires staff and students in higher education to be proficient in data literacy. The professional development requirements of staff and students in this regard have received little attention to date. The National Forum's Review of Existing Higher Education Policy Landscape for Digital Teaching and Learning in Ireland states that one of the areas of particular significance for policy development within digital teaching and learning is students' digital footprint (Murphy, T., 2018, p2).

Recognising the deficit of work in the area of professional development for learning analytics, the Daltai project aimed to develop a roadmap for continuous professional development relevant to teaching and learning in a digital world that supports engagement with meaningful insights into the quality of student engagement arising from student success initiatives. This will ultimately support the student in self-regulating their own learning, and support student-facing staff develop and evaluate evidence-based student success initiatives.

The project focused on how to increase digital proficiencies amongst staff and students, particularly in relation to the effective use of learning data to promote student success initiatives. This required an analysis of professional development needs with regard to learning analytics skills for higher education staff and students. Analysis results informed the development of a framework for continuous professional development in learning analytics for staff and students. The framework was then aligned with open access to professional development resources that scaffold and enable staff and students to engage with learning analytics.

This report details the methodology and results of analysis of specific professional development requirements that address the skills gaps of higher education students and staff who teach or lead teaching and learning enhancement. Specifically, it reports on both qualitative and quantitative research into students and staff perspectives on how Higher Education in Ireland should use student data, and what training and support is required to do this. The results were aligned with international best practice and expert opinion.

Aims and objectives

The overall aim of the Daltaí project was to increase digital proficiencies amongst staff and students, to enable them to effectively access, interpret and utilise learning data with the ultimate goal of promoting student success. On an individual level, this project focused on how to upskill staff and students to increase their awareness of, and their ability to make greater use of, their own digital footprint. In the broader

institutional context, it was envisaged that this could potentially facilitate the more widespread adoption of evidence-based decisions that support student success initiatives.

Specifically, the Daltaí objectives were to

- (a) review and identify the professional development needs of higher education staff with regard to learning analytics skills; and
- (b) develop open-access professional development resources that scaffold and enable staff and students to interpret learning analytics outputs.

To realise our first objective, we carried out a mixed-methods evaluative study using semi-structured focus groups and online survey tools data to gain an insight into staff and students' perspectives, knowledge, skills, and needs related to learning analytics. Using this data, we proposed to develop an evidence-based strategy and implementation plan which will address the identified skills gaps and professional development requirements of higher education staff and students in this area.

This report presents the findings of our mixed-methods study and discusses the significance of these findings when considered within the wider literature. Informed by these findings, this report also presents our evidence-based strategy and implementation plan for supporting the upskilling and professional development of higher education staff and students in relation to the use and interpretation of learning data.

Recognising the key work of the National Forum in supporting the professional development of those who teach across the higher education sector, Daltaí closely aligns with all five domains in the Professional Development Framework (Donnelly & Maguire, 2018).

Report Parts

This report consists of five main parts. Part I describes the methodology used, with a detailed overview of each phase (quantitative and qualitative) and the rationale underpinning this study. This includes data collection methods, approaches to data analysis and the procedure to verify concordance and reliability necessary in the context of a qualitative method.

Part II presents the main findings from focus groups undertaken with students and staff from across partner campuses. The main categories and subcategories resulting from qualitative analysis are presented in order to highlight stakeholder perspectives on Learning Analytics. This analysis includes examples of students and staff quotes that evidence the analysis.

In part III, a triangulation of the main concordances and differences in staff and students' perspectives related to Learning Analytics is presented. This second level of analysis provided a synthesis that better informs the training needs this project aimed to define.

Results from staff and student surveys are presented in part IV, evidencing that many perspectives expressed in focus groups resonated with a larger audience, although some differences in priorities are also highlighted.

Results from the four parts above are synthesised into a proposed training framework in Part V covering the main students' and staff's training needs. It provides a structured proposal to develop core foundation skills and particular training for Professional Development. This proposal endeavored to build on competencies developed through The National Forum Courses and Resources.

Part I: Methodology

A mixed-methods approach was used combining collection and analysis of qualitative and quantitative data. The first phase of data collection consisted of semi-structured focus group interviews with staff and students across all partner campuses, including the three main campuses of TU Dublin - City Campus, Blanchardstown and Tallaght - and Galway-Mayo Institute of Technology. The aim of these focus groups was to establish rich qualitative insights into staff and student's perceptions and awareness of learning analytics and related issues and to enable the identification of preferences and needs in relation to any upskilling and training that may be required among both cohorts.

In the second phase of data collection, surveys were administered that incorporated points raised during focus groups to enrich the results of qualitative analysis. There was a separate survey for staff and students. The purpose of this second phase was to increase the level of concordance and reliability gained in the qualitative phase. Stronger conclusions could be drawn combining the results of both phases.

Both focus groups templates and surveys were adapted from the SHEILA (Supporting Higher Education to Integrate Learning Analytics) framework protocols¹ which were validated by experts in the field.

Qualitative data: Focus groups

Five student and five staff focus groups were held between April and June, 2019, capturing the voices of 37 students and 40 staff members. One staff focus group was run at each campus, and a fifth focus group was run with members of the Educational Developers in Ireland Network (EDIN). One student focus group was also run at each campus, with the exception of the Blanchardstowncampus of TU Dublin where timetable conflicts necessitated two focus groups. Each focus group consisted of between 4 and 12 participants. This followed common practice in implementing qualitative focus groups to maximize the opportunity for all participants to share their thoughts and perspectives (Carlsen & Glenton, 2011). Consent to participate was obtained by focus group facilitators in advance, for which a Participant Information Sheet was provided. Focus group templates are included in Appendix I, adapted from the SHEILA framework. The only change to the SHEILA project template was the addition of topics related to training needs. These are listed in Table 1.

Student participants were recruited on a voluntary basis via the Student Union's class representatives and via Course Coordinators. Participants were selected on the basis that they were over 18 years of age, had a "Registered" status within their institution, and represented a range of disciplines and years of study including undergraduate and postgraduate students. Disciplines included Business, Marketing, Computing, Creative Digital Media, and Science.

¹ SHEILA project framework and data collection instruments: <u>https://sheilaproject.eu/sheila-framework/</u>

Staff were recruited on a voluntary basis via email. Each site focused on a different academic discipline to ensure a range of disciplines were represented. Cognisant that Professional Services staff would also be an important group whose opinions and thoughts are key to informing the development of any support or training around Learning Analytics, colleagues from a range of Professional Services were also invited to participate. Thus participating staff came from a wide range of departments and functions including Business, Computing, Creative Digital Media, Science, ICT, Communications, Careers, Library, Quality Assurance, Disability Services and Counselling. Following an invitation from the Educational Developers in Ireland Network (EDIN) to speak about the project, a focus group was also conducted with their members given the relevance of Educational Developers to this initiative. This information has been analysed as a third group but for triangulation purposes, the results have been added to the staff results to compile one staff's perspective to be compared with the students' perspective.

Protocol	Theme	Questions	Prompts
Student focus group	Training	Should the university provide you with training on data literacy?	Should you get training on how to interpret visual data from a dashboard? Should you get training on data protection an ethical uses of your personal data? Would you like training on GDPR covering Consent and Ownership and Autonomy Should you get training on interpreting statistics or other numeric measurements derived from your personal data? Should you get training on the limitations of learning analytics?
Staff focus group	taff ocus Training roup Student data?		How to interpret visual data from a dashboard? Data protection an ethical uses of combining data from different sources, analysis of the data, and the labelling of students (e.g. at risk) as a results of data analytics? Uses of data and the questions it can answer Interpreting statistics or other numeric measurements derived from students' data? Limitations of learning analytics, and dangers of inferring a label from a digital footprint Combining your own data sources and doing some analysis.

Table 1. Prompts added to SHEILA protocols for staff and student focus groups.

Quantitative data: Online surveys

Building on the data collected during the focus group phase of data collection, two anonymous online surveys were disseminated across the Irish HE sector, one to staff and one to students. These surveys aimed to complement the focus groups by gathering data on staff and student perspectives from a wider sample. By using a mixed-methods approach in this way, it was also intended that the validity of the data would be strengthened. Like the focus group protocols, the surveys were also adapted from the <u>SHEILA</u> surveys for staff and students, with additional questions added that addressed the key themes that emerged from focus group discussions.

Both surveys were hosted via Google Forms and are included in Appendix II. Consent to participate was sought via an opening question within each survey, along with a participant information sheet at the start of the form.

There were 1,390 responses to the student survey spanning 9 institutions, and 190 responses to the staff survey spanning 6 institutions. Responses to both surveys were predominantly from project partner institutions.

Approach to qualitative data analysis

Focus group recordings were transcribed using rev.com transcription services, and verified by the focus group facilitator and participants. The full transcript for each focus group was used. Each idea was considered one unit (Davey et al., 2010), resulting in 676 units in total. One contribution may map to more than one unit. After this decision, percentages of units of analysis were: 18.33% for Blanchardstown, 38.26% for City Campus, 26.65% for Tallaght Campus, and 16.74% for GMIT (100%). Thematic coding rounds utilized an inductive (bottom-up) process Braun & Clarke's (2006). A categorization structure evolved from similar themes within the transcripts. The first round labeled units with corresponding categories. A second-level of analysis (second round) re-structured this initial tree code; small labels were submerging into related subcategories. That resulted in a two level structure of categories and subcategories. A third round specifically focused on training and professional development requirements. The category Training, covered training needs, requirements, gaps in knowledge, interests, and concerns.

Codification of focus group transcripts was done by two researchers working independently, using NVivo. One researcher worked on staff transcripts and one on student transcripts. A sample of 246 units, sampled across all transcripts, was reviewed by the third researcher. This sample size ensured a 95% confidence level and a 5% confidence interval, as illustrated in Table 2. Based on Cohen's Kappa (κ), the level of agreement was moderate in both cases (κ = 0.431 for staff transcripts; κ = 0.427 for student transcripts), as illustrated in Table 3 and 4. Acknowledging a lack of consensus on cutoffs for intercoder reliability for semi-structured focus groups, we considered this moderate result sufficient to continue with the next phase of confirming stakeholder perspectives via a survey.

Campus			
Archive 1 Blanchardstown 1	37	5.473372781	13.46449704
Archive 2 Blanchardstown 2	91	13.46153846	33.11538462
Archive 3 City Campus	210	31.06508876	76.42011834
Archive 4 Tallaght	240	35.50295858	87.33727811
Archive 6 GMIT 1	63	9.319526627	22.9260355
Archive 7 GMIT 2	35	5.177514793	12.73668639
	676	100	246
Sample	676		
Reliability	95%	246	
error range	5%		
	246	100	

Table 2: Criteria to get a Students balanced sample



Table 3: Kappa Results for Staff

Table 4: Kappa Results for Students

Approach to quantitative data analysis

Student survey

The student survey had 14 questions in total. There was one demographic question covering which college the student was studying at. Nine questions were included from SHEILA's Student Expectations of Learning Analytics Questionnaire (SELAQ). SELAQ covered four themes: Ethical and Privacy Expectations, Agency Expectations, Intervention Expectations, and Meaningfulness Expectations. These themes mapped to a two-factor structure, Ethical and Privacy Expectations, and Service Feature Expectations (Whitelock-Wainwright et al., 2020). Expectations were assessed via two 7-point Likert scales, ideal expectations ("Ideally, I would like this to happen") and predicted expectations ("I expect this to happen in reality"). The original survey had 11 statements. However, as it was developed prior to adoption of GDPR legislation, two of the statements were replaced by two additional survey questions assessing students' knowledge of their rights under GDPR for this study.

In addition to SELAQ statements, two questions were included on training, one on ethics and one on using a learning analytics service. These followed the same format as the SHEILA statements above in terms of ideal and predicted expectations. Finally, students were asked to rate seven potential uses of their data, informed by focus groups discussions. Each was ranked using a 4 point Likert scale with labels 'very important', 'quite important', 'not important but nice to have', and 'not important at all'.

Staff survey

The staff survey was based on SHEILA's Teaching Staff Expectations of Learning Analytics Questionnaire (TSELAQ) designed to capture staff's ideal and predicted expectations of learning analytics. It included three demographic questions on gender, higher education institute (HEI), role within their HEI, and fifteen of the sixteen statements on learning analytics expectations, six of which were also on the student questionnaire. These statements set a context for subsequent questions on uses of data and training.

Staff were asked to rank 15 potential uses of data using a 4 point Likert scale with labels 'very important', 'quite important', 'not important but nice to have', and 'not important at all'. An additional question asked how a learning analytics service should be implemented. Staff were also asked to rank 13 training topics, informed by focus group discussions and categorised according to Wise & Jung's (2019) model of instructors' process of learning analytics. There was also a question on preferred modes of training delivery. A final question assessed staff's level of engagement in learning analytics to date via seven statements with a binary "yes" / "no" answer.

Data analysis methods

Analysis of both surveys used descriptive statistics including frequencies and percentages, and Spearman's rank-order correlations (r_s) appropriate for ordinal attributes. However, low variance in responses may mean correlations are overestimated. The final section in part IV compares survey results with focus group results to inform priorities for training topics.

Part II: Focus group analysis

The results of the focus groups analysis is covered across three sections. Firstly, results of staff focus groups are discussed which includes academic and professional services staff from project partners sites. Secondly, the perspectives of Professional Development staff from the EDIN network are discussed. Thirdly, analysis of the student focus groups are discussed. Themes are discussed in order of frequency of occurrence (f).

Exploring staff perspectives on learning analytics

Academic & Professional Services Staff

This section highlights the key findings of focus groups carried out with staff (including academic and professional services) across partner campuses. Five main themes or categories emerged as illustrated in Chart 1. These included perspectives on Learning Analytic applications (f=158), the usefulness of different types of data (f=158), and training and development needs (f=137). Staff also mentioned some concerns (f=107) and challenges (f=61) related to the implementation of Learning Analytics (LA) in their Institutions .



Figure 1: Staff's Perspective main categories

Theme: Potential uses for learning analytics in higher education (F=158)

This thematic category explores staff perspectives on how learning analytics could be used within their own professional contexts. Twelve subthemes emerged within this category, presented here in the descendant order of frequency of mentions (f).

Sub-category: Improving course design and delivery (f=27)

The most important application of learning analytics identified by staff was improving course design and delivery. Interestingly, a two-level interpretation was evident throughout the focus groups with staff discussing how they might use the insights derived from learning analytics to (a) potentially enhance students' engagement and (b) to help staff reflect on their own performance.

"Am I wasting my time? So, coming from a perspective of ``is there wasted resources, spending time trying to develop something that... rather than just dump the PowerPoint slides."

" I didn't realize, I thought it was about student learning analytics but it ended up as actually about programs and lecturers and modules so, I'm looking at that, plus I'm looking at continuous improvement for myself, how do you teach better. So, I'm more interested in how analytics help my course design...."

In general, the main reflection concentrated on associating planned activities with students' engagement to inform pedagogical decisions based on LA. The following comment highlights an interesting, related dilemma:

"If you design the module with the thought in mind in advance that you wanted to collect the data, but it curtails the way that you approach your module design then, or program design, because you're not just thinking what's the best way to teach this. You're also thinking about how I can also collect data that's relevant while I'm teaching?"

Sub-category: Learning Analytics and Learner engagement (f=21)

The next sub-category is related to learners' engagement (f=21). The first thing pointed out by staff was the importance of correct interpretation of data collected, especially if it comes from the Virtual Learning Environment (VLE). They highlighted that VLE-based metrics could be misinterpreted if other forms of engagement are ignored.

"It tells you exactly what it says, the last time they've logged in. If you put resources up on Moodle, one student might download it the first time he accesses it and never go near Moodle again and you think they're disengaged but they're accessing that material on a regular basis. Or you could have somebody that every time they want to view the resource they open it and might not do anything with it."

In general, staff were really interested in using learning analytics to help them to understand how much students are engaged with their learning.

"Learning activities, and seeing what their level of engagement is with each of the activities. I'd like to see that, I'd like to see how, you know, time and effort for me, does it pay off in the end?"

"There's such a wealth of data that can be used for feeding in. One, to check if you're delivering a module if you look at data early on, you can see whether people are actually engaging at the material"

The other useful characteristic is access to timely or "real-time" metrics to assess the level of student engagement:

"You don't know whether they're alive or dead or whether they're at the other end of the screen. So analytics as in real time is really what you need for that sort of programme. Do you need, see these engagement things? You need that in front of you all the time to know whether they're there."

"Now, this is particularly on our program, students are in communities and the access service will be using more detailed stuff. For them, it's about supporting higher-support students, and it's about identifying where they are not engaging, where they are not, you know, fall through the cracks, and then intervening with those supports."

Reflections about students' engagement linked to comments on the importance of a needs-based teaching approach and how the lack of it could provoke students' disengagement.

"I don't know those individuals, so if there's some way they can identify themselves to me, by virtue of a catalyst for learning that we give them. Then we can hit their needs. I think the needs-based approach is actually critical here, where it is, we use data, then they can self-identify an issue that they may not have thought was prevalent that's causing them to disengage for whatever reason"

Sub-category: Learning Analytics to highlight resources for students: (f=17)

This subcategory refers to the use of learning analytics to better understand how resources are used, and also recommend resources to students that address an identified learning need.

"Definitely to see how they're engaging. For me, if I'm going to the trouble of making a video that takes me three or four hours to make, how many people are actually looking at that video? Am I wasting my time?-"

"But also you can use it to see if there's areas where there may be difficulties that groups of students are encountering, or different groups of students encounter different difficulties."

Sub-category: Learning Analytics to indicate students' needs: (f=16)

Continuing with the strand of needs, the next subcategory is the application of Learning Analytics to indicate specific student's needs (f=16). ASD spectrum, mental health or welfare issues and disabilities were mentioned by staff and the possibility of tailoring activities or resources in each case.

"I suppose then, what you've been saying is the students are consulted on who that information is shared with in regard to professional support services, and then they can opt in or take things out, so it's essentially they're data. Unless, of course, it's a student that might be at risk, I suppose, if either failing or if there's a mental health issue or whatever, a welfare issue there"

"(...) we might have a lot of students and a number of students who are on the ASD spectrum and we lack resources and training to properly support those students. They're consistently not succeeding because they lack support. So, there is a potential for a tool like this to highlight specific resources that are needed for programs."

Although, sometimes the issue isn't lack of data, it's the lack of a follow up intervention:

"Sometimes the problem is that you can have lots of information, but it's the intervention and, you know, if you've no interventions, if there's no follow up on it, you have a problem."

It is important to highlight the meaning of this point in the context of this research: the decision process and actions arising from Learning Analytics must be clearly defined. Data without decisions or actions are not sustainable or useful.

Sub-category: Learning Analytics as a retention aid (f=15)

Students' progression, especially those in first year, was considered an important application of LA. Some reflections questioned if data could inform updates to institute policies to improve student outcomes.

"...looked at progression and retention ..., and they were able to see a really clear gap between those that received financial support and those who hadn't. So here's a policy we need to lobby for, advocate for more support for those students."

"Whereas if you can go, look, the people that implemented it had an X percent increase in engagement and retention. You know, can we use it in a rich way to test our own policies and then improve them if they're not working?

Progression was also connected with issues such as competition across programmes, although with less frequency.

"But there are serious issues to be addressed there. If you have some programmes, which is the case, progression is 85 percent and others where progression is 52 percent or 47 percent, it's vitally important information."

"it's not just data, it's got to say, here's your competition and you've almost got to beat this. Or if we're going to get funding next year, etcetera."

Retention has also received a lot of attention in the learning analytics research community, although as with student needs, follow up interventions remain a challenge (Wong & Li, 2020).

Sub-category: to shows differences between groups (f=15)

Staff recognised that every class and tutorial group is different, and both their academic standards, and how to address their needs, can vary. Academic staff discussed if Learning Analytics could help them identify and understand group differences, and so inform their teaching approach.

"Now, maybe you could change it as the time went on, you could pick up quicker, but we do have sometimes weaker classes and stronger classes and that kind of academic information"

"There are cohorts that are very different. You don't know what to expect."

"Yeah, no, we split them into groups and then we set them different codes so they log on as group 1, group 2, group 3, group 4. So they all automatically are in groups in Moodle but then you can actually, it would be nice if you can actually see the statistics of one group versus another."

In addition, Learning Analytics could help identify problems that individual groups are facing.

"But also you can use it to see if there's areas where there may be difficulties that groups of students are encountering, or different groups of students encounter different difficulties."

Sub-category: LA to provide evidence for policy and teaching strategy (f=15)

Staff considered that Learning Analytics could be applied to provide evidence about different institutional projects, policies and general teaching strategies, for example within a school. In this sense, they showed interest in getting some "measures" that give them enough information to verify the institutional impact through policies and projects.

"I think we all acknowledge the value of policies and strategies being informed by the facts. So that it is evidence based, so it's useful in that regard"

"I suppose, just thinking about data and what you do with it ... It's not specific here, but for example, it's so useful for policy stuff. For example, there was a piece of research done by our Access colleagues, who looked at students who were getting financial support and students who weren't getting financial support."

"There's got to be really useful stuff that we're doing here, and then how do we build policies, structures around them?

Do we buy more e-books? Do we invest in print?"

Sub-category: LA to trigger interventions (f=11)

Intervention was discussed from two perspectives. One was using Learning Analytics to intervene in their own teaching, making teaching decisions based on evidence (data). From this perspective, LA would be teaching-centred to intervene in their own performance.

"Here's no point in looking at this unless we have appropriate intervention mechanisms to actually act on it.

I'm guessing the main objective of the interventions are at the module lecturer level."

The second was student centred interventions, and the kind of information that is useful to support interventions to the learning process when students are struggling or disengaging.

"So, for example if a student was having difficulty that then that might trigger, say, contact with the NLN or student counsellor, or whatever services might be useful to actually help the student engage in a better way."

Other applications for Learning Analytics also appeared through the focus groups, some related to the themes discussed so far. Their frequency was not significant enough to analyse in detail, but worth mentioning nonetheless: to show pass rates and trends (historical data f=9); to assist staff in time management (f=7); to highlight resources for programmes (f=4); and to detect gaps in courses design (f=1).

Theme: Types of data are useful (F= 158)

On the topic of useful data, staff recognise different types of data (f=99), the importance of availability and relevant data (f=20), usefulness of educational historical data (f=11), data to trigger a human conversation (f=10) and other types (f=18). The first of these had a significant concentration of references throughout the focus groups.

Sub-category: Different types of data (f=99)

There was a wide variety of perspectives on the kind of data that is relevant. On student activity, the most mentioned were submissions, attendance, progression, retention and engagement.

"I think what, I don't know, for me anyway is, submission dates and frequency. So, if they get all in on time, that means I think they're really interested in that lab or that particular assignment, you know, if it's in good time."

"I think students should know what their attendance is. I don't see why they can't be notified, you have attended 5% of the course, and it's four weeks in, or something.

"And we would have retention issues at the end of first year and I would suspect that there could be a number of cases where that's directly linked to the fact that it is AQA and there's insufficient supports being put in place for students so that is certainly something that I think could be useful in terms of data collection.

"I would do the same. I would use (XXX) to track where the students were engaging and then the next bit is I then send a group email to those who don't engage. Gives you that facility, doing that. It's not great because it might only show the last use, it could be five minutes ago. But it might show the students that haven't engaged in 20 or 40 minutes"

Discussions on progression considered how to address students' weaknesses or vulnerabilities:

"I suppose we've noted one other thing, like for example, we don't have a specific research and writing methods module in CDM and we notice that maybe the writing skills... are a problem throughout certain modules but we, and we started to try and do it ourselves by, I sent out a document asking to populate, "What do you do in your module?" And can we kind of look at how this is a stream across the four years and you know in what modules then could we address specific needs but like a learning analytic tool would be useful for something like that."

"To find vulnerable students' conditions" "To support students with learning disabilities"

"Visibility. That's where it might actually see more things being thrown up in terms of the problems that appear in certain weeks that actually there's a lot more going on in a particular week than what it appears on the surface."

Access to comparisons across modules and programmes was also considered useful.

"To follow exam boards. Rankings and multi-ranks to understand where my module is, continuous assessment (CA)".

"Types of rankings such as Individual (teachers and students) , programme data, college data and institutional data"

"To find patterns like activity-student engagement or learning styles" or "their career preparedness or career readiness"

Sub-category: Importance of availability and relevant data (f=20)

Three different strands were found in this subcategory. The first is access to relevant data "on time" within a programme, for example getting a full view a students' academic progress across modules:

"And it's terrible when you think about it, I would get down to prelim exam board to see where we are with every other module. So that's my feedback... So if we knew where all the students were the whole way along and I think it's partly where the marking is, I think it's really important to get the year before and the year after. So, you have some gauge, particularly if you've only got the module for the first time or the second time."

Secondly, getting information at a programme level:

"At a program level, yes. There are huge discrepancies across the board, when you look at marks. And if we had the averages of the modules.

"Whereas electronically would give us the comparisons, the averages, for each module, side-byside."

And lastly, better access to data across departments and functions:

"I think one of the first things to be brought up was who was able to access the data. I think that's key, because I think often, like the disability service may have certain types of data that we think is specialized for our needs in order to help our students. But this could be really vital data for everybody else. I was saying the library. A lot of this we may not look at, but I've had conversations with you about things like students' difficulties in referencing and that kind of stuff. Your data would show us what are interventions, what is being done, what's of value to the student, and do they know about it? I think it's cross-pollination."

Sub-category: Usefulness of educational history data (f=11)

In this aspect staff have different opinions. Some thought historical data on a student would be useful, others thought it may be interesting but not useful, while some believed it could negatively impact on students by introducing bias based on previous academic performance.

"Like, I would be looking at it from the perspective of that borderline student, or that student who's late with submissions so that if there's a pattern. Were they like this first year, second year, third year, fourth year."

"...to put educational history, I think it's of academic interest but really, I don't know how you could use it in any kind of a practical way."

"I would not be in favor of historical data. Number one is the subject has to stand on its own. Somebody could do well in xxx's subjects and poor in mine. They could do well in my subject last year and poor in this year. But the second thing is you tie yourself down with data. When you've big numbers, you can't look back. How did they do in first year, how did they do in CAO? Really you deal with the subject and it stands on its own."

Summarising this sub-category, for staff the utility of educational history data for academic purposes is unclear.

Sub-category: Data triggering a human conversation (f=10)

Mentoring is of particular note in this subcategory, and how Learning Analytics could trigger a dialog with students. Other instances were timely feedback and face to face contact with students during their course.

"But the most useful is the individualization, because then you can actually talk to the person.

Even if you're doing well in the course, you might have other issues that you might want to discuss, or even the fact that somebody cares enough.

Finally, other issues are mentioned included pass rate trends-historical data (f=9), student behavioral data (f=5), and mature student engagement (f=4), but their frequencies are the lowest in the context of the whole theme.

Theme: Training and Development needs (F=137)

In this theme, staff perspectives are based on two specific sub-categories: the kind of training, and topics they consider necessary to learn about Learning Analytics.

Sub-category: Training areas and topics (f=99)

Significantly mentioned topics relate to: GDPR, ethical issues, and anonymity (f= 54); general statements about training (feedback, module design, and teachers' performance) (f= 37); and how to manage feeling overwhelmed about data (f= 8).

On GDPR, ethical issues, and anonymity, staff thoughts were focused on understanding clearly the usefulness and the limits of what can be done within the law.

"I mean, we all did that training that was online and I thought that was like a kick in the teeth, almost."

"But the flip side is true as well, which is that we might say it would be ideal if we had all of this, and the reality of GDPR means that it's not available to us."

A critical point emerged when staff mentioned that two things must be balanced: on the one hand, GDPR requires that teachers just kept the minimal information needed, but on the other hand, teachers want to know the historical process of their teaching to learn and enhance it, so an important point for training is where the baseline of "minimum" is.

"One of the principles of GDPR is that you only gather as minimal amount of data as you need. You don't gather lots of data on the basis that I might need it at some point or it might potentially be useful. So, that's running through my head the whole way is that, how do we set a baseline for what is the minimum amount of data that we do need, as opposed to let's just take a whole pile and see what we get."

"Prior to GDPR, there's a policy here that Moodle only has one archive. In olden times, I would have easily looked back at a fourth year in my class to see how they were in first year or second year. But that's gone now. I would have been able to see how they... But that's something that was very, very relevant, to look at their history." Another relevant point discussed through the focus groups is time-availability, and the significance of higher education institutes being publicly-funded organizations.

"But if in 50 years' time, if somebody wants to find out if I worked here and what I did, actually that data doesn't exist because of GDPR. Is this something we should actually be worried about in terms of our record-keeping and digital data."

"We're a publicly-funded organization. We have a duty to keep some sort of record of who attended and when."

Finally, the limits about student anonymity is, under staff's perspective, significantly difficult to determine and more clarity is needed on who can have access to sensitive information, and if students must know about it.

"There's also the issue of qualitative things, like case studies. They're vital, because I've seen situations where we've been involved with students, whether it's for funding or legal reasons or whatever, that we keep a record of the qualitative interactions with students. That's very, very difficult to have a policy on how exactly I want this. A lot of it is very, very sensitive, and very, very personal data.

"I think what it comes down to as well is, my major concern would be around the sensitivity, so sensitive information, who has access to that, do they need access, should there be student consent, and the student ... You mentioned there, the student owns that information, so they can decide who they bring it to."

"Certain departments get a list of students that are registered with disability service and the library. One of them, because we ... They get extra loan lends. The way it works, they just bring a letter and they have to disclose their disability. Well, they don't disclose, they just say they're registered, but it's very difficult. We're working with the disability services to have a more streamlined process there, and we can explain or whatever."

In the case of general statements for training, the staff are interested in learning analytics for feedback and course design but are concerned about the impact on workload and how it will be resourced. Do they have to "produce" their own data and to learn how to analyse it, or will data analytics be provided allowing them to focus on the appropriate pedagogical response.

"This is where I think the college doesn't facilitate this. The college wants feedback, but they won't give the resources to support it. The only way to support this is having appropriate class sizes, and appropriate tutorials. And you can't have both"

"Is there a case to be made that if there was upskilling needed, that it's about the interpretation of table and data, rather than the generation? Because I have a bit of a concern about role expansion. I'm not entirely sure that it's my job to become a data generator and analyst on top of everything else that I do. So, is it somebody's role within the Institute to generate that? I'm happy to be told how to read it but I think we all have other things to be doing."

This position was followed by a feeling of being overwhelmed about data, not only how to get it but how to use it in a timely manner.

Sub-category: Training types (f=38)

This subcategory encompasses a wide variety of expectations mentioned by staff. They said training relating to teaching innovations would be useful, but also emphasized training should be short, and provided along with ongoing support in both data interpretation and acting on data in innovative ways.

How to follow their teaching innovations:

"I use Google, Slack, WordPress, all these things. How am I meant to use Kahoot you know. The reason we have all these tools is we're trying to be innovative with what we do."

The modality of training:

"If there's training for this and it was two hours and it got to the meat of it, that's all I need. Somebody else who wanted to do, spend a whole afternoon, just different people need different levels. But I think forcing everybody through the same training programme is a mistake.

I'm not sure about, I tend to do data analytics, so I wouldn't need training, but I think maybe more than three hours of training once a year for the staff. Have ongoing discussions where people can come in, ask questions, and discuss stuff, let's say twice a term."

Who can give them some support:

"I think that having real time information can be useful. I definitely think people, that would need to be just like we have XXX support, there would need to be support there for people to know how to use it."

And the last one, about data interpretation:

"So what do you do with data? On its own, it's kind of meaningless. So it's the meaning we bring to it and the interpretation."

Theme: Concerns (F=107)

Even if the staff's perspective about Learning Analytics tends to reflect a positive position, they had concerns that institutions and academics should be aware of. It's worth noting that topics of concern were very similar to the topics that training should focus on.

The main concerns are based on ethical issues and GDPR:

"It's that the system is going to have to be designed in some way to reap data or ignore data, and just the basic GDPR principle of a minimal amount of data.

I mean, if we could just get the basics, the basic data right. And is there a problem surrounding, for example, if we see the points that they had when they came in, are there GDPR issues about"

The second with management, the workload, the overwhelming feeling and the need to share data in the different areas of the institution when supporting students is necessary.

"Yeah. I suppose one of the issues that we have trouble with is that we're reliant on academics to share the information, and not all of them will do that. There's better engagement."

"The culture needs to change. We need to change the culture around information systems"

And the third was awareness of bias and misinterpreting data:

"I think maybe there's also issues with potential bias. If you're looking at the student in isolation compared with all of the other modules without necessarily intending to do so that you might think, "oh, this student just isn't engaging full stop"

"That's really what students find challenging, academically challenging, and what someone finds academically challenging, they won't particularly do well in it and so they, it's a natural response to blame teaching practice. Whereas you can teach the same methods in some other subject that actually is an easier subject to teach, it's not difficult, and you get different feedback. So you have to take things very carefully."

Theme: Challenges to implementing LA (F=61)

Two main issues arose in this theme. The first one is linked to infrastructure and best tools for Learning Analytics, and the other was, again, Ethical considerations as an area that challenges all institutions.

I was felt the infrastructure was not there to collate all relevant data:

"The only practical problem that I can see there is, because I'm thinking of another situation, but we still don't have an infrastructure that allows us first to collect the data in a way that communicates with other data, and in order to do proper analysis." "There is no across the board system, where we can put this data in and then run reverse."

Tools for Learning Analytics were also discussed, both with respect to data in a specific virtual learning environment (XXX), and collating data into a management information system:

"I think there could be a tool that a course board could decide, okay let's look at, could we use this and then be able to populate it with information to see where it falls across a course.

"But XXX definitely not very intuitive as far as a dashboard

"XXX has lovely visualizations of the data and it's students and staff who have access to, certainly students can see it across modules and staff depending on how the rights are set up can look at visualizations across modules. It has the potential to do so really nice"

"I think it could be aware of a parallel process with the management information systems, where they've been trying to ask, say heads of department, what sort of information do they want or need or use? Because that should inform the management information systems"

Professional Development

This section discusses the analysis results from the EDIN academic developers focus group. Participants representing a range of HEI's across Ireland, and discussed challenges, needs, and knowledge underpinning Learning Analytics. The frequency of five themes that emerged can be seen in the graph below. The two most dominant themes were around policy needs and the uses of Learning Analytics. The three other themes mentioned were training needs, GDPR, and Feedback.



Figure 2: Professional's Development Perspective main categories

Theme: The need for a Policy about Learning Analytics (f= 44)

The professional development group considered that a clear, precise, and accurate policy is necessary for learning analytics. While a policy needs to clearly and simply define what Learning Analytics is, and is not, for, developing a policy must also address the complexity inherent in defining an institutional purpose for LA.

"And I think it's important then for us and for academic staff to also have a sense of maybe understanding that side of things as well. Because sometimes we see life through our own discipline, and that could, potentially from a training perspective, is something that's worth considering, in understanding what we mean by learning analytics and where does it stop and where does the qualitative then come in to explore, and where does another approach come in"

"But then the double-edge sword for us is, if we can try and do this well, then we're modeling best practice for academics to be using on their students as well within the VLE. So, it's all that kind of complexity part as well" The group also discussed the importance of considering the full, diverse student body, and not just focus on first-year students.

"I think also, and the reason I'm thinking of this is because the cohorts that we work in are slightly different, in that my students are all academics. They're all academics in a fully online program. So, when we're talking about data analytics, I'm thinking of them as the students in my program. And when you said about first-year, or someone mentioned first-year students and their needs being particularly different to say second, third or fourth-year students."

Theme: Uses of Learning Analytics (f=43)

In this group, the most important uses of Learning Analytics were related to identifying issues and actions to improve Teaching and Learning, and the importance of balancing data with conversations. Another use emerged as a tool to enhance universities' services for example libraries, study spaces, etc.

"But they have a really nice step model that they've introduced, Insights, Understanding Actions, Analytics and new insights. So, essentially they're building it as an action-research project, and exactly what we're saying, that we're saying it's evidence-based but we're feeding it back, and how we're bringing this into the teaching and learning piece. So, I can share this."

"But that's in the moment, in the context of the learning of that program. And we lose that rich demonstration of how well a program is working, because it's the connecting of the learning from the program to practice that comes through those reflections. And I think that that's sometimes without having been able to bring that story in, you're left with a non-balance in relation to what's really happening. And it goes back to all of our previous conversations."

A third objective discussed was related to uses focused on students such as to detect their needs, and to raise alerts when they are needed. This is the only situation where people explicitly mentioned the use of Learning Analytics as a predictor of success and performance, both in Blended Learning and all students in general.

"Well, we currently use it. Our initial question that we were talking earlier on about the whole area of pre-implementation of analytics but the information meaning, question gathering area, was a small one but very important, it was exactly that, student support early on in semester one"

"I think we came to learning analytics purely by accident because we, when I came along, started to gather data and compile data under the project. We just started to notice trends are like, well, this person hasn't logged on in in a while, and their contribution to the mandatory discussions, it was only 500 words, and then you start to add up data points and that equals this person is going to be problematic at the end of the course"

Theme: Training needs (f=23)

A significant perspective in this group was that training be done in the context of a pedagogical perspective rather than a technical one, and they emphasised addressing mis- or pre- conceptions that only can be surpassed with training.

"And just a general comment, I think from what everyone is saying, it does strike me that analytics is a problematic phrase. It really is raising all sorts of, sometimes, negative preconceptions."

"Where do we start to bring those conversations and challenges from the pedagogical perspective into that? And then how do we translate that? Because that would be a very useful thing to have when you're going into programs for instance, and talking about the use of analytics, and bringing that [pedagogical perspective]"

As a consequence of these needs about training, this group suggested opening the discussion on Learning Analytics across their college to capture the variety of contexts:

"I think we all thought that, because it's just so nuanced and it is so context-sensitive, that I think it has to start with some sort of dialogue about what it is, what it's going to mean in different places, what's important. I don't quite know what form that should take, but that, I think, has to be a starting point at least."

And a last point related to training was related to the dangers around bias and mis-interpreting data, and that people using Learning Analytics need be aware of this:

"We've had conversations with librarians, and there's certainly big concerns among the librarians in relation to tracking students withdrawal patterns, their borrowing records. So, for example, if you've been borrowing books on Karl Marx, does that mean you're of a communist disposition"

Theme: Learning Analytics and GDPR (f= 22)

Group discussions captured some of the uncertainty around GDPR and ethical issues, especially on appropriate uses of data, and the necessity to specify what kind of data can be collected, and what data can be used for learning analytics. They differentiated between data captured for another purpose, and data captured specifically for an LA project. For example:

"But it's two different things. It's that, are you capturing that data anyway? And then, where does the ethics fit in? Is it before you asked the question about, I don't know, just take for example library attendance. Before you say, "I'm going to capture library attendance." That's what we're actually trying to figure out. Is that where your ethics application comes in? Do you need oversight from ethics there? Or is it when somebody takes that data and creates a project and starts? Is it every individual project needs ethical oversight then, once you start to drill in and ask different questions of the data?"

Theme: Learning Analytics and Feedback (f=19)

The last theme from this group is about Feedback. Their perspective about Learning Analytics indicates a close relationship with student engagement and the potential for far-reaching opportunities:

"One of the most fascinating things was understanding the differences between colleges and their perceptions of us. Like so, lecturer X has had a very strong engagement, but medicine and health... Or lecturer X didn't have a very strong engagement, they're actually worse, but medicine and health were the strongest. When you think of those in terms of disciplines, there's a lot of similarities there, but why was one so engaged and the other one wasn't? And then going out and getting data"

Finally, Learning Analytics favors timely Feedback linked with assessment. This group also considers one of the benefits of Learning Analytics is the possibility to start to develop different models of evaluation, harmoniously balancing qualitative and quantitative data.

"We have used this year, now only as a starting point, we used some of the feedback from the ISSE survey to introduce our approach to assessment and feedback in terms of course design. So, X had provided us with some of the stats around feedback and assessment and we were saying them to the people on the program, and started thinking about what students are saying about the assessment and their interaction."

"But I think it's really important to know then where to leave the data set, and start to then take an evaluation approach and use what we already use as recognized models of evaluation to explore something that's been identified. And not just overly rely on a quantitative approach, but remembering then that the discipline of teaching and learning and education falls within a different approach, and a qualitative sphere"

Exploring student perspectives on learning analytics

This section presents the key findings of focus groups carried out with students across all partner campuses.

Overall, the analysis of student focus groups resulted in the identification of 899 codable units (Davey et al., 2010). Analysis of these units resulted in the identification of four main themes or categories: uses of learning analytics; attitudes towards monitoring of student data; student rights in relation to data; interest/concerns regarding university data collection practices.



Figure 3. Students' Perspective main categories

As indicated in figure 3 by far the most dominant theme emerging from the student focus groups concerns "potential uses of learning analytics" (f=628 frequencies). Exploration of this area provides an insight into students' opinions and perspectives on how their college can make the best use of learning analytics.

The second theme emerging from the focus groups (albeit occurring much less frequently) relates to student attitudes towards monitoring of their data. For the most part, students are unconcerned about how their college monitors their data (f=X); however, they expressed a clear desire that such monitoring is subject to their explicit and formal consent (f=202 frequencies).

The final two themes that emerged from the students' perspective (albeit with substantially less frequency) concerned students' awareness (or lack) of their rights in relation to their data (f=42) and students' lack of interest or concern about how their college collects and utilises their data (f=27).

Within each of these four overarching themes, categories have been identified which explain in detail students' thoughts and perspectives related to Learning Analytics. The sections that follow will explore these categories in more detail.

Theme: Uses of Learning Analytics (F=628)

This theme contains nine sub-themes as illustrated in Chart 4.


Figure 4: Uses of learning analytics: students' perspective

The most dominant theme by far, concerned students' desire to see learning analytics used as a feedback enabler - specifically to provide a clearer insight into their educational grades and progress (f=423).

Improving services and experiences is the next concordance amongst topics in this subcategory. This included ensuring students understand clearly what they can do with Learning Analytics (f=48), and aspects related to data accuracy (f=21) and consistency about data points in Learning Analytics (f=6) were mentioned for them. Also mentioned was using Learning Analytics to improve students' experience (f=44), Quality Teaching (f=35) and University's services (f=21).

Student reflections on learning analytics were not all positive, they also discussed concerns they have. The most frequent was using their data for other purposes beyond academic ones (f=22). They were also concerned about who could see their data and expressed clear objections to access by all staff (f=8).

The next part of this report considers each sub-category and offers some evidence for its analysis.

Sub-category: Using learning analytics to track students' progress (f=423)

Before this section starts, it is necessary to clarify that, when students referred to "grades" throughout the focus groups, they mix indistinctly: academic results, scores, grades and learning progress. It is understandable because they do not know the technical difference and they use a "generic" word to address different situations related to their progress. In each case, the report is going to show with evidence the context of each reference.

This sub-category is constituted by seven topics that are described in the graph underneath:



Figure 5: Following grades main topics

The most important topic emerging from student discussions relates to using learning analytics for feedback purposes (f=157). However, feedback covered a number of aspects, so it's useful to divide this topic into subtopics in order to understand the different aspects of feedback that students mentioned. Feedback is followed by identifying needs or failures as a positive use of Learning Analytics following students' progress (f=71). Though it has less than half the mentions compared to feedback.

For students, Learning Analytics can be used to increase the level of understanding about <u>students' needs</u>. They were able to point out different levels of those needs. For example, they mentioned situations related to special needs like dyslexia, learning disabilities, health, and psychological issues.

"Do you think the college using data like that could help you?

"I would say yes, especially with the previous education. Say for a student that has dyslexia or learning disability, the college could ..., they could know, we know you have this, we can offer you these services. Or you're a mature student, you can have these services."

On who should make initial contact with you:

"If it's to do with your lecturer's courses, or anything like that, then probably your coordinator. But, if it's to do with personal reasons, probably the school psychologist or something to do with that with your situation. Then probably another person to do that, to email you instead."

On another level of needs, students could identify those which are related to academic situations like struggling with a module/course or when they are not doing well in an academic sense.

"If he's not engaging with any of the classmates nobody will know. So, I'd say if the lecturer notices that something is wrong, I think they should at least ask the person if he's okay, if he's doing all right. Maybe that sort of interaction will help them a bit, and will maybe even tell them, give them a reason to, like, go and ask for help if needed."

"I think students that are registered with the access office, so they might need extra, not learning facilities or things like that. Just a little bit like were it harder to learn. And lecturers make that really obvious and they're going to put you down over being registered. It's a follow on with the student who may have a disability but, where some lecturers may not be sensitive to things like that and just accidentally say it maybe or merely don't realize that it's not appropriate to say in the class where there might be people seeing if you're okay and things like that."

They also mentioned needs related to personal issues:

"Or if I need to talk to the lecturer, or I need to sit down and talk to the lecturer about a personal issue, I need help in this module or I need to talk to my lecturer about needing help in this module. Then possibly personal reasons is another one."

To continue this strand of analysis, another good use of Learning Analytics related to following grades. Students would like to be able to track their own progress (f=31) and to minimize the risk of dropping out (f=20).

When students mentioned the uses of Learning Analytics as a possibility to track their own progress they are able to identify its potential in improving motivation and self-regulation. For example, setting their own personal goals and comparing how they did in the past, and how they are doing at the present.

"I would say because especially as a first year student, I don't know, I'm super new to everything so-knowing what I need to pass, just even a pass so I know at least I can kind of say, oh I'm passing. The [depending on the student] student can decide to aim to get higher above the average. It's kind of that peace of mind that I'm actually passing, that would relieve a lot of stress."

"...agree with what Student_G is saying, also I feel like if you could opt in, you should be able to opt out. But also, I think that it could be a good idea to even, when you opt in you only get all the data from that point on, so it's an idea of rather than seeing all your past ones, you get to see from that point onwards. So obviously it's collecting data all the time but even limiting someone from seeing what they previously did because, for example I may have done really bad last year, I don't really want to see all of that bad data, you know? I just want to see the good stuff."

About retention, they consider that Learning Analytics is a useful tool to avoid dropping out:

"I think like the dropping part is more to do like if the course gets them interested. Like, I'd say more than half of us dropped out in second year because it's probably that they just wanted to do ... to go down a different road than this course was leading them on. So, I'd say as well those three hour gaps did not help with our attendance at all because usually oh, three hours oh. And then like an hour lab, nobody wants that" "I think it's mostly just lack of attention on the course really. They must have the demographics to see like, one group usually gets the bad end of the stick when it comes to time tables. I think noticing that, look at the data on that and see if the drop outs correlate with that group in particular. That one group just drops down quickly."

They also acknowledged that following grades through Learning Analytics could have bad effects like <u>comparing grades</u> (average) or "labeling" students (bias) (f=58). Precisely related to comparing grades, students were concerned about the privacy of their grades and any circumstance that would <u>breach GDPR</u> (f=47).

"I think own data tracked because being compared to others can make people feel down and affect self-esteem, oh I'm not doing as good. Because it could be in a class of A-level students and they could be like an average just trying to pass, that could affect how you feel."

And about grades being shared publicly, they mentioned some experiences like:

"First student: that happened to me in semester one, where one or our lectures actually put up our results on a spreadsheet.

Second student: And like you can see how much you score and like you can see your friends scores

Third student: Yeah, you can see everyone in the class. You can see everything."

It is worth highlighting students' awareness of both the benefits and drawbacks related to the following grades as a use of Learning Analytics.

As it was set out above, <u>the Feedback topic</u> contains different sub-topics. The most relevant subtopic emerged on Feedback is when students mentioned the challenge of finding a useful format for receiving their Feedback (f=68), when (opportunity) (f=31), and how often (f=13). It is important to highlight that most students, but not all, preferred "human intervention" arising from Learning Analytics:

"Let's say if those two weeks are bad for you, I would rather have an email from a lecturer asking if you're okay. Kind of trying to help you out in that situation whatever it is. Rather than like an automated message saying, "You haven't logged in. Please log in again," or something like that. Kind of like you're having a bad week. I want them to initiate the conversation, so we kind of have a start at it. So you can try them like, "Okay, I've been having a bit of a bad week. So something like that."

And there is no agreement about the format. Some of them prefer "a voice" rather than a written message:

"It's better to do it by voice rather than text and in person, so I think maybe just have that in there in the email . Like email first, then if they don't get in contact then they don't get in contact, I'm not sure what else can be done... but make you invite them to a personal call because it can make all the difference rather than just constantly emailing back and forth." Whereas, others appraise that an automatic message would be better:

"I feel like it should be fully automated in terms of Moodle. For user engagement, and everything like that, it should be automated and sent where how well you're doing or expectations, that should be automated. Then the email itself should be automated, if it notices that your grade is going down below a certain point then you get an email automatically. The reason I'm saying it should be automated is because getting an email from my head lecturer is very daunting"

"Just to add to that, just adding on. With the automation I agree with Student_G there, sometimes when you get an email from a lecturer, or you email the lecturer yourself, you don't know what way it's being perceived. So if it was to be set up so that I get an email saying you're in trouble, you need to come for a meeting, or do you want to set up a meeting? That solves all that for you then you can go up and meet your lecturer then and there. Sometimes composing an email to your lecturer, it can come across to them very cynical or very sarcastic, whereas you're just trying to figure out what's going on. Then sometimes you get an email from them and you're like here look at this, what's going on? So definitely automation would be a lot more trouble-free."

Another point related to Feedback was to ensure that academic staff were appropriately trained in using Learning Analytics (f=19).

"Well, I mean, I'd hope that any lecturer that is gathering and analyzing data that they would have the technical skills to be able to perform you know, be actually doing the correct methods and be able to understand what they are looking at exactly. So we wouldn't want somebody going onto an excel sheet or using the power of AI and then not being able to understand the information that they are looking at. So just technical training, firstly, would be the most important."

Students also mentioned that if feedback suggested academic support would be beneficial, it must be optional (f=11) considering that they are able to make their own decisions about their progress or results.

"Yes. Absolutely. I don't think that students should be forced to get any sort of feedback from lecturers if they choose not to. I can't see any students wanting no feedback but in relation to direct contact for non-engagement, I think there should be an option. You don't, if I'm in the middle of doing one project and then this lecturer wants me to make a bit more progress on this project when I have it already planned, I don't want that at all."

"Other student: Yes, if you want to get feedback about anything, you have to go directly to lecturers. Directly.

Rubrics are mentioned as a tool to give feedback and be able to follow their grades (f=8) but sometimes they feel those are imprecise or not detailed enough to make good decisions. This highlights a good opportunity for colleges to work more closely with their academic staff to develop accurate rubrics to enhance students' learning experience.

" o just to clarify, the majority of the room has received rubrics but in some cases, it might be rare, like it might have been once out of 20 assignments or some people might be getting them regularly."

Other student: "but sometimes I feel like students when they are reading the marking rubric and it says you know to achieve a one or to achieve a high grade it says to show proficiency or across multiple areas versus showing good proficiency across multiple areas. It sometimes is not very detailed".

Finally, students also addressed inappropriate feedback (f=7) that is not sensitive or constructive. For example:

"Well in an inappropriate way of giving the news could be if there was a student that was gone for a period of weeks and when he did show up the lecturer made quite a big deal out of it. Say, ah Jaysus, I haven't seen you in ages in front of a class of 40 or 50. That would be one example. Yeah. And that person, I think everyone in the class does know has personal problems. You know what I mean? He wasn't just being lazy."

Having analyzed this sub-category of Feedback as part of the topic "Following Grades" it is clear that students have a good knowledge and well-based experience to link Learning Analytics and its uses (pros and cons) to improve learning experiences.

Sub-category: Ensuring that students understand how to access and use learning analytics (f=48)

Continuing with the analysis, the next sub-category of uses of Learning Analytics is related to their interest to understand their progress shown through a Dashboard tool. An example of this interest:

"I think that it would be really good for students to be able to read the data because it will sound for them even in an interview where they might have to do sans presentations in the future, and they not have any previous experience on it and that might just be the job that they landed into and they can present and be oh we had this in college or they can say it in an interview if they received the training"

Despite their interest, students have different understandings about training needs. On the one hand, some of them consider it essential to be able to understand the information shown but at the same time they consider training must be included in their modules:

"Facilitator: Should you get training on interpreting statistics or other numerical measurements just derived from your own learning data?

Student: Like absolutely. Because especially in science, like we do an awful lot of Stats modules and stuff like that. And it's very important not just for yourself but as one of your core modules or as your core component in your course. So absolutely then. There's no point in showing people statistics or graphs or figures or trends if they don't understand them. So it should definitely be, but then again as we said it can be included in the other modules at the beginning. Absolutely worth doing."

On the other hand, some of them mentioned their training could be interesting but not important. If they had to learn Learning Analytics it should be embedded within coursework, rather than additional training, except if it were optional:

"I don't think it would be 100% vital, but it would be interesting, and it could be useful in some situations, but again with integrating it into an actual course would be better than something that pops up in the college. Like in Orientation in first year. If you're given an introduction on how to analyze these things, figure these things out. But I agree that I don't think it would be hugely important, but it would be interesting."

It is interesting to reflect on students' thoughts. The content of this sub-category shows something pertinent to point out: they consider it relevant to understand their data but at the same time, this understanding must be part, or embedded, in their discipline's knowledge, not as something apart. The reason to highlight this point is that this distinction reflects in a clear manner students' perceptions about LA: completely functional and useful but always in the context of their disciplines.

Sub-category: Improving the individual students' experience and engagement in higher education (f=44)

Throughout the focus groups, thoughts emerged on students feeling more engaged, if they could see their progress and make some decisions to improve themselves. For example:

"if you were given anonymous, obviously, the data for everybody within your class and see, correlate between yourself, their average attendance and their average results. You could see that look, I just need to step up here, this is the problem right here, I can push myself a little bit more, do a little bit more of this, log in a little bit more. Be a bit quicker while I was logged in, etc. and maybe that would give somebody the ability to then push up their results. Of course, that could lead to leader boards and that can sometimes be negative on the lower end of your class. So if you're not doing that well but you're trying to push it up but it's really impossible for you to do at this stage, you might just give up."

Alternatively, how colleges could use students' data to make decisions, which enrich their learning experience, based on their social and background characteristics:

"yeah I completely agree with Student 7 because first year and second year, that would be a good push of the information onto like a bit of everything, that's like very generalized. So if you could put similar minded people into different class groups based on their background, you could possibly then get a greater outcome for them. So let's say there are people for instance who come from the city that have an extremely tech background. If you could put them into a class and get them the learning experience that best suits them, that will give them the best tools that will help them. Versus the people that maybe haven't had enough computer or whatever engagement that you could give them even extra or at least the ability to go and get extra help with something that would be very beneficial to them. Instead of them always being backwards and never being able to get up the ladder towards the point that the other people have."

Or enrich their learning experience on their individual styles and manners to process information:

"I think coming from the fact that everybody's generally coming from secondary schools where you're using learning from certain techniques sitting down for eight hours a day studying theory and then coming to a university like if information could be used to help show students that there might be different techniques used to learn and the information was used in that way I think that would be a much more effective way. Rather than say segregating groups of people or something like that. But yeah I think that would be most effective. Coming to college and then you know being into a classroom and your default is to sit down in a classroom again and just put your head in the books. If there were ways of showing that there are other methods to learn I think that would be a good use."

Overall, students consider that Learning Analytics is useful to enrich their learning experience promoting students' engagement on a very personal level, making individual decisions due to be able to see and reflect about those things they have done or not, during their courses.

About the idea of using Learning Analytics to enhance students' experience, they mentioned that if their teachers are able to follow, what kind of resources and activities students do or not, data could highlight what kind of content needs more attention or requires a teachers' decisions to be made.

Sub-category: Improving the quality of teaching (f=35)

References to teaching activities emerged throughout the focus group also. Students consider that Learning Analytics is useful to analyze communications between teachers and students. Related to these interactions, students thought another use could be by coordinators to follow teachers and evaluate their performance.

"(...) that course coordinator would be able to see a lecturer's interactions with students and see if they're actually being helpful, or if they're just doing the bare minimum themselves."

As part of the teaching decision process, students mentioned the utility of data facilitating awareness of different students' profiles and as a consequence, to adjust their teaching to those characteristics. As well as to change their materials or presentation methods if needed. The third use of teachers' decisions was about scheduling continuous assessment (CA) and projects.

"I completely agree with that. If lecturers, I think lecturers should be given all of the data in regards to each module that you are working with, being able to see where your CA's are coming up, what's coming up with this, with all their modules. And then being able to see well I can plunk a CA in here because they've got nothing for a week before or something like that if they are given that information, there's none of this, I'll put a CA this week, a CA next week, they're both worth 40 percent and then you're project will be the week after. If you could stagger that type of thing."

Students' opinions also alluded to data highlighting where teachers who do the same thing every year resulting in the same student performances. On the same reflection, students thought Learning Analytics should help teachers understand how to improve if they are not getting good results from their students.

"Like, "how do I change my way of teaching to help you?" They should be able to gauge by results and by how long is spent on the web courses and everything, how to then change their strategy?"

Sub-category: Improving college services (f=21)

Learning spaces was key theme in the "Improving university services" sub-category:

"(...) if they could use, coming up to exam times, if they could just be aware that more people are using the facility in Aungier Street to either get more desks, get more chairs, do something.

Another student: I kind of think though, the way you were saying, that if they use it to be like, "okay, they haven't been in this amount of time and we'll get in contact." I think it's kind of a duty of care, I think it's a good thing."

But providing extra services, and offering relevant information, are also mentioned as uses of Learning Analytics to improve campus services:

"I think the idea that again is that like you would take that information that would like that you could collect on stuff like that and then use it to provide extra services or extra time for people like that. I think that's kind of what this is trying to get at. And definitely, could help."

Some student concerns were mentioned in the students' progress theme above. Student concerns will be explored further in the following section under subthemes: objections about other uses of their data apart from academic purposes; all staff having access to their data; data accuracy; and data consistency.

Sub-category: Objections to other uses of learning analytics apart from academic purposes (f=22)

The most frequent concern that students mentioned was related to phones. Specifically, that the University could "ping" their phones and see their personal information or "chase them" if they were on campus but not in classes.

"I think it's your personal opinion whether you want to disclose that information. Also, if you're coming through the campus and your phone pings; let's say you've an issue with a lecture and you find it's easier for yourself, personally, to do the work by yourself and you're not going to that *lecture; they can then figure out you're still on campus and you're just avoiding it. They may not understand the full extent of why you're not going to that lecture."*

Although they agree to share their information with the college, the sharing must not cross personal boundaries.

"If I give my phone, and it's not used to call me and tell me I missed a lecture. Just only important situations only. I would let my phone be used."

"I agree with xxx and to be honest, I'd be fine with anyone in TU Dublin accessing the information on myself, like, whoever I choose to share the information with. But if it was to be extended outside the college I'd probably, maybe have a problem with that."

There were some concerns with current practices where students IDs were available on lookup to others via the email system.

"When we went to send the email, on the (xxx) page, when you typed in the particular page, and the student number was shown up. And I'm not comfortable with that. Anyone who can type in my name can see my number. And I think that's an issue. That's not supposed to be there."

And finally, sharing data outside the college was considered inappropriate use of their data even if wellintentioned:

"I'd be uncomfortable with information being used outside of the college or possibly being sold or used by another organization. But once it's being used inside the college for statistics, I wouldn't have a problem with it."

"I wouldn't find any concerns with the college, only if it's being sold outside the college because I personally can't stand the top, with data being collected. I hear it at school and everything I hear it, so I have no problem with it for college but if it's outside the college, I wouldn't be happy at all".

Or using their data for other purposes different from academic reasons:

"Like once again, what wouldn't be appropriate for use or for any other reasons like that such as, let's try to think of things like for example like doing illegal stuff such as selling it on or anything else like that. But like once again they get very, yes, it is very broad but you only have the data for one purpose. So using it for any other reason then that one per person would be very inappropriate."

<u>Sub-category: Objections related to staff ability to access students data (f=8) (Accessibility to all staff)</u>

In this case, students were clear their data must be managed carefully with restricted access based on staff and academic roles.

"If I'd rather in regards to xx (LMS), I'd rather my data be assigned anonymously to a random number generated, that only I know or only that the computer knows. Not that someone that set up the xx (LMS) system knows because they could have access to countless people's data and in the future hypothetically someone gets famous and then they release that data. It's just a bit scary."

"(...) you could restrict the data available to lecturers or even heads of departments."

Facilitator: So we should have role-specific data. Different roles get different data.

Student x: Yeah. If it was restricted to what they can access and not access, I'd have no concern."

In summary, students offered a good understanding of situations that could be harmful to them regarding inappropriate uses of their data, and provided some solutions to increase levels of security.

Sub-category: Ensuring the accuracy of data collected (f=21)

Based on their own experiences, students hinted at concerns regarding the accuracy of data. A variety of situations reflected this. Attendance, not using the LMS, student numbers, payment of fees, and using the library emerged as sources of poor quality data.

"There's never, there's no lecturer I think that takes perfect attendance."

"if they just pass round a sheet, and if there's so many people in a room, someone else can sign that person in."

"Or people who are on our list who aren't in our course anymore."

Related to the LMS:

"I think the lecturer you were talking about who didn't use web courses, we have this semester. And it isn't reflective, it's good to look at how many times we click in to it. If some lecturer doesn't have anything on web courses, it's not going to be reflective of me as a student."

And about using the library:

"Yeah, I don't object to anything, but again as I said, while all of this I'm fine with, I can't speak for it being accurate in any form. Like, just say take the library; some people prefer to study at home, so I don't think it's reflective of you as a student."

In all these cases students were surprisingly aware of the impact of accuracy in Learning Analytics and the consequences for them of poor quality data.

Sub-category: Ensuring consistency about learning analytics and students learning (f=4)

Distinguishing accuracy from consistency, students were clear in the difference and the need for both in Learning Analytics:

"Sorry, just back to the results, I don't mind for CA and stuff, those being presented online in the long list. Because I get that by email it is tedious. Like, lecturer X is just a great lecturer and that's so nice of her to send us all individual ones, but I think the main thing is consistency. Because if this data is to be used, like you guys said, to view their stuff on xx (LMS), for us it was only one this year. If it is to be used, it's not at all accurate, because not all of it is up."

Even if the number of frequencies is not high, it is significant that students can understand the difference between these two concepts in relation to Learning Analytics. They are able to realize the impact of both concepts in their learning progress data, and the impact lack of quality data remains unsolved.

Theme: Attitudes towards monitoring of student data (F= 202)

The second theme of importance is students' attitudes about collecting their data, not only by their college, but also by the internet more generally which they feel is a "lost battle":

"I just assume that if I start engaging with something, that they then instantly have access to everything to do with me. That's kind of my approach because they'll all have some sort of a pop up like, "Are you fine with this?" Just clicking yes will get rid of the notification, so then I just mentally assume that everything I engage with knows everything about me"

"I don't like it myself, originally I had been rejecting all of those, but it's just so much, it's kind of a losing battle. Some sites will just make it as hard as possible to opt out. Where like it's sort of dropdowns upon dropdowns, open for a second and turn the page or tab to opt out, and go to our affiliated website to opt out there as well. So I've given up and just accept everything now."

At the same time, they know colleges and national education related agencies (e.g. CAO) collect their data. They believe national agencies share relevant data with colleges:

"Yeah. I see all the information is already provided on CAO applications."

"I'd imagine so because CAO and everything like that but at the same time it's just data I guess, so it doesn't really bother me."

Along with the above is the knowledge or assumption that they are being monitored, and they know that this monitoring is collected data.

"Facilitator: Right. Do you use the college wifi much or would you tend to use 4G on your phones?

Student_G: I would tend to use 4G on my phone more but so I have used college wifi. Usually if I use my laptop it'll be connected to college wifi.

Student_H: I use college wifi mostly every day.

Facilitator_2: Okay. Would you imagine that being recorded or ...?

Student_H: I mean I guess I'll be recorded that I am accessing it, that's the only data I 'm assuming would be gathered from that."

Another evidence:

" I didn't realize that they'd track all that. But yeah, I suppose when I think about it, it's to be expected."

In contrast, they pointed out they were not informed clearly and explicitly about their consent and they really want to: a) do it formally; b) to know what kind of data is collected and c) to have this information accessible and visible:

"I suppose it should be quite common knowledge at this date that your data will be used, but I don't remember ever getting anything just being like, "just to let you know, we have access to all this and we can use it if we want to."

"Not quite. Coming from a computing perspective, I would assume that my data is being tracked and I assume that they have these things it's never made explicitly clear. I find."

"I think it's very important though that you make sure that at the start of every year that everyone has consented. That, if something like that does happen, that after a certain amount of days, be it thirty days or something where they haven't been active on Blackboard or anything, or they haven't been seen in College at all, that there is consent that a lecturer can be notified and contact you."

"Facilitator: If guidance was available, what way would you expect that to be presented in accessible? What would you do, how would you like it?

Student 4: In a footer of the website or something like that. So all students can access it and it clearly lays out what's been done."

Again, they raised the issue that colleges must look after their data, and expressed many concerns related to who can access and download their information without any control of it:

"I would have a massive problem with certain people within the college including lecturers having access to the data. Especially those that wouldn't be used to dealing with data. Because God knows what they'll do. They'll pull it from our file, and they'll put it on a USB, they'll lose the USB. It's guaranteed, it happens in every organization. If you give every single lecturer that hasn't had any knowledge of using excel before getting this, oh this is great, download, download, I've downloaded hundreds of students information, I put it in a USB, I fired it off and somebody else picks it up on another laptop."

"I would like to know how you protect my data. How it would protect your customers."

"(...) then the college has to look after our data the same way."

Even if students know they are monitored and accept it with a certain level of assumption or understanding, at the same time they want to be asked formally for consent, and informed about what kind of data is collected, what is done with it and how their data is governed.

Theme: Students' rights in relation to data (F=42)

In general, students were unaware of their rights with respect to their data, with some exceptions from students in technological disciplines:

"I'm actually not aware of any rights regarding the data collection from either third party, first party or whatever sort of...

"I actually haven't, that's the first time I've heard this term." [term is GDPR]

Facilitator: Do you understand your rights under GDPR, Student_B?

Student_B: No."

Related to the period of time their data can be kept by their college:

"Facilitator: Okay. How long do you think the data should be kept for if you've given consent?

Student: I don't know. Maybe until you're finished, until you graduate? Like, a year after you graduate?

Student2 : I think to be honest, when we graduate or the day we finish college, that should be the end of them holding our records, to be quite honest."

On making decisions about their data, students mentioned they would like to choose the kind of data that is kept for their own interest and to have full control on their data:

"I think there should be stuff like that, or say if I went to counseling; if I want the counseling to be notified that I've gone to counseling for this amount of time, I think I should be able to consent, or have the ability to take that information away if I believe I don't need that on my profile anymore."

"You should, especially with GDPR and everything, and especially if you're trying to give in a CV somewhere, they're not allowed to take it. Because you could come back and say, "well actually I

don't want you having that information." I think you should have full control over who gets to see what."

Even though students accepted almost knowing nothing about their rights over their data, they were not interested in learning more about it unless it was part of their courses. As it is possible to see, many questions and a significant lack of knowledge emerged in this area but students never asked to be taught about their rights.

Theme: Interests/concerns regarding university data collection practices (F=27)

Consistent with the lack of mentions about an interest in knowing their rights, students expressed a few times that they do not feel any concern about what kind of data is collected by their college (f=27):

"I suppose it was never something that I really thought about."

"As we talk in the group, we never say, oh, I wonder if, the teachers know how many times I downloaded the same file or if I look at the Moodle or if I ever entered a library.

"We don't talk about those things. And there is no, I didn't see any interest. Oh, if someone is monitoring that resource or us."

Adding more references about students' positions on this topic, they think that even if they get details about data collection, they probably would not read the information given. Furthermore, they thought the majority of students would not read it.

"I don't think it's so much so as what Students would want that information is but how do they actually see it? Because I think if you get, if you send out just a big long, if you send out a general email with a big long attachment, realistically half of them aren't going to read it, like over half them aren't reading it."

Part III: Focus group triangulation

Having analyzed staff and students' perspectives, this part of the report is the triangulation of staff and student perspectives to enrich the analysis and knowledge about their thoughts and needs, and recognizing divergences and convergences between them. Staff and professional development focus groups are fused into one perspective: staff, and contrasted with students. A high-level view of the themes for both groups is provided in Chart 6.

The specific name of each theme or subcategory was considered in the context of comparing their meaning across the two groups. For example, specific subcategories related to GDPR were fused into

one, namely "GDPR and implications", to enable consideration of students' and staff's perspective about the same theme over the specific content analyzed in part II.

This level of analysis aims to highlight the most relevant issues related to training which will underpin our proposal for professional development training in data enabled student success.



TREEMAP: MAIN THEMES STUDENTS AND STAFF

Figure 6: Main Staff and Students' categories contrasted

In this triangulation exercise, the four main convergences are discussed, along with divergences within each of these four themes.

The most frequent theme that emerged in both groups is "Uses of Learning Analytics". A strong convergence has been found concentrating more than half of all codification. Nevertheless, students were more emphatic about uses of LA than staff. While staff highlighted this theme, it was more balanced with other themes discussed.

Chart 7 illustrates the convergence of sub themes related to Uses of LA across both groups. It also highlights aspects that were different for each group.



Figure 7: Convergences between Staff and Students related to Uses of LA

The main points of concordance between students and staff were: to improve course design and delivery (teaching); to point out students' needs or strengths; as a tool of retention and to enhance university services.

Specific LA uses highlighted by staff but not students were typically relevant to staff facing analytics only. Of more interest was uses highlighted by students that staff mentioned infrequently or not at all. Specifically, tracking their own progress, and LA as a tool to give feedback. Specific aspects that emerged for students on feedback included LA as a useful means to receive feedback, as well as the format, timing, and uses of rubrics. LA as a tool for Feedback was weakly mentioned by staff. While the issues raised by both groups could be characterised with a desire to use learning analytics for self-improvement, the points raised by students pose an interesting challenge for staff to consider LA from a students' perspective, and so use LA to enable success with a learner-centered focus.



Figure 8: Convergences between Staff and Students related Ethics and GDPR

Ethical issues and GDPR about Learning Analytics are the second convergence between both groups and are illustrated in Chart 8. Student groups mentioned circumstances related to ethical aspects more times than staff groups. While students may have shown less accuracy about the legal dimension, and a somewhat superficial idea about GDPR, they were clear and articulate on their rights. They want to know, and consent, to how their data is used, and have autonomy over their own date, for example asking for their data after finishing their university studies.

On the other hand, staff's attitude manifested as concerns over the boundaries related to LA, a lack of clarity around what kind of data can be collected, how accurate it is, and how it can be used. As the analysis in part II shows, staff consider it necessary to clearly understand GDPR and ethical implications about students data.

The third convergence found was concerns and risks about LA reflected in Chart 9. Both groups share some concerns to be aware of when they think about using Learning Analytics. First of all, the risk of being biased, utilizing data in a wrong way, or misinterpreting data causing subsequently some kind of bias.



Flgure 9: Convergences between Staff and Students related Concerns

Another important issue that emerged was linked to characteristics of the data itself such as accuracy, quality and accessibility. Both groups, in a balanced consideration, emphasised those aspects as concerns to be clarified when a Learning Analytics implementation will be put in place, as illustrated in Chart 9. The effect of inaccurate data will affect directly not only students' performance but also lecturers' decisions.

The last convergence found is related to training (see chart 10). Both groups consider training necessary for lecturers and staff to understand Learning Analytics and to be able to use it in the best way. Even if students would appreciate being taught to read and interpret their data they put more emphasis on training for their lecturers and staff.

Without any doubt, staff mentioned several times their need to be trained about Learning Analytics in its different aspects and dimensions. Their perspective is that Learning Analytics is something "complex" and requires lots of work and good definitions.



Figure 10: Convergences between Staff and Students related to Training needs.

After analysing these four instances of convergences between both groups, it is important to mention a relevant aspect that should be highlighted: the need of a policy, institutional definition and implications of LA that has been mentioned only by Professional Development staff. It is a theme not considered by the other two groups but clearly expressed by them.

The relevance of this aspect is based on the knowledge and good practices of other worldwide universities which have established their definition, code of practice, and policy as the first moment of training. That will allow our universities to build up our professional competencies about Learning Analytics having a clear understanding of our own definition (Scheffel et al., 2019; Sclater, 2016).

Part IV: Survey analysis

Following from focus group analysis, the next phase of the methodology aimed to capture the opinion of a wider audience both on learning analytics generally, and on themes that emerged from focus groups. As explained in Part I, two surveys were administered, one to students and one to staff. The following sections present descriptive statistics from each survey. The surveys themselves and accompanying information sheets are included in Appendix II. Both were implemented using Google forms. Only respondents that gave consent to using their data in reports and publications were considered. Staff responses were anonymous. Students had the option of providing an email address to be included in a draw, email addresses were deleted once the draw had taken place (May 2020).

Student survey analysis

Responses to the student survey were collected between February 18th and June 15th, 2020. Five amazon vouchers equivalent to £20 we offered as a prize draw. A small number of students responded more than once. Where responses from the same email address had the same scores in every attempt, one response was kept. Otherwise multiple responses from the same email address were deleted. This resulted in 1,390 individual responses in total. All were aged over 18 and agreed their data could be used within reports, articles and/or conference presentations.

Responses from TU Dublin students made up 62% (867) of all responses, 36% (504) of responses were from GMIT, 1% (8) were from other Irish Higher Education Institutes, and 1% (11) selected 'other'.

General attitude towards learning analytics

As stated in Part I, nine statements from the SELAQ survey were included to assess general attitude towards learning analytics (Whitelock-Wainwright et al., 2020). Two statements covered ethics and privacy and seven statements covered learning analytics as a service covering agency, intervention and meaningfulness expectations. Students rated each statement on a 7-point Likert scale, and under two headings, "Ideally, I would like this to happen" reflecting ideal expectations, and "I expect this to happen in reality" reflecting predicted expectations. Point 7 on the scale mapped to strongly agree and point 1 mapped to strongly disagree.

Responses overall were very positive, echoing focus groups discussions that students expect their college to engage in learning analytics. The average response for ideal expectations was 6.2 as illustrated in Table 4. Responses to predicted expectations were also positive (m= 5.1). The two statements on ethics and privacy received the highest ranking for both ideal and predicted expectations. The next two most popular statements related to teaching staff acting on the outputs of learning analytics. These were the only statements that specifically mentioned staff. The next most popular was two statements on students

having access to data about their progress (meaningfulness), echoing focus group mentions. The least popular statements related to intervention (updates on progress from college; and promote academic and professional skill development) and student agency (promote student decision making). So while focus groups expressed that information on progress was a key use of student data, it seems students prefer to choose when and how to access that data rather than have their college send it.

Statement	I expect this to happen in reality	Ideally, I would like this to happen	
My college will ensure that all my educational data will be kept securely.	5.8(6,52	
My college will request consent if my educational data is being used for a new purpose.	5.51	6,50	
The teaching staff will have an obligation to act (i.e., support me) if the analytics show that I am at-risk of failing, underperforming, or if I could improve my learning.	4.8	6.23	
The teaching staff will be competent in incorporating analytics into the feedback and support they provide to me.	4.60	6.12	
The learning analytics service will present me with a complete profile of my learning across every module (e.g., number of accesses to online material and attendance).	4.98	6.10	
The learning analytics service will show how my learning progress compares to my learning goals/the course objectives.	4.92	6.02	
My college will regularly update me about my learning progress based on the analysis of my educational data.	4.8	6.02	
The feedback from the learning analytics service will be used to promote academic and professional skill development (e.g., essay writing and referencing) for my future employability.	4.8	6.01	
The learning analytics service will be used to promote student decision making (e.g., encouraging you to adjust your set learning goals based upon the feedback provided to you and draw your own conclusions from the outputs received).	4.90	5.95	

Table 4. Average response to each of nine statements about learning analytics from the SHEILA student survey, ordered based on ideal expectations. Statements in red refer to ethics, statements in orange refer to staff acting on data.

Knowledge of rights with respect to student data

The majority of respondents were somewhat aware of the data collected about them (56%, n=776). However just over one quarter of respondents were not aware that their college collects data about them (27%, n=380). The remaining students were fully aware of (13%, 185), or knew how to find out (3.5%, 48), what the data collected about them.

Just one quarter of the respondents (345) knew their rights with respect to personal data held by their college, and an additional 6% (91) were not fully sure but knew how to find out. For the remaining students, 27% (368) did not know their rights, and a further 42% (585) were not sure of their rights. The correlation between students' knowledge of their rights and knowledge of what data is collected about them, was weak (r_s =0.18, p<0.001).

While responses reflect focus groups discussion, it is also worth recalling that in focus groups discussions, students were unconcerned about colleges using their data, and trusted it would be GDPR compliant.







Figure 11. GDPR: what data we have and what are your rights?

For what purposes would you like your college to use your data?

Students were asked to rate seven potential uses of their data. Three related to improving teaching quality including feedback, two related to helping students in difficulty, one related to general academic purposes (*improving a student's educational experience*), and one related to improving campus services. Each was ranked using a 4 point Likert scale with labels 'very important', 'quite important', 'not important but nice to have', and 'not important at all'. Students typically picked one of the first three labels. The highest response rate for the fourth label, "not important at all", was 4% as illustrated in Figure 2. Adding 'very important' to 'quite important' for each purpose illustrates a strong positive response from students to all seven uses of their data, ranging from 97% to 81%.

Students regarded improving teaching quality as the most important use of their data, concurring with their response SELAQ above. A total of 97% rated it as either very important (77%) or quite important (20%) as illustrated in Figure 2. This received relatively few mentions in focus groups. Also related to teaching, improving course design was the second most important use of student data; 95% ranked it as very important (72%) or quite important (23%). The third purpose related to teaching and agency, i.e. improving feedback, was considered less important . Just 54% selected very important and 34% selected quite important. Feedback was the most mentioned purpose during focus groups, although it encompassed various sub-topics including feedback on grades and feedback on students that are struggling.

Three purposes related to improving the experience of an individual student (a subtopic of feedback in focus groups). Identifying students that are struggling was considered the most important of these with 68% of students rating it as very important. A more general purpose of improving the educational experience for individual students got a similar response with 64% rating it as very important. Just 50% regarded identifying students who are disengaged as very important. However, the survey was administered late in the academic year, so disengaged students were likely to be unrepresented. The final item on improving campus services had the lowest score for 'very important' (44%).



Figure 12. Purposes for student data, ordered by score for "very important". Orange relates to improving teaching quality; green relates to helping individual students and blue relates to campus service more generally.

Training

Students were asked about training in the two areas that arose in focus groups: their rights with respect to data collection and analysis; and how to correctly interpret a dashboard depicting their own data. Questions used a 7 point Likert scale for both ideal and predicted expectations, following the style of the

SELAQ survey. Taking agreement as a response of 5 or higher, 86% agreed their college should provide training on their rights and 56% expected such training. Similarly, 83% agreed training should be provided on interpreting a dashboard and 53% expected this training. Responses are illustrated in Figure 3. It is worth recalling from focus groups that students thought training should be run as part of course work.







Staff survey analysis

The Daltaí staff survey was administered at two Daltaí events and subsequently advertised more generally. The events were the E-learning summer school (ELSS19, "Developing all learners: Big Data in Higher Education") in June 2019 (n=30); and a "Learning support, data, ethics and law" training event in Jan 2020 (n=8). Both were open to all HEI staff in Ireland. The survey was advertised more generally between April 23rd 2020 and June 26th 2020 (n=152), resulting in a total of 190 responses. Additional questions were added to the survey after ELSS19 to include points highlighted in focus groups w.r.t. uses of data and training needs. These questions have a max of 160 responses.

The majority of respondents were from TU Dublin (67%) and GMIT (24%). IT Sligo (7%) and NUI Maynooth also contributed. As illustrated in Table 5, there was good gender balance amongst respondents, 50% identified as male and 46% as female. Most respondents were academic or teaching staff (85%). Of those, 29% were assistant lecturers and 61% were lecturers. They came primarily from three disciplines, Engineering, Business, and Science, as illustrated in Table 6. Professional services (10%), ICT services (3%) and Library (3%) staff were also represented.

Table 5 Summary statistics for gender and role

Gender	n	%
Male	95	50%
Female	88	46%
Prefer not to say	7	4%

Role	n	%
Academic	140	74%
Academic (College-based)	21	11%
Other Professional Services & Support Staff	19	10%
ICT Services	5	3%
Libraries	5	3%

Table 6. Functions and departments represented

Student services n		Academic roles	n	Academic disciplines n	n	
Learning & Teaching	5	Lecturer	91	Engineering/ Built Environment / Horticulture	46	
Student services	5	Assistant Lecturer	43	Business	40	
Administration	3	Senior Lecturer	8	Sciences	34	
IT services	З	Head of Department/Assistant Head of School	4	Arts and Humanities	16	
Library	2	Head of School	1	Social Sciences	4	
QA	2	Director	1	Tourism	3	
		Other	1	Other	6	

General attitude to learning analytics

Fifteen of the sixteen statements from the SHEILA staff survey were included to assess general attitude towards learning analytics. Statements covered a range of aspects relating to a learning analytics service including training, agency, intervention and meaningfulness expectations, six of which were also on the student SELAQ questionnaire. Staff rated each statement on a 7-point Likert scale, and under two headings, "Ideally, I would like this to happen" reflecting ideal expectations, and "I expect this to happen in reality" reflecting predicted expectations. Point 7 on the scale mapped to strongly agree and point 1 mapped to strongly disagree.

Responses overall were very positive as illustrated in Table 7. The average response for ideal expectations was 5.7, a little lower than students' average ideal expectations of 6.1. Responses to predicted expectations were also positive (m= 4.6) but again lower than students predicted expectations (m=5.1).

The two most popular statements based on ideal expectations were being able to understand learning analytics outputs (m=6.4) and being confident in their accuracy (m=6.1). The highest predicted expectation was being able to access data on courses they are teaching (m=5.5). Ideally staff would also be able to incorporate learning analytics into feedback and support offered to students (m=6.0), but this received one of the lowest predicted expectations (m=3.8) indicating a lack of confidence on how to act on learning analytics insights. Interestingly, while students expressed concern during focus groups about staff competencies with respect to LA, students (m=4.6) were more confident than staff in their predicted expectation of staff competency.

A key difference between students and staff responses was on the obligation to act. Students would ideally like staff to have an obligation to act (m=6.2) but staff ranked this as one of their lowest ideal expectations (m=5.0). Using data to promote academic and professional skill development was one of the lower ranking items for both staff and students, although staff (expected m=4.1) were less optimistic than students (expected m=4.8) that data would be used in this way. Staff and students responses concurred on statements regarding student decision making (agency), and providing information on student progress (meaningfulness).

The lowest expectations were with respect to data access: accessing data about other concurrent modules their students are studying (m=4.9); and accessing data from previous relevant modules (m=5.2).

Statement	I expect this to happen in	reality	Ideally, I would like this to happer	ı
The feedback from the learning analytics service will				
be presented in a format that is both understandable				
and easy to read.		4.9	6.4	4
All data collected and presented to staff and students				
will be accurate (i.e. free from inaccuracies such as				
incorrect grades).		4.8	6.3	3
I will be able to access data about my students'				
progress in a course that I am teaching/tutoring.		5.5	6.2	1
Teaching staff will be competent in incorporating				
analytics into the feedback and support they provide to				
students.		3.8	6.0	כ
My institute will facilitate open discussions to share		. –		
experiences of learning analytics services.		4.7	5.9	Ð
My institute will provide staff with opportunities for				
professional development in using learning analytics				
for teaching and supporting students.		5.1	5.9	Ł
My institute will provide me with guidance on how to				
access learning analytics about students.		4.8	5.8	3
The learning analytics service will present students				
with a complete profile of their learning across every				
course (e.g. number of accesses to online material,				
		4.6	5.8	5
The learning analytics service will show how a				
student's learning progress compares to their learning		10		
The learning and this and is (maxiding students		4.0	5.8	5
The learning analytics service (providing students				
their own decisions based on the data they receive		ло	E 4	
The use of learning analytics will allow me to better		4.0	5.0	2
understand my students' learning performance		19	5-	7
The feedback from the learning analytics convice will		4.5		+
he used to promote students' digital academic and				
professional skill development for their future				
employability.		4.1	5.0	5
I will be able to access data from previous courses				-
(modules) that are related to my course, to get a				
historical perspective.		4.0	5.2	2
Teaching staff will have an obligation to act (i.e.				+
support students) if the analytics show that a student is				
at-risk of failing, underperforming, or that they could				
improve their learning.		4.1	5.0	b
I will be able to access data about other courses				t
(modules) my students are currently studying to get a				
programme level perspective.		3.6	4.9	Э

Table 7: Ideal expectations about Learning Analytics

For what purposes would you like your college to use student data?

Staff were asked to rate fifteen potential uses of student data. All seven purposes from the student survey were included, along with eight additional purposes, resulting in: six on improving teaching quality; three on helping students in difficulty; a further three on understanding the learning context; one related to improving campus services; and one each on informing policy and supporting student agency. Each was rated on a 4-point Likert scale with labels 'very important', 'quite important', 'not important but nice to have', and 'not important at all'. Taking a positive response as the sum of 'very useful' and 'somewhat useful' highlighted a very positive response overall, ranging from 95% to 67% across the 15 purposes. Mirroring student responses, there was a relatively low count for "not important at all" for each purpose, although it was marginally higher than the student response. Figure 4 shows the responses to each purpose, ordered based on scores for 'very important' and colour coded by category.

Purposes focused on students:

Staff gave the highest ranking to improving an individual student's learning experience. A total of 95% rated it as very important (75%) or quite important (20%). This response was correlated with the response to understanding student needs (r_s =0.64) which 64% of respondents regarded as very important. There was similar interest in identifying students who were struggling (very important = 63%) or disengaged (very important = 63%). Correlation between identifying struggling and disengaged students was very high (r_s =0.83), but identifying struggling students did not correlate as highly with understanding student needs in spite of similar scores (r_s =0.49). There was no difference in responses when comparing academic versus non-academic roles. However, 74% of females said identifying struggling struggling students was very important compared to 53% of males. Differences in responses by gender for understanding the learning experience were not as pronounced, 82% of females select very important compared to 70% of males.

Just over half of the respondents regarded the remaining two purposes related to information about students as very important, namely insights into learner engagement (very important = 56%) and triggering an intervention (very important = 51%). Responses to these two questions were moderately correlated (r_s =0.54) suggesting factors influencing each response varied. A reluctance to rely on data alone was apparent from focus group analysis, particularly for triggering a student intervention.

Using data to enable students track their own progress was also popular (91% positive) although only 57% regarded it as very important. It's worth recalling that student agency was the least popular statement on the SELAQ student questionnaire, although the average score was still 4.9 (out of 7).

Purposes focused on teaching:

Improving teaching quality was ranked the second most important purpose (91% positive) although only 67% of staff selected 'very important', compared to 77% of students. Interestingly, female staff had a similar response rate to students (very important = 78%). Responses to improving programme design were

correlated with improving teaching quality ($r_s=0.72$) but with a marginally lower score (very important = 61%).

The remaining four purposes related to teaching were not considered as important. Just under half of respondents considered using data to improve student feedback as very important (48%). The score was the same for using data to get feedback on a teaching initiative. Only 44% regarding using data to identify useful resources as important. The least important purposes was comparing this year's students with last year's (very important = 35%) even though this came up as a useful purpose in focus group discussions.

Purposes relating to policy and campus services

Interestingly, responses for improving campus services (80% positive, 40% very important) were very similar to student responses to the same purpose. This was also the only purpose that had insignificant correlations with all other purposes (p>0.001) except for understanding students needs (r_s =0.35). Just under half of respondents (49%) regarding using data to inform policy as very important (49%). This was a key theme in the academic developers focus group. However, survey results here reflected opinions from the other two focus group cohorts (staff and students) where it was not considered as important.



For what purposes would you like your college to use student data? Staff responses

Figure 14. How should student data be used? Orange relates to improving teaching quality, green relates to information about students and their context, purple relates to agency, grey relates to policy, and blue relates to campus services.

Training

Twelve statements on training explored the importance of training needs raised during staff focus group discussions. Statements were ordered to match Wise & Jung's (2019) model of instructors' process of analytics. Table 8 suggests a mapping of survey statements to this model and also to the four key competencies for Learning Analytics identified by the National Forum listed below.

1. Having a good understanding of the challenges and opportunities of including data in teaching practice

2. Having a familiarity of good practice, in line with current research

- 3. Using data as an effective resource for supporting teaching
- 4. Familiarity with the data available to teaching staff (eg VLE reports)

This informed the three levels of our proposed training template presented in Part V, and also, summarised in Table 8.

Table 8.	Training	statements,	staff survey

Would training in the following areas be useful to you?	Process of analytics, Wise & Jung 2019	National Forum Competency in LA	Daltaí training levels
What learning analytics means / is		1.Understanding	
What data can we use and what can we do with it?	1.Understanding Promote		
Understanding the limitations of data	areas of curiosity		Knowing
Ethical and moral considerations of analysing student data			
How to ensure analysis of data is GDPR compliant, and when is consent needed		2.Good practice	
Which policies are relevant and who is responsible			
How to identify questions that learning analytics can answer	Question generation	3.Supporting teaching	
Assessing the quality of data		2.Good practice	Using and practicing
How to anonymise or pseudo anonymise data, and when is that needed	Interpret Data		
How to create visualisations from my own data		3.Supporting teaching	
How to correctly interpret visualisations of data			

How to act on information from analysis of student data

Pedagogical response Making decisions

Figure 5 illustrates the responses to each statement, categorised by National Forum competencies and colour coded based on the stages identified by Wise & Jung (2019) (as listed in Table 8). Within each category, results are ordered based on their score for "very useful". Results evidence training needs across all competencies and stages, with a preference for understanding good practice in learning analytics, knowing what data can be used for, and using results to inform a response. The discussion below also references the seven general questions on data literacy and preparedness included in Table 10.

Overall, responses to all statements were very positive. Taking a positive response as the sum of 'very useful' and 'somewhat useful', the most popular statement was training on how to act on information from analysis of student data (87% positive). The least popular, which policies are relevant and who is responsible, had a 71% positive response.

Knowing (promoting curiosity)

Training on topics that promote curiosity (knowing) were the most popular. The two statements with the highest score for 'very useful' (n=88) related to ethics, namely 'How to ensure analysis of data is GDPR compliant, and when is consent needed' and 'Ethical and moral considerations of analysing student data'. This mirrors student responses to SELAQ statements above. Interestingly, in a later question 61% of respondents said they understood what they can legally and ethically do with student data. So while ethics was considered very important, it was also understood by over half of the respondents.

Also related to ethics, training on "What data can we use and what can we do with it?" was also considered very useful (n=86). In addition, 49% believed their 'college did not have the appropriate infrastructure to collect relevant data'. Other statements related to data familiarity and understanding were less popular. Understanding the limitations of data was considered very useful by 46% of respondents. Training in 'What learning analytics means / is' got a relatively low positive response (71%) considering the high support for learning analytics generally amongst respondents. This may suggest a bias in the sample towards those who already have some knowledge of learning analytics. Indeed, 72% said they were comfortable 'identifying questions about their teaching practice that data analysis can answer', and 93% believed 'it was possible to collect data about student learning that can inform teaching practices'.

Training on 'which policies are relevant and who is responsible' also got a relatively low response in spite of the role of policy in protecting staff and students from data misuse. In addition, only 43% believed their college had appropriate policies in place to cover analysis of student data, supporting concerns about lack of policy raised during the academic developer's focus group.

Using and practicing (question generation and interpretation)

The most popular training topic on interpreting learning analytics was 'how to correctly interpret visualisations'. The score for very useful was 85 (55%). Over half of respondents also supported training on how to assess data quality (n=80, 52%). The remaining two questions relating to creating visualisations and anonymising data were less popular, and got a similar response from staff that said they had, and had not, analysed their own data previously.

Making decision (pedagogical response)

Just one statement related to acting on data, and it received the 2nd highest response rate, with 82 respondents (56%) regarding it a s very useful. This concurred with the popularity of using data to improve teaching quality.

Delivery modes

Respondents were also asked to select from six possible training delivery modes. The most popular were asynchronous online resources (63%) and face to face workshops (56%). Accredited training was less popular as illustrated in Table 9, particularly professional development badges. Note, percentages are calculated based on 160 responses to these options, except for online webinars (n=152) which was added to the survey later. The mean number of options selected was 2.5.

How should LA be implemented

In spite of strong support for developing training resources in learning analytics, when asked how a learning analytics service should be implemented, less than half opted for each of two options related to training. Of the four options presented, 44% selected "as part of professional development training in good pedagogical practice" and only 30% selected "as professional development training to allow staff do their own data analysis", as illustrated in Table 11. The most popular option was "as a resourced function that can create customised (GDPR compliant) visualisations of data analysis for staff". Providing a tool with pre-defined rather than customised visualisations was less popular (44%). This concurs with concerns expressed during staff focus groups about additional workload associated with learning analytics. It is also worth noting that 65% of respondents said they had done some analysis on data collected from classroom activities. Of those who hadn't done analysis themselves, 47% selected "professional development training to allow staff do their own data analysis".

Three respondents expressed concerns about implementing an learning analytics function, stating concerns about the possible misuse of this data (n=1) or regarding it as a waste of time (n=2). However, 80% agreed with the statement that 'while all analysis of student data will lack the full context for each student, some analysis is useful'.





Training: Good Practice



Slightly useful 3%

0

20

40

60

Slightly useful 🛛 1%

Number of Respondents (n=154)

100

100

55%

80

Slightly useful 📒 5%

40

60

Number of Respondents (n=155)

Not useful 📒 4%



How to identify questions that learning analytics can answer

11%

20

Verv useful

Neutral

Slightly useful 3%

Not useful 6%

0

Somewhat useful

Training: Supporting Teaching How to act on information from data analysis



0

80 100

Very useful 31%

Somewhat useful Not useful 6% Neutral 6% Slightly useful 🛛 1% 0 20 40 60 80 100

40

Number of Respondents (n=147)

60

32%

How to create visualisations from my own data



20

Figure 15.Staff responses to training statements. Orange relates to promoting curiosity, blue relates to question generation, purple relates to interpreting data, and green relates to pedagogical response.

Options: (more than one could be selected)	Online repository of resources that I can access in my own time	Face to face workshops/ seminars	Online seminars (webinars) <i>n=152</i>	Accredited professional development course/ certificate	As a series of professional developmen t badges	As a MOOC (massive open online course)
Responses:	101 (63%)	89 (56%)	70 (46%)	70 (44%)	37 (23%)	27 (17%)

Table 9. How should training be delivered? (n=160)

Do you agree with the following? (Yes / No)	Yes
I believe it is possible to collect data about student learning that can inform teaching practices	93%
While all analysis of student data will lack the full context for each student, some analysis is useful	80%
I am comfortable identifying questions about my teaching practice that data analysis can answer	77%
I have done some analysis myself on data I collect from classroom activities	65%
I understand what I can legally and ethically do with student data	61%
I believe my college has the appropriate infrastructure to collect relevant data	51%
I believe my college has appropriate policies in place to cover analysis of student data	43%

Table 10. Statements on data literacy and preparedness

Options: (more than one could be selected)	As a resourced function that can create customised (GDPR compliant) visualisations or data analysis for staff	As part of professional development training in good pedagogical practice	As a tool with pre- defined analysis and visualisations of the data we are permitted to access	As professional development training to allow staff do their own data analysis	other
Responses:	107 (58%)	81 (44%)	78 (42%)	55 (30%)	1 (1%)

Table 11. How should a learning analytics service be implemented in your University / Institute? (n=190)

The next chapter summarizes these results along with focus group findings, to inform a training plan aimed at enabling greater adoption of learning analytics.
Part V: Identify core foundations for everybody and map to a training plan: Framework for CPD

This section of the report recaps on the training needs gathered during the project to explain the rationale underpinning the structure of the proposal, considering not only that the National Forum already has relevant resources and training about Learning Analytics but to enrich them with a different perspective and depth according to the results from the qualitative and quantitative phases of this project. Our findings are combined with the National Forum's key competencies for learning analytics.

Summary of training needs identified by students and staff

It's clear from focus groups and survey responses that there is a strong interest in, and an expectation of, greater adoption of learning analytics, meriting a focus on training as an enabler of learning analytics adoption.

There was a strong consensus on the top priority for training from both focus groups and survey analysis, namely training on ethics and privacy to ensure data analysis and resulting actions are GDPR compliant and transparent. Related to this, training on appropriate uses of data was also considered a priority. Training resources on GDPR and ethics would be equally relevant to students and staff.

The second key priority is training on how to act on information inferred from data. Both students and staff prioritised staff agency in terms of knowing how to act on data to improve teaching practice. Staff responses highlighted a lack of confidence being able to act on data, emphasising a need for training in this area. Student agency was also important, but less so. However, given the importance of agency in pedagogy, both generally, and more specifically its role in broadening access to education in disadvantaged communities (Clegg, 2011), this is also an important focus for training.

The third priority emphasised by staff and student responses is understanding the outputs of learning analytics (meaningfulness). Both student and staff focus groups highlight the importance of feedback, student focus groups specifically prioritised feedback on overall progress. The surveys concurred, and prioritised feedback on overall progress over specific feedback on academic and professional skills development. However both were considered important.

There was less interest in training on how to analyse data, which concurs both with the responses to how learning analytics services should be implemented, and concerns about workload. A corresponding theme in focus groups of feeling overwhelmed by data merits consideration in a training plan to ensure a focus on data use to help staff and students rather than becoming an additional source of stress. This concurs with research on distributed cognitive theory, i.e. the use of instrumentation must fit seamlessly into the activities of the individual (Molenaar & Knoop-van Campen, 2017).

There was also less interest in training related to policy, with the exception of professional development staff for whom it was a key priority. Given the importance policy in ensuring good practice in learning analytics that is student focused and GDPR compliant, we believe this topic also warrants inclusion in the training plan.

Training plan structure

Having analysed the training needs, the Daltai team faced the challenge to understand what of those needs were already attended through The National Forum resources, and how this project could enrich the training experience about Learning Analytics producing synergy between the Daltai Project and The National Forum. The National Forum defined four key competencies related to Learning Analytics that they considered essential for those who teach²:

- 1. Having a good understanding of the challenges and opportunities of including data in teaching practice
- 2. Having a familiarity of good practice, in line with current research
- 3. Using data as an effective resource for supporting teaching
- 4. Familiarity with the data available to teaching staff (eg VLE reports)

Our initial draft, based on student and staff perspectives and previous research, was structured into three levels and three target groups, as illustrated in Table 12.

	Staff	Lecturers	Students
Level 1: Knowing (what could I see?)			
Level 2: Using and practicing (how could I interpret LA?)			
Level 3: Taking action (how to act, according to my role?)			

Table 12: Structure of Daltai CPD framework proposed

Mixing both proposals, and adding training requirements as specified by study participants, gives the CPD framework in Table 13. Rows divide topics into three sections. The first is 'Knowing' about learning analytics and its possibilities and limitations. Its focus is promoting curiosity about the questions that learning analytics can answer while providing clarity on ethical constraints and good codes of practice, the importance of learning analytics policy, and the types of data available to each group. Secondly, 'Using and practicing' focuses on topics relevant to working with data. Topics include data access & capture, data processing & interpretation and learning analytics for feedback. An emphasis on sense making rather than processing reflects the reluctance by front line staff to embrace generating their own analytics. The third

² <u>https://www.teachingandlearning.ie/resource-search/?fwp_resource_theme=learning-analytics</u>

category focuses on 'taking action', covering action and impact, promoting agency, and considering how this can take place within current work practices and resource limitations.

The importance of context in the learning process means that learning resources addressing areas of this framework need to be developed in a manner that connects data to its context. Given the variety of both instructional and learner contexts to be considered, development of training resources is likely to be an iterative and evolving process. This development must address the challenge of providing bite sized resources that are meaningful and relevant across contexts, while addressing complex issues of ethics, legal constraints, and robust critiques of inferences derived from data. Further research is needed to assess the impact of the Framework and corresponding resources in developing personal, professional and institutional capacity in learning analytics. The next step for this project is to develop resources for evaluation by stakeholders. There were many topics raised by stakeholders and consequently included in the framework. However, the success of such a framework is dependent not only on the quality of the educational resources developed to enact it, but also on ongoing support for stakeholders. For example, staff reported feeling overwhelmed by data, and under equipped to derive actionable intelligence from it. Similarly, there were concerns expressed about data quality, and its impact on resulting models. On the other hand, there was a requirement for training to be short, and not to assume an expansion of responsibilities. CPD alone will be insufficient to enable more effective use of learning data. Staff also require ongoing support in multiple related areas including the technical skills needed to process data, the interpretive skills needed to make sense of data within a wider, nuanced context, and enacting appropriate interventions to enhance student support. There is a balance to be struck between what can reasonably be expected of all staff in terms of data literacy and what additional support should be provided.

	Students	Professional Services	Teaching staff				
Level 1 Knowing (What could I see?)	<u>Already covered in NF LA MOOC:</u> General and Institutional Definition of What is the academic management role of LA? - roles of different staff, mi & macro LA.						
<u>NF competencies:</u> Having a good	<u>Ethics and privacy:</u> what are student rights w.r.t. their data; what are legal, ethical and moral uses of student data; what is good practice w.r.t. analysis of student data.						
challenges and opportunities of	<u>Risks & limitations</u> : Aware limitations, risks and sour	ness of the potential of LA; ces of error. Impact of inac	and awareness of curate data.				
Familiarity with the data available to teaching	Data: Familiarity with the data available to students and how it could be used.	Familiarity with the data available to professional services and how it could be used.	Familiarity with the data available to teaching staff and how it could be used.				
stall (eg VLE reports)	Policy: The role of LA policy; principles of LA						
l evel 2	<u>Understanding data / data literacy:</u> Correct interpretation of common data visualisations. Using data visualisation tools (like Power BI), e.g. data filters.						
Level 2 Using and practicing (How could I interpret LA?) <u>NF competencies:</u> Having a familiarity with good practice, in line with current research;	Interpretation: Interpreting student facing LA	Interpreting analytics relevant to professional services staff	Interpreting analytics relevant to teaching staff				
	<u>Access:</u> How to access data available to students	How to access data available to professional services staff	How to access data available to teaching staff				
	Data Quality: How to assess data quality in data accessible to students	How to assess data quality in data accessible to professional services staff	How to assess data quality in data accessible to teaching staff				
	<u>Feedback:</u> Interpreting feedback; responding to intelligent agents.		How to design an assessment strategy to maximize data/insight into students' progress, using e-portfolios and how they can feed into LA for feedback.				

			Providing general feedback on progress; and specific feedback on learning outcomes. Appropriate use of intelligent agents for automated feedback.
		LA to aid Identifying and s disengaged students.	supporting struggling and
Level 3 Taking action (What can I do with LA, according to my role?)	Agency: Student agency: acting on <u>feedback</u> and insights from data.	Staff agency: Using data to improve services.	Staff agency: Using data to improve teaching practice; case studies.
<u>NF competencies:</u> Using data as an effective resource for supporting teaching	Reflection: What kind of decisions relevant to my learning process can be informed by LA? Training on reflection - how I learn?	LA to help staff in their work, rather than incr workload; Impact of LA on workload. What kind of decisions relevant to my work w be enhanced by LA? Training on reflection of practice - how do I teach?	

Table 13: Developing the content of the Daltai CPD framework

Conclusion

This report documents a study that developed a CPD framework for learning analytics based on feedback on training requirements from stakeholders. Stakeholder perspectives were collected using focus groups and surveys across HEIs in Ireland. A review of literature suggested data collection instruments should focus on training in: using, interpreting and acting on data; GDPR and ethics; policy; and boundaries between the role of front line staff and the role of a learning analyst. This was accomplished by augmenting the SHIELA framework protocols to include additional items on training. Analysis of stakeholder feedback highlighted that students were less interested in training than staff, but would welcome training on how to interpret dashboards, and their rights with respect to analysis of their data. Students also emphasised the importance of staff training on correct use and interpretation of data. Staff prioritize acting on data and correct

interpretation of data over being able to process data themselves. Clarification on ethical and legal uses of data in a learning analytics context was also a priority.

The resulting CPD framework presents three levels of training. Level 1, knowing, focuses on ethics and privacy, risks and limitations of data, appropriate uses of data for different stakeholders, and the role of learning analytics policy. Level 2, using and practicing focuses on data interpretation, data access, data quality, and using data for feedback. Level 3, taking action, focuses on action and reflection. The framework differentiates between the training requirements of different stakeholder groups, namely students, academic staff and professional services staff. Implementation of such a framework would need to consider concerns expressed by staff over increased workload, and a requirement for short training requirements would need to be revisited overtime in line with developments in both research and practice in this field.

A sample of training resources enacting elements of the CPD framework were also developed and are available on <u>https://www.cpdlearnonline.ie/</u>, hosted by GMIT. Further work is needed to enact remaining sections of the framework, and evaluate the impact of such resources to enable better use of data in an educational context.

References

- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa
- Carlsen, B., & Glenton, C. (2011). What about N? A methodological study of sample-size reporting in focus group studies. *BMC Medical Research Methodology*, *11*(1), 26. https://doi.org/10.1186/1471-2288-11-26
- Davey, J. W., Inc, F., Gugiu, P. C., & Coryn, C. L. S. (2010). *Quantitative Methods for Estimating the Reliability of Qualitative Data.*
- Donnelly, R., & Maguire, T. (2018). Ireland's National Professional Development Framework Summary Findings of the Initial Implementation. *National Forum for the Enhancement of Teaching and Learning in Higher Education*.

https://www.teachingandlearning.ie/publication/irelands-national-professional-

development-framework-summary-findings-of-the-initial-implementation/

- Molenaar, I., & Knoop-van Campen, C. (2017). Teacher dashboards in practice: Usage and impact. *European Conference on Technology Enhanced Learning*, 125–138.
- Murphy, T. (2018). A Review of the Existing Higher Education Policy Landscape for Digital Teaching and Learning in Ireland. *National Forum for the Enhancement of Teaching and Learning in Higher Education*. https://www.teachingandlearning.ie/publication/a-review-ofthe-existing-higher-education-policy-landscape-for-digital-teaching-and-learning-inireland-2/
- Scheffel, M., Tsai, Y.-S., Gašević, D., & Drachsler, H. (2019). Policy Matters: Expert Recommendations for Learning Analytics Policy. In M. Scheffel, J. Broisin, V. Pammer-Schindler, A. Ioannou, & J. Schneider (Eds.), *Transforming Learning with Meaningful*

Technologies (pp. 510–524). Springer International Publishing.

https://doi.org/10.1007/978-3-030-29736-7_38

- Sclater, N. (2016). Developing a code of practice for learning analytics. *Journal of Learning Analytics*, 16–42. https://doi.org/10.18608/jla.2016.31.3
- Whitelock-Wainwright, A., Gašević, D., Tsai, Y.-S., Drachsler, H., Scheffel, M., Muñoz-Merino, P. J.,
 Tammets, K., & Kloos, C. D. (2020). Assessing the validity of a learning analytics
 expectation instrument: A multinational study. *Journal of Computer Assisted Learning*,
 36(2), 209–240. https://doi.org/10.1111/jcal.12401
- Wise, A. F., & Jung, Y. (2019). Teaching with Analytics: Towards a Situated Model of Instructional Decision-Making. *Journal of Learning Analytics*, 6(2), 53–69–53–69. https://doi.org/10.18608/jla.2019.62.4
- Wong, B. T., & Li, K. C. (2020). A review of learning analytics intervention in higher education (2011–2018). *Journal of Computers in Education*, 7(1), 7–28. https://doi.org/10.1007/s40692-019-00143-7

Appendix I: Focus groups templates

Student focus group template

Student focus groups on educational data

Group facilitators:

[Read to the group at the start of each focus group, and handed out as an information sheet]

Learning analytics involves the collection of **educational data**, such as grades or number of accesses to online resources, to help us understand how students learn and engage in their studies. This **data** could be used by lecturers to improve course design and feedback, by student support services, or to develop an early alert system for those who may be at-risk of failing a course or dropping out. For example, analysis of Moodle data might indicate levels of student engagement on a course or module. If data analysis detects that a student's engagement has declined, it may alert their personal tutor to make contact and offer support. A learning analytics service ensures all students are included, and issues can be identified early.

As students will be one of the primary users of learning analytics, it is important that your opinions and expectations are accommodated into the design and implementation of any dashboards visualising your data. In the following interview, we will ask you a number of questions to understand your expectations and needs regarding a learning analytics service and the use of student educational data by TU Dublin. The interview will be recorded with audio devices for the purpose of subsequent analysis. It is important that we can link all comments that each person says (i.e. we can link a comment you make early in the session with a comment you make later in the session). Therefore your names will be used during the focus group discussions. However, when transcribing the audio recording to written text, all identifying information will be removed, and comments will be attributed to Student A, Student B etc. You will get a copy of this transcript to confirm it accurately reflects the discussion we had. Any uses of this data for publications will be strictly anonymous.

The audio recording we collect from you today will be stored securely on a college computer until it is converted to written transcript. It will then be destroyed (in approximately four weeks time). The anonymised written transcript will be kept for one year after the project ends.

The findings from this discussion will inform how future services are developed to ensure they reflect, and meet, student expectations and needs. It will also inform training students may need to engage with learning dashboards.

Before we start, are there any questions that you would like to ask?

Topics to be discussed:

Themes	Questions	Prompts
Transpar ency (5 mins)	Are you aware that your university has the ability to collect and analyse data about your actions in various learning environments (e.g., virtual learning environments, lecture attendance, library accesses)?	 a. What kinds of data do you think the university has been collecting from you? Are you aware that at the moment of enrolment into the university, you consented to let the university use your data for reporting and quality assurance purposes? b. In your opinions, are there any types of data that the university should not have collected? c. Is there clear information available to you on how the university collects and analyses your data? d. Is there clear information available to you on the purposes of collecting your data? e. If guidance was available, in what ways would you expect it to be presented and accessed?
Purpose (5 mins)	What would be legitimate purposes for the university to use your data?	 a. Should it be used to improve the university's service quality, such as resource allocation, teaching quality, curriculum design, etc.? b. Should it be used to improve the educational experience in a module/course/programme (e.g., identifying problems within a learning activity)? c. Should it be used to improve individual student's educational experience, e.g., identifying points of struggle or points of disengagement?
Education al Needs (10 mins)	Would you like the university to use your background and educational data to support you in areas that we just discussed?	 *Explain: Background data include previous educational attainment, demographic information etc. Educational data include data collected from any physical or virtual learning activity. a. Do you see any way to use such data to support your learning? b. What do you think would be an inappropriate way to use such data to support your c. learning?
Feedback (10 mins)	How would you like to receive feedback from the analysis of your educational data?	 a. Should it be in person (e.g., from your personal tutor)? b. Should it be in text (e.g., an email)? c. Should it be through visualisations (e.g., a dashboard)? d. What format (text, in person, visualisation) do you see as being the most useful for your own learning? e. How often would you like to receive feedback (e.g., every day, once a week)? f. Do you think there's a risk of having too much feedback? g. Should feedback present a comparison of your progress to your peers' progress

Interventi on (10 mins)	How should teaching staff and tutors approach the analysis of your data?	a. Should they have an obligation to act if you are identified as being at-risk of failing or underperforming in a module?b. Should the university give students the option to refuse the support?c. Should any specific kind of training be given to teaching staff to understand the analysis of your educational data and to accommodate the results into your personalised feedback?
Concerns (10 mins)	Are there any concerns you would have towards the way the university uses your data?	a. Ethical and privacy concernsb. The accuracy of analytics resultsc. The quality of feedback (e.g., meaningful and understandable)d. The relevance to your own learning objectives
Training (10 mins)	Should the university provide you with training on data literacy?	 Should you get training on how to interpret visual data from a dashboard? Should you get training on data protection an ethical uses of your personal data? Would you like training on GDPR covering <i>Consent</i> and <i>Ownership and Autonomy (as per points above in blue)</i> Should you get training on interpreting statistics or other numeric measurements derived from your personal data? Should you get training on Limitation of data analytics, and the dangers of reading too much into analytics results based on your digital footprint, which can never be the full story.

Staff focus group template

Staff focus groups on educational data



Group facilitators: _____

[Read to the group at the start of each focus group and handed out as an information sheet]

Learning analytics involves the collection of educational data, such as grades or number of accesses to online resources, to help us understand how students learn and engage in their studies. This data could be used by lecturers to improve course design and feedback, by student support services, or to develop an early alert system for those who may be at-risk of failing a course or dropping out. For example, analysis of Moodle data might indicate levels of student engagement on a course or module. If data analysis detects that a student's engagement has declined, it may alert their lecturer/tutor to make contact and offer support. A learning analytics service ensures all students are included, and issues can be identified early. For course leaders/programme directors, learning analytics can allow users to review the progress of a group of students for the purposes of reviewing/redesigning the course/programme if problems are detected. In addition, learning analytics can collect and analyse data about teaching practice (e.g., number of learning materials uploaded, interactions with students in forums, feedback for students) to enable self-reflection for teaching staff.

As academic and professional services staff will be one of the primary users of learning analytics, it is important that your opinions and expectations are accommodated into the design and implementation of any developed services. In the following interview, I will ask you a number of questions to understand your expectations regarding a learning analytics service and the use of student educational data by TU Dublin. The interview will be recorded with audio devices for the purpose of subsequent analysis. It is important that we can link all comments that each person says (i.e. we can link a comment you make early in the session with a comment you make later in the session). Therefore your names will be used during the focus group discussions. However, when transcribing the audio recording to written text, all identifying information will be removed, and comments will be attributed to Person A, Person B etc. You will get a copy of this transcript to confirm it accurately reflects the discussion we had. Any uses of this data for publications will be strictly anonymous.

The audio recording we collect from you today will be stored securely on a college computer until it is converted to a written transcript. It will then be destroyed (in approximately four weeks time). The anonymised written transcript will be kept for one year after the project ends. The findings from this discussion will inform how future services are developed to ensure they reflect, and meet, student expectations and needs. It will also inform training staff and students may need to engage with learning dashboards.

Themes	Questions	Prompts			
Purpose	Learning analytics benefits from a range of education data including academic data, personal data, and engagement data collected from online or physical learning environments. What do you think would be legitimate purposes for the college to use such data?	 a. Should it be used to improve service quality, such as resource allocation, b. teaching quality, curriculum design, etc.? c. Should it be used to improve the educational experience in a course/programme (e.g., d. identifying problems within a learning activity)? e. Should it be used to improve an individual student's educational experience, e.g., f. identifying points of difficulty or points of disengagement? g. Should it be used to inform you about your teaching practice? 			
Teaching needs	What kinds of information would be particularly useful to you in improving students' educational experience.	 a. Academic data (e.g., assessments, educational history) b. Engagement data (e.g, log-ins, clicks, library visits, video watching activities, attendance, forum discussions) c. Personal data (e.g., background data, sensitive data) d. Student survey responses e. Utilisation of college services and facilities f. How would you like it to be presented to you? 			
Teaching needs	What kinds of information would be particularly useful to you in your professional development?	a. Data about students (see prompts in the previous question)b. Data about your teaching practice and how it influences the engagement and achievement of your students?c. How would you like it to be presented to you?d. Is programme level data as useful as module level data - what data is useful at programme level?			

Before we start, are there any questions that you would like to ask?

Teaching needs	[Dashboard Handout] Here are some examples of ways the college could use learning analytics to enhance learning and teaching. Which of these do you think would be useful (multiple choices)? Please pick one to share why it is useful or not useful after the poll. (or One thing you like; one thing you don't like)	 Useful for: a. To improve the relationships between students and teaching staff and professional services teams. b. To improve the overall learning experience and well-being of students c. To identify a student's weaknesses in learning and suggest ways to improve upon this d. To alert teaching staff early if students are at-risk of failing a course or if they could improve their learning e. Identify the optimum pathway for students to achieve their learning goals f. Present students with a complete profile of their learning in each and every course g. Present teaching staff or tutors with a complete learning profile of their students h. Present teaching staff or tutors with a profile of their teaching practice and how it influences the engagement and achievement of their students. i. To notify professional services staff of changes in behaviour or patterns of disengagement that may indicate students require additional support.
Training	What training would be useful to enable you engage with student data?	 Should staff get training on: a. How to interpret visual data from a dashboard? b. Data protection and ethical uses of combining data from different sources, analysis of the data, and the labelling of students (e.g. at risk) as a results of data analytics? c. Uses of data and the questions it can answer (What would you like to be able to do? What would be useful at staff meetings / course board meeting) d. Interpreting statistics or other numeric measurements derived from students personal data? e. Limitations of learning analytics, and the dangers of inferring a label (such as at-risk) based just on a digital footprint, which can never be the complete story. g. Combining your own data sources and doing some analysis. 1. How to access data 2. Open spreadsheet data; csv data; merge sources - primary key 3. Transforming data: dates; inserting keys like module codes & programme codes

Concerns	Are there any concerns you would have in incorporating learning analytics into your job?	 a. Ethical and privacy concerns b. The accuracy of analytics results c. Capability and capacity d. Usefulness e. Pedagogical approaches f. Interaction with students
Interventio n	How do you think staff should approach the analysis results of student data? Module level or programme level data?	a. Should they have an obligation to act if students are identified as being at-risk of failing or underperforming in a module?b. Should any specific kind of training be given to teaching staff to understand the analysis of student data and to accommodate the results into the feedback for students?c. Should interventions be automated?

Consent forms for focus groups



To be completed by all focus group participants, and signed by a me	mber of the project team				
Have you been fully informed/read the information sheet about this stud	y? YES/NO				
Is your participation given voluntarily ?	YES/NO				
Have you had an opportunity to ask questions and discuss this study?	YES/NO				
Have you received satisfactory answers to all your questions?	YES/NO				
Have you received enough information about this study and any associat safety implications if applicable?	ted health and YES/NO				
 Do you understand that you are free to withdraw from this study? at any time without giving a reason for withdrawing 					
• without affecting your future relationship with the Institute	YES/NO				
Do you agree to take part in this study the results of which are likely to b	pe published? YES/NO				
Have you been informed that this consent form shall be kept in the confi of the researcher?	dence YES/NO				
Participant Signature	Date				
Name in block letters					
Signature of project team member Date					

Appendix II: Student and staff surveys

Student survey



Examining Student Expectations of Learning Analytics

You have been asked to participate in this 5 MINUTE SURVEY (14 QUESTIONS IN TOTAL) to investigate your expectations of a learning analytics service and the use of your educational data by your University/Institute of Technology/College. By asking you these questions, we aim to understand what you desire from a learning analytics service (e.g. what you ideally hope for) and what is the minimum standard that you expect from the service (e.g. what you expect to happen in reality).

Learning analytics involves analysing students' educational data - such as grades, attendance and Virtual Learning Environment (VLE) data (i.e. access patterns taken from Brightspace, Moodle, Canvas or Sakai) - to better understand how students learn and engage in their studies. This data can be used to improve the structure of your programme, identify and help students who may be at-risk of failing or dropping out, provide personalised learning environments, and improving student feedback processes. For example, this data might identify a better way to organise student timetables, or highlight online resources that students find useful (or not useful) prior to an assessment or exam. It may also alert personal tutors about students that may need additional feedback and support.

With the COVID-19 closures, this data – or students' digital footprint - is becoming even more important. Given that our campuses are now closed, students' online engagement with institutional platforms and resources are now a key indicator of student engagement. In light of this, and because the ultimate goal of learning analytics is to enhance teaching and learning provision and broader support for students, it is important that your opinions and expectations are taken into account when designing and implementing learning analytics services.

By completing this survey, you will provide a critical insight into how students' expect universities/colleges to gather, analyse and use their educational data and for what purposes. The findings from this survey will inform how future higher education services are developed to ensure they reflect, and meet, the expectations and needs of you and your peers. Participants can choose to be included in a draw for one of five €20 Amazon gift vouchers.

Results from this survey will be made publicly available by the Daltaí project (https://daltaihe.ie/), funded by the National Forum for the Enhancement of Teaching and Learning. All responses are anonymous. Data will be stored in a secure location and deleted when the project completes in June 2020.

For further information feel free to contact: TU Dublin Blanchardstown campus: Geraldine.Gray@tudublin.ie TU Dublin City campus: Pauline.Rooney@tudublin.ie TU Dublin Tallaght campus: James.Doody@tudublin.ie Galway-Mayo Institute of Technology: Phelim.Murnion@gmit.ie

I have read the information above. * $_{\circ}$ Yes

I confirm that I am aged 18 years or over. * $_{\odot}$ Yes

The anonymous feedback given in this survey can be used within reports, articles and/or conference presentations.*

þ Yes

I am studying at...* (a list of all Irish HEI's is provided as a dropdown box)

Section 2: Learning Analytics Survey

1. Do you know what data is collected about you and your activities by your college?

- $\,\circ\,$ Yes I am fully aware of all data that my college collects about me
- $\,\circ\,$ I am somewhat aware of the data my college collects about me
- $\,\circ\,$ I am not aware that my college collects data about me
- $\,\circ\,$ I am not fully aware but I know how to find out.

- 2. Do you know your rights in relation to personal data that is held by your college?
 - Yes I am aware of my rights
 - No I don't know my rights
 - $\circ\,$ I am not fully sure of my rights but I know how to find out

Below you will find a series of statements, each one followed by two questions: what you would like to happen; and what you expect to happen.

á	a. Ido ha	eally, ppen	I wo	ould	like	this to	0		b. le	expect	this t	o happ	oen in	reality
Stro Disa	ongly agree					Strongl Agree	y e	Stro Disa	ngly gree				S	trongly Agree
1	2	3	4	5	6	7		1	2	3	4	5	6	7

Note: Statement 3 to 14 were each followed by the following two Likert scales:

- 3. My college will ensure that all my educational data will be kept securely.
- 4. My college will regularly update me about my learning progress based on the analysis of my educational data.
- 5. My college will request consent if my educational data is being used for a new purpose.
- 6. The learning analytics service will be used to promote student decision making (e.g., encouraging you to adjust your set learning goals based upon the feedback provided to you and draw your own conclusions from the outputs received).
- 7. The learning analytics service will show how my learning progress compares to my learning goals/the course objectives.
- 8. The learning analytics service will present me with a complete profile of my learning across every module (e.g., number of accesses to online material and attendance).
- 9. The teaching staff will be competent in incorporating analytics into the feedback and support they provide to me.
- 10. The teaching staff will have an obligation to act (i.e., support me) if the analytics show that I am at-risk of failing, underperforming, or if I could improve my learning.

11. The feedback from the learning analytics service will be used to promote academic and professional skill development (e.g., essay writing and referencing) for my future employability.

12. For what purposes would you like your college to use student data?

(All statements were ranked using a 4 point scale: Very important; Quiet important; Not important but nice to have; Not important at all)

Very important	Quite important	Not important but	Not important at all
\bigcirc	\bigcirc	\bigcirc	\bigcirc
 To improve cat To improve ind To identify stu To identify stu To improve teat 	mpus services dividual student's educ dents who are struggli dents who are disenga aching quality	cational experience ing aged	

- To improve course design
- To improve feedback

If you would like to be included in a draw for one of five €20 Amazon gift vouchers, enter the email address below that you would like the voucher to be sent to. The draw will take place on May 18th. All email addresses will be deleted once the draw takes place.

Staff survey



Examining Staff Expectations of Learning Analytics

You have been asked to participate in this 10 MINUTE SURVEY (24 QUESTIONS IN TOTAL) to investigate your expectations of a learning analytics service and the use of students' educational data by your University/Institute of Technology/College. By asking you these questions, we aim to understand what you desire from a learning analytics service (e.g. what you ideally hope for) and what is the minimum standard that you expect from the service (e.g. what you expect to happen in reality).

Learning analytics involves the collection of educational data - such as grades, forum discussions, assessment submissions, attendance, or number of accesses to online resources - to better inform how students learn and engage in their studies. This educational data can be used to improve teaching practices, personalise learning environments, inform support services, and enhance student feedback processes.

For example, the collection of a student's Virtual Learning Environment (VLE) data (e.g., hours spent online) can be used to determine whether a student is above or below the average level of engagement required for the course. If the service detects that the student is below the average level of engagement required, it may alert their personal tutor and/or lecturers. For course leaders/programme directors, learning analytics can allow users to review the progress of a group of students for the purposes of reviewing/redesigning the course if problems are detected.

As a key stakeholder in the collection and potential use of student-related data, it is important that your opinions and expectations are accommodated into the design and implementation of any developed services. With recent COVID-19 closures, student data is becoming even more important as an indicator of student engagement. In light of this, and because the ultimate goal of learning analytics is to enhance teaching and learning provision and broader supports for students, it is important that your opinions and expectations are taken into account when designing and implementing learning analytics services.

Results from this survey will be made publicly available by the Daltaí project (https://daltaihe.ie/), funded by the National Forum for the Enhancement of Teaching and Learning. All responses are anonymous. Data will be stored in a secure location and deleted when the project completes in December 2020.

This survey has been adapted from the SHEILA project framework (sheilaproject.eu). For further information contact: Geraldine.Gray@tudublin.ie (TU Dublin Blanchardstown campus) Pauline.Rooney@tudublin.ie (TU Dublin City campus) James.Doody@tudublin.ie (TU Dublin Tallaght campus) Phelim.Murnion@gmit.ie (Galway-Mayo Institute of Technology)

I have read the information above.

 $\circ \, \mathrm{Yes}$

The anonymous feedback given in this survey can be used within reports, articles and/or conference presentations.

 $\circ \, {\rm Yes}$

Que	estion:	Options:		
1.	Gender:	Male, Female, Other, Prefer not to say		
2	I work at	A list of HEIs in Ireland, an option for outside of Ireland, and other .		
3	Please indicate your role/department within the institution	Academic, Library, ICT Services, Other Professional Services & Support Staff		
Please	jump to question 4 if answering questi	ons 3a to 3c may identify you.		

Part 1 of 2: Demographic data and your perspective on analysis of student data

За	If you are a member of Professional Services/Support Staff, please tell us which department/service you are located in.	Text box
3b	If you are an academic member of staff, please indicate your role within your institution.	Assistant Lecturer; Lecturer,; Senior Lecturer; Head of Department/Assistant Head of School; Other.
3c	If you are an academic member of staff, what area does the subject you are teaching fall under? (select one option)	Sciences; Engineering/Built Environment/Horticulture; Social Sciences; Art and Humanities; Tourism; Business; Other

Below you will find a series of statements followed by some questions. Please answer all as accurately as possible. The term 'Learning Analytics Service' refers to any means of analysing student data.

Note: Statement 4 to 18 were each followed by the following two Likert scales:

a. Ideally, I would like this to happen

b. I expect this to happen in reality

Strongly Disagree				Strongly Agree		Strongly Disagree				Strongly Agree				
1	2	3	4	5	6	7		1	2	3	4	5	6	7

- 4. I will be able to access data about my students' progress in a module (course) that I am teaching/tutoring.
- 5. I will be able to access data about other modules (courses) my students are currently studying to get a programme level perspective.
- 6. I will be able to access data from previous modules (courses) that are related to my module, to get a historical perspective.
- 7. My Institute will provide me with guidance on how to access learning analytics about my students.

- 8. My Institute will provide staff with opportunities for professional development in using learning analytics for teaching
- 9. My Institute will facilitate open discussions to share experience of learning analytics services.
- 10. The learning analytics service will allow students to make their own decisions based on the data they receive.
- 11. All data collected and presented to staff and students will be accurate (i.e. free from inaccuracies such as incorrect grades or attendance records).
- 12. The learning analytics service will show how a student's learning progress compares to their learning goals/the module (course) objectives.
- 13. The feedback from the learning analytics service will be presented in a format that is both understandable and easy to read.
- 14. The learning analytics service will present students with a complete profile of their learning across every course/module (e.g., number of accesses to online material, learning outcomes, and attendance).
- 15. The teaching staff will be competent in incorporating analytics into the feedback and support they provide to students.
- 16. The teaching staff will have an obligation to act (i.e., support students) if the analytics show that a student is at-risk of failing, underperforming, or that they could improve their learning.
- 17. The feedback from the learning analytics service will be used to promote students' academic and professional skill development for their future employability.
- 18. The use of learning analytics will allow me to better understand my students' learning performance.
- 19. Are there any comments you would like to add about the statements in this section?

Part 2 of 2: How to enable better use of data at your University / Institute:

20. For what purposes would you like your college to use student data? To... (All statements were ranked using a 4 point scale: Very important; Quiet important; Not important but nice to have; Not important at all)

Very important	Quite important	Not important but	Not important at all

- Improve campus services •
- Improve individual students' educational experience
- Better understand students' needs
- Provide evidence to inform policy
- Improve course/module/programme design
- Improve teaching quality
- Get feedback on a specific teaching initiative
- Provide timely information on class differences, e.g. if this years class is stronger/weaker academically than a previous year
- Provide insights into learner engagement
- Highlight useful resources to students
- Improve student feedback (timeliness/quality)
- Identify students who are struggling
- Identify students who have disengaged
- Trigger an intervention with a student
- Enable students track their own progress
- 21. How should a learning analytics service be implemented in your University / Institute? (You may select more than one.)

As a resourced function that can create customised (GDPR compliant) visualisations or data analysis for staff.

As a tool with pre-defined analysis and visualisations of the data we are permitted to access.

As professional development training to allow staff do their own data analysis As part of professional development training in good pedagogical practice Other

22. Would training in the following areas be useful to you?

(All statements were ranked using a 5 point scale: Very useful; Somewhat useful; Neutral; Slightly useful; Not useful).



- What learning analytics means / is
- What data can we use and what can we do with it?

- Understanding the limitations of data
- Ethical and moral considerations of analysing student data
- How to ensure analysis of data is GDPR compliant, and when is consent needed
- Which policies are relevant and who is responsible
- How to identify questions that learning analytics can answer
- Assessing the quality of data
- How to anonymise or pseudo anonymise data, and when is that needed
- How to create visualisations from my own data
- How to correctly interpret visualisations of data
- How to act on information from analysis of student data
- 23. How should training be delivered? (You may select more than one.)
 - Online repository of resources that I can access in my own time
 - Online seminars (webinars)
 - Face to face workshops/seminars
 - Accredited professional development course/certificate
 - As a series of professional development badges
 - As a MOOC (massive open online course)
 - Other

24. Do you agree with the following?

	Yes	No
I am comfortable identifying questions about my teaching practice that data analysis can answer	\bigcirc	\bigcirc
I believe it is possible to collect data about student learning that can inform teaching practices	\bigcirc	\bigcirc
I have done some analysis myself on data I collect from classroom activities	\bigcirc	\bigcirc
While all analysis of student data will lack the full context for each student, some analysis is useful	\bigcirc	\bigcirc
I understand what I can legally and ethically do with student data	\bigcirc	\bigcirc

I believe my college has the appropriate infrastructure to collect	\bigcirc	\bigcirc
relevant data		
I believe my college has appropriate policies in place to cover	\bigcirc	\bigcirc
analysis of student data		

Are there any additional comments you would like to add?