

A Guide to Learning Analytics

Uses, Research and Recommendations from the School of Health in Social Science



THE UNIVERSITY *of* EDINBURGH
School of Health in
Social Science

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Learning Analytics

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Introduction

Learning analytics is:

“the measurement, collection, analysis and reporting of data about learners and their context, for purposes of understanding and optimising learning and the environments in which it occurs”
- Society for Learning Analytics Research

In other words, using data to better inform future decisions about learning and teaching.

The aim of this guide is to explain how learning analytics can be an insightful aid for staff in the university.

The information found within this guide is a combination of the anecdotes, ideas and insights that have come from interviewing colleagues around the school, and the findings from personally experimenting with the analytics tools.

Learning Analytics at the University



Figure 1 The TEL Strategy timeline for the School of Health in Social Science

Learning Analytics is the fifth and final stage of the [TEL Strategy](#) for the School, but since 2014, there has not been much emphasis on increasing the uptake of it, with a large majority of staff not using learning analytics at all. The reasons for this seem to be that most are not aware of the tools available to them or why they should use them, and/or they do not have the time to research how to do it. However, there are some examples of learning analytics being used now around the university:

- One support staff colleague recalled that a member of staff believed attendance had dropped off for their tutorials towards the end of the semester, but after they checked the data, they found that that wasn't the case; analytics is useful for checking assumptions and potentially spotting other patterns.

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- The tracking of attendance and engagement of students, particularly those on Tier 4 visas. Using data is likely to be more accurate than memory for this.
 - The School of Mathematics shares some anonymised data with students. For example, showing a graph comparing the attendance to tutorials of the previous year's cohort versus their final grade may be motivational for students, or showing the lengths of time students spent on an online quiz would allow students to see how they compare to the cohort and seek support if they feel they are behind. Whilst some students may not find this useful and it may not be possible to do due to a small group size, it is worth considering.

Who is Responsible for Doing Learning Analytics?

Meeting with colleagues has highlighted that no one group of staff thinks generating analytics is their responsibility. This means that if it is to be successfully integrated into improving understanding of courses and programmes, then clear roles need to be assigned to different groups of staff, and this may need to come from senior colleagues in the school.

Most of the available analytics are carried out at a course level, so analytics is likely to be most relevant to Course Organisers and Lecturers that want insight into the effectiveness of their teaching and how students actually use the course. Some analytics, however, are designed to flag students that may be having difficulties, so this information will be most relevant to Personal Tutors and support staff for the course/ programme. As a result, programme teams should also decide who is responsible for different kinds of analytics.

What Learning Analytics are Available?

Different kinds of analytics are suited to being done during and after a course; during a course, analytics will be focused on monitoring engagement, but after a course, analytics will be used for evaluation. At both times, the aim is that learning analytics will ensure course leaders better understand how their students are learning and how their course is functioning.

A crucial factor in learning analytics being used is that for Learn to collect any data, the 'statistics tracking' for each individual piece of content needs to be manually turned on by staff; it is not currently possible to have it turned on automatically. This means that if it has not been turned on manually in the past, the data won't be there now to review. Similarly, if it isn't turned on now in advance of the upcoming semester, then it won't be available to review in the future. It is possible that students may change their behaviour if they know their data is being reviewed by staff. However, it may be already be a positive outcome if it does encourage students to log in to their course page.

The following sections explain how to use the available analytics tools and their uses:

Lecture Recordings - Echo 360 / Media Hopper Replay

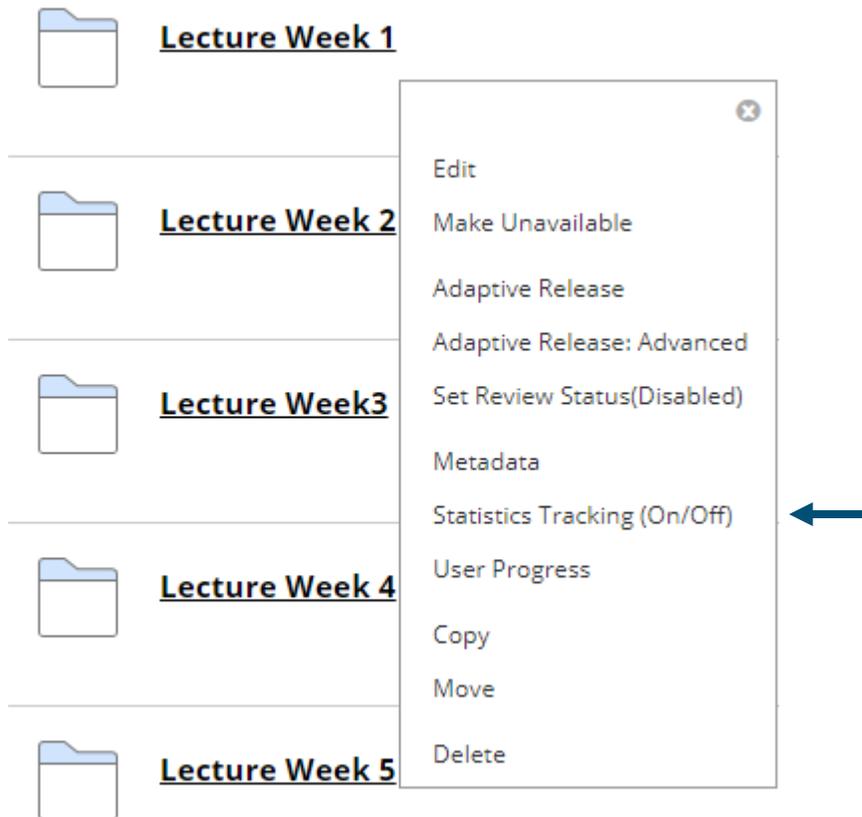


Figure 2.1 Screenshot showing where to find the Statistics Tracking button

There are analytics within the lecture recording system that staff can view for their own course, and there is also an administrator view for the school/college which holds more information. Lecturers can see the number of views each recording has had, which gives a good indication of the proportion of the cohort that are using them. Lecture recordings can be used as a revision aid and to cover necessary absence.

If numbers are low, it could be because most students come to the real lecture and don't feel the need to cover the content again. Similarly, if numbers are high, that may suggest that most students prefer to watch the recording than go to the lecture, or that the content was difficult, so students went over it again. Even weather and location of the lecture can impact the number of students attending (known through personal experience), so bear this in mind when reviewing the data.

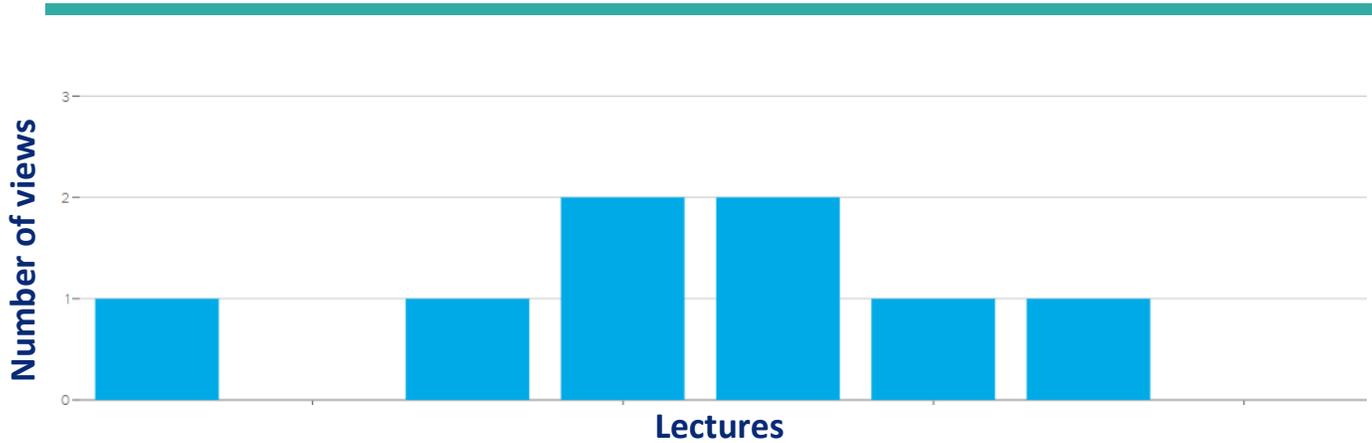


Figure 2.2 Echo 360 graph showing number of views each lecture has had in a course

There are limitations with the analytics available on Echo 360 e.g. it is not possible to see the engagement of a specific student across all their courses, such as which lectures they have viewed and when, and it is not possible to see number of views of a lecture over a period of time, even as an administrator. This data would flag up lack of engagement and students having difficulties more easily. It would also allow staff to identify whether students only start watching lecture recordings during revision periods, or if the recordings are used a great deal during the teaching period as well.

If staff have more data to understand how their students learn, they can better decide how to structure the course in future and which areas to focus on.

For programme directors there is an issue with the analytics, because it is not possible to select a programme and view the lecture data for students on that programme, even in administrator view. This is due to a lack of categorisation being possible in Echo 360, but this could be overcome by exporting the data to Excel for the courses within a programme.

Tutorials

Attendance to tutorials is often recorded manually, so support staff manually check for students that haven't attended regularly. It would therefore be helpful if this data was put into EUCLID or Learn and then students not attending were automatically flagged, perhaps automatically sending them an email to remind them to attend. TopHat is also a useful way to track attendance.

Learn Evaluation Tools

The Learn Evaluation tools are split into three categories that provide different data regarding student engagement within the course: Course Reports, Performance Dashboard and Retention Centre.

The data in the Learn evaluation tools is not always completely accurate e.g. a single click can sometimes be counted twice. However, they can be used to give an indication of the engagement of students. Information Services are updating the evaluation tools for the academic year 2019/20 which they expect will resolve the inaccuracies and improve the built-in reports.

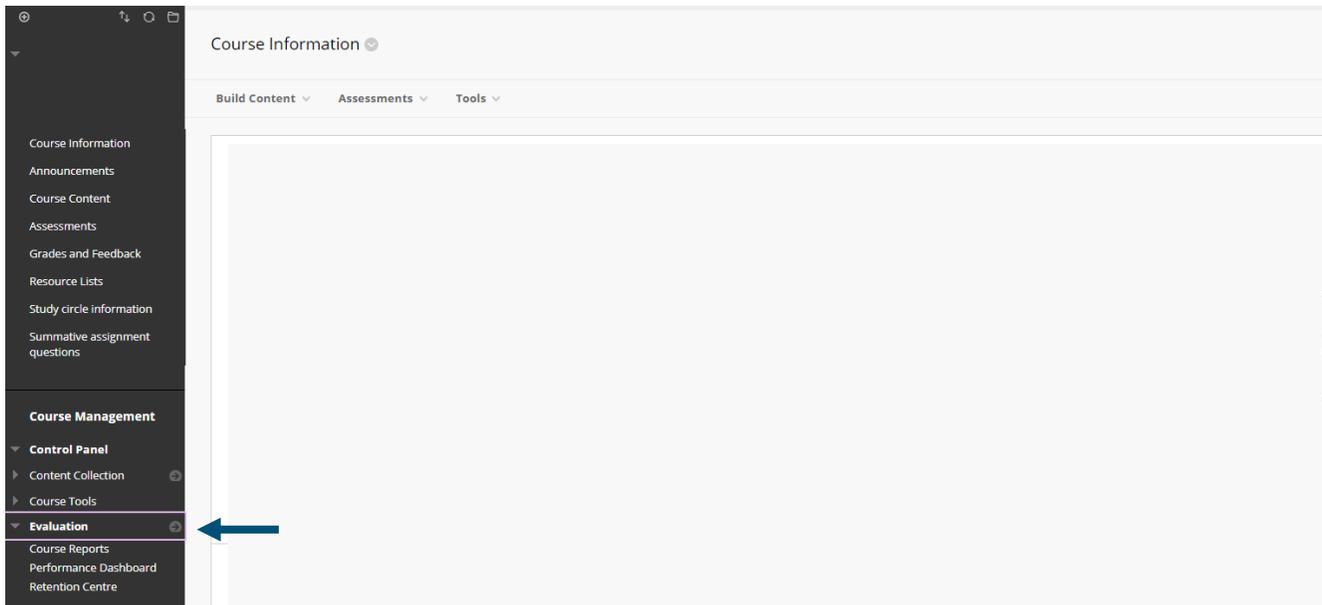


Figure 3 Screenshot showing where to find the Learn Evaluation tools

For all Learn analytics, the data is only stored on Learn for 180 days so you cannot do Learn’s analytics on courses from over 180 days ago. For example, running the reports in August won’t allow you to go back to the start of courses in semester 2 (as that is over 180 days previously), so the analytics should be done within 180 days from the start of the course.

Course Reports (8 types)

To run the reports:

- Go to ‘Course Reports’ in the Evaluation bar,
- Press the report you want, and press ‘Run’
- Select a start date the students you want to be included (Ctrl + A to select all).

All User Activity inside Content Areas

This report gives:

- The number of ‘hits’ that each content page on the Learn site has had overall.
- The clicks per student in the course and when - useful to spot any areas that students aren’t accessing much.
- A timeline of total clicks in the course at a cohort level.

It can be viewed in PDF, Excel, HTML or Word format.

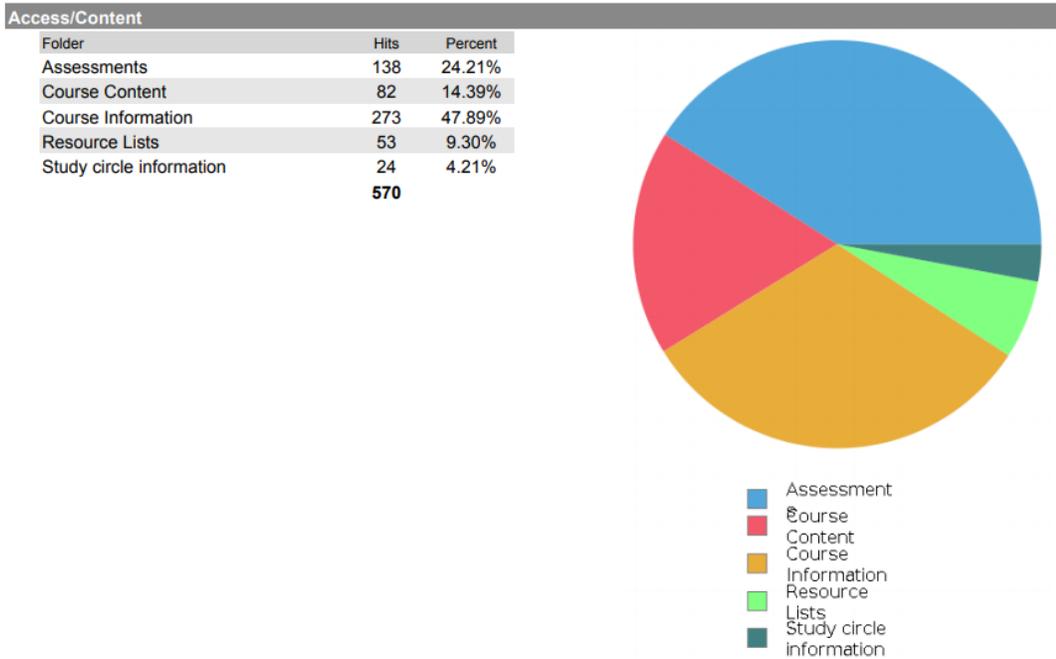


Figure 4.1 An example of a section of the All User Activity inside Content Areas report, showing data about the cohort's activity

	Assessment	Course Content	Course Information	Resource Lists	Study circle information	Total
	5	0	10	4	0	19
	0	1	1	0	0	2
	0	1	5	0	0	6
	16	20	35	12	3	86
	2	6	25	5	15	53
	0	0	0	0	0	0
	1	0	7	1	2	11
	31	0	30	0	0	61
	6	6	23	5	0	40
	0	7	9	2	0	18

Figure 4.2 An example of a section of the All User Activity inside Content Areas report, showing the activity of individual students

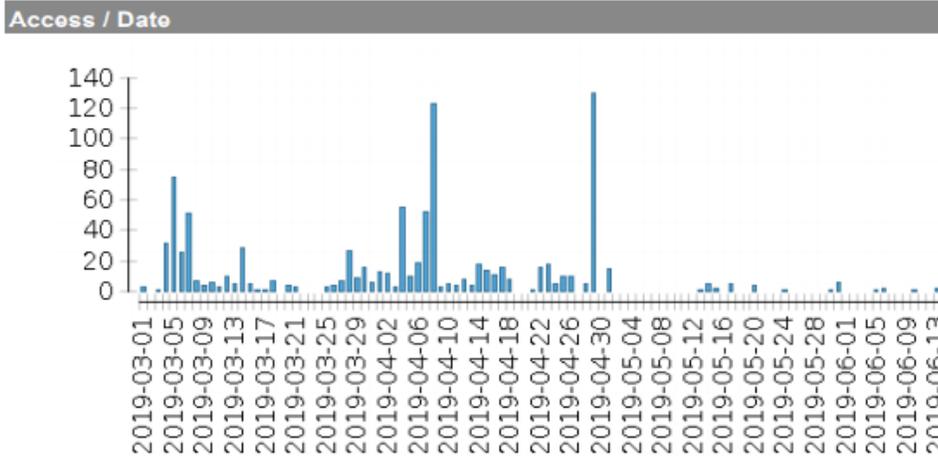


Figure 4.3 An example of a section of the All User Activity inside Content Areas report, showing total access across the cohort each week

Course Activity Overview

This gives two graphs: the first shows the average time the cohort spends on the course on each day of the week, and the other shows the total time each student has spent in the course over the specified dates.

It may not always be a positive if a student is spending a long time on a course, however, as it may suggest they are finding it difficult. If this is a concern, the course could have some features such as 'mark as reviewed' added to key areas to allow further tracking of student progress. Since there are many ways to interpret this data, careful consideration is needed, but is likely to be insightful.

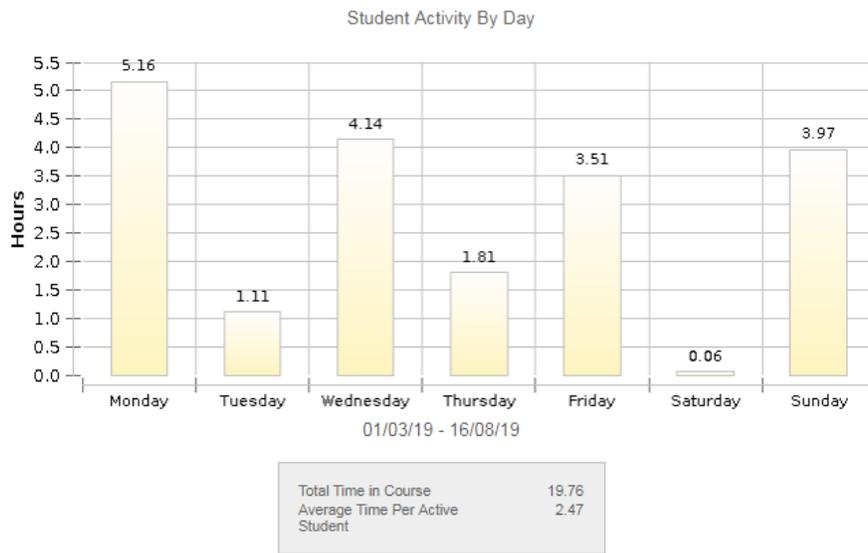


Figure 5.1 A graph showing the total time the cohort has spent on the course each day of the week

Student Overview (9 Students)

Click a bar to view a student's individual activity.

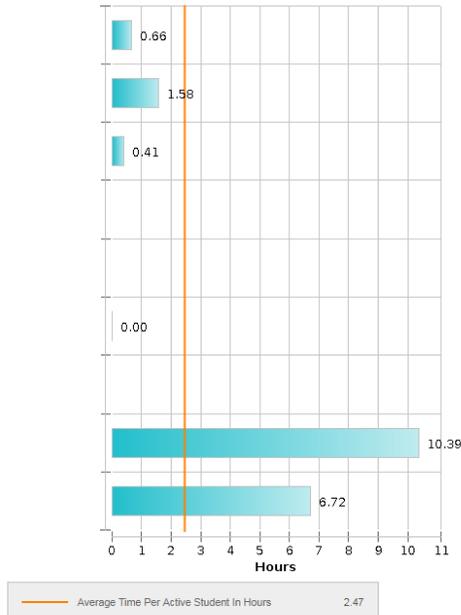


Figure 5.2 Graph showing how much time each student has spent in the course (student names have been removed here), where the orange line represents the average and each bar represents a student

Course Performance

For this report, staff have to choose a 'goal' which the cohort is then compared against. However, the goals can only be set by the university and not individual members of staff, and as yet no goals have been created, so this report is currently not in use.

Overall Summary of User Activity

This is a long report with multiple sections that appear in the following order:

- A list and pie chart showing number of clicks on each tool in the course.
- In alphabetical order of students, tables show the number of clicks per person on each tool, with 'content' as one item which presumably includes whole course.
- A graph showing the number of clicks in the course each week.
- In alphabetical order, tables show the number of clicks per student per day of the month. It does this for every month since start of report.
- Graph and table showing the total clicks in the course per hour of the day.
- Graph and table showing the total clicks in the course per day of the week.

Access / Hour of Day

Hour of Day	Hits	Percent
0	11	0.88%
1	10	0.80%
2	3	0.24%
3	0	0.00%
4	18	1.45%
5	32	2.57%
6	3	0.24%
7	12	0.96%
8	44	3.54%
9	46	3.70%
10	193	15.51%
11	152	12.22%
12	186	14.95%
13	66	5.31%
14	127	10.21%
15	78	6.27%
16	42	3.38%
17	49	3.94%
18	43	3.46%
19	8	0.64%
20	29	2.33%
21	17	1.37%
22	38	3.05%
23	37	2.97%

1244

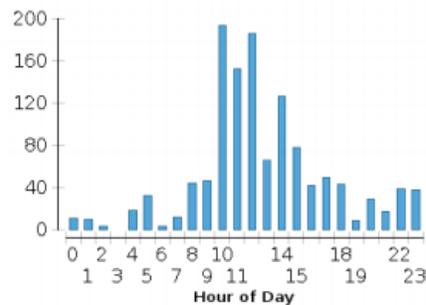


Figure 6.1 Table and graph showing the number of clicks across the cohort at each hour of the day to show times of high and low activity

Access / Day of Week

Day of Week	Hits	Percent
MON	399	32.07%
TUE	171	13.75%
WED	186	14.95%
THU	243	19.53%
FRI	98	7.88%
SAT	46	3.70%
SUN	101	8.12%

1244

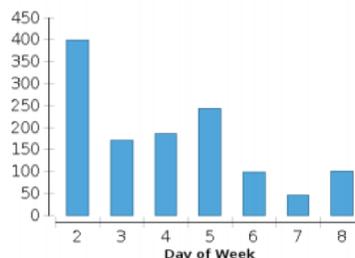


Figure 6.2 Table and graph showing the number of clicks across the cohort on each day of the week to show times of high and low activity

Single Course User Participation Report

The official description of this report is “detailed statistics on assessment and collaboration tool submissions for all users in this course during a specified timeframe”. This report will only give data if certain tools are being used in the course, such as discussion boards. Individual student data will show up in this report showing the number of discussion board submissions and the date of the most recent.

	A	B	C	D	E	F	G	H	I	J	K
	First Name	Last Name	User ID	Student Batch UID	Available in System	Course ID	Course Batch UID	Most Recent Discussion Board Submission	Total Discussion Board Submissions	Most Recent Submission	Total Submissions
1					Y			3/6/2019 17:02:08	1	3/6/2019 17:02:08	1
2					Y			3/20/2019 16:21:38	9	3/20/2019 16:21:38	9
3					Y			3/20/2019 16:19:41	9	3/20/2019 16:19:41	9
4					Y			3/26/2019 19:00:58	15	3/26/2019 19:00:58	15
5					Y			3/3/2019 13:21:02	1	3/3/2019 13:21:02	1
6					Y			3/24/2019 11:34:57	4	3/24/2019 11:34:57	4
7					Y			3/24/2019 18:30:54	4	3/24/2019 18:30:54	4
8					Y			3/16/2019 15:00:34	9	3/16/2019 15:00:34	9
9					Y			3/22/2019 11:26:22	3	3/22/2019 11:26:22	3
10											

Figure 7 An example of the Single Course User Participation Report – personal data blurred out

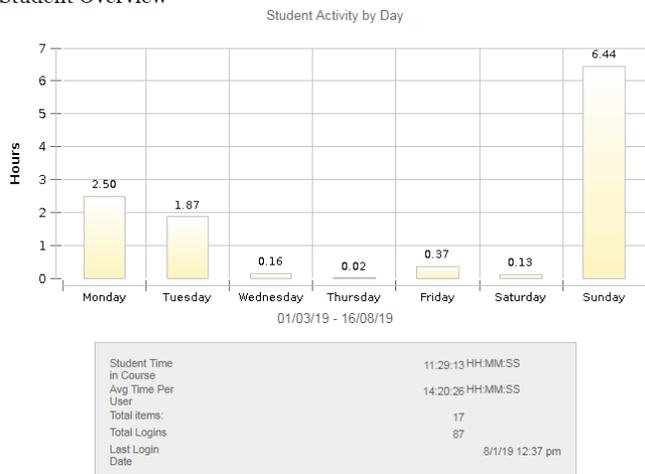
Student Overview for Single Course

This report gives information about a particular student on the course, including:

- Number of times they have logged in to the course
- When their last login was
- How many times they have accessed items of content in the course
- Their total time in the course
- Their total time on each day of the week in the course

For individual data on discussion board submissions, see the Single Course User Participation Report.

Student Overview



Student Activity by Item in the Course

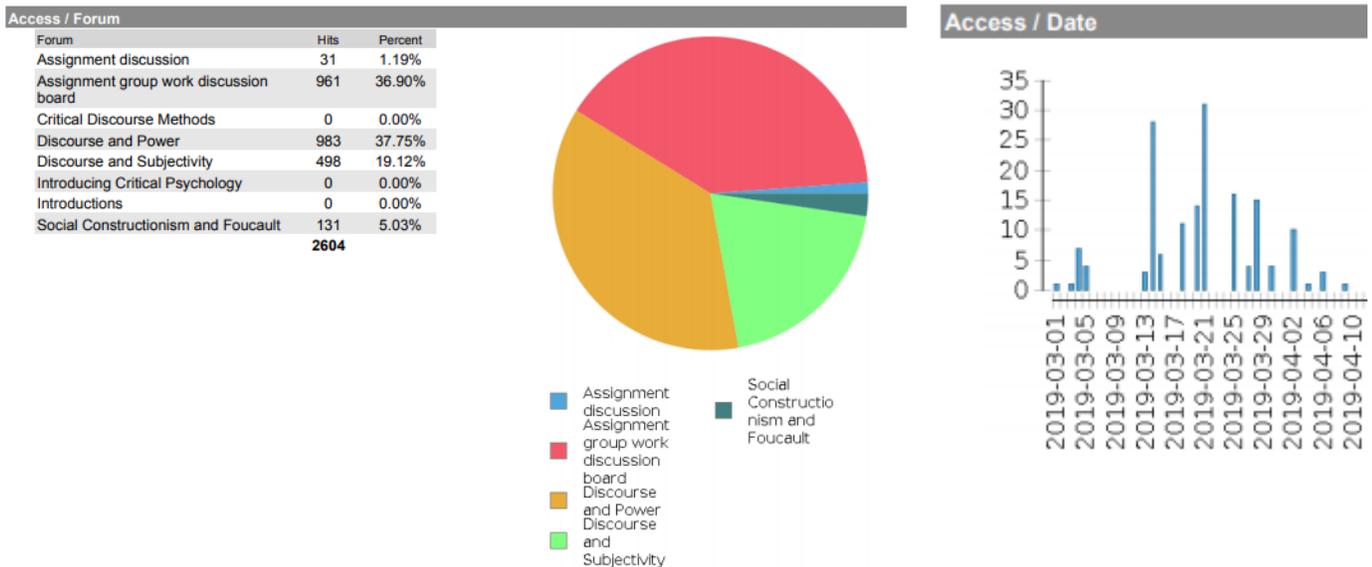
Item Name And Type	Total Time Spent in Hours	Number of Times Accessed	Initial Access Date/Time
Course Guide File	0.00	3	19 Mar 2019, 18:21
Formative Assessment Submission Content Folder	0.00	9	20 Mar 2019, 17:32
Formative assignment Turnitin Assignment	2.51	8	20 Mar 2019, 17:32
Lecture Week 6 Content Folder	0.00	1	24 Apr 2019, 10:38
Poster - due 8th April Turnitin Assignment	1.84	3	7 Apr 2019, 21:57

Figure 8 An example of the Student Overview for Single Course report

User Activity in Forums

This gives data on the usage of discussion forums of the cohort within the course, if any are used, in the following order:

- “Access/Forum” table and pie chart give number of clicks in each of the messaging areas.
- “Messages/Forum” table and pie chart give number of posts in each messaging area.
- A table showing the number of clicks by each student within the discussion forum.
- “Access/Date” bar chart gives number of clicks each week which is good for a visual guide to noticing times of high and low activity.
- Tables showing the number of hits per day since start of report.



User Activity in Groups

This report is the same as User Activity in Forums, except that the data is about groups and not discussion forums.

Performance Dashboard

The Performance Dashboard shows a list of all students in the course. Clicking the icon on the ‘View Marks’ column for a student gives their marks for each piece of work in the course, giving a total and weighted total.

Retention Centre

The Retention Centre is a simple way to be quickly informed if a student is having certain difficulties. The main page shows students that are currently failing to meet the ‘rules’ that staff can set in the ‘Customise’ tab at the top right of the page. Four types of rules are available that will flag students that:

- Have a course activity level that is X% below the average
- Last accessed the course greater than X days ago
- Have a mark that is X% lower than average
- Have missed X deadlines by more than Y days

The X and Y for each can be chosen and edited. Staff can click on each student that meets these criteria to see which area they fall behind on. In response, they can press the ‘Monitor’ button under the student’s name to track that particular student and/or press the ‘Notify’ button to email the student and/or their personal tutor.

Students currently at risk

STUDENT ▲	MISSED DEADLINES	MARKS ALERT	ACTIVITY ALERT	ACCESS ALERT
			●	●
			●	●
			●	●
			●	●
			●	●
			●	●
			●	●

Figure 10.1 The Retention Centre, showing students that are ‘at risk’ by not meeting the set criteria. Student names covered.

Profile Picture AT RISK Monitor Notify

Risk Factors

MISSED DEADLINES	MARKS ALERT	ACTIVITY ALERT	ACCESS ALERT
None	Total Mark: % No mark activity yet.	No Activity In Course 20% below course average in the last 1 Week(s)(s)	42 days ago Last access more than 5 day(s) ago

show all rows

Figure 10.2 Looking at an individual student in the Retention Centre. Note the ‘Monitor’ and ‘Notify’ buttons.

Other Learn Analytics

- ‘Achievements’ can be set in courses that will show a badge to students when they have completed tasks to a certain level or reached milestones. Instructors can then view how many and which students have got the achievements, so it is a good way to track the performance of students. The Achievements tool can be found on the Course Tools panel on the left side of Learn.

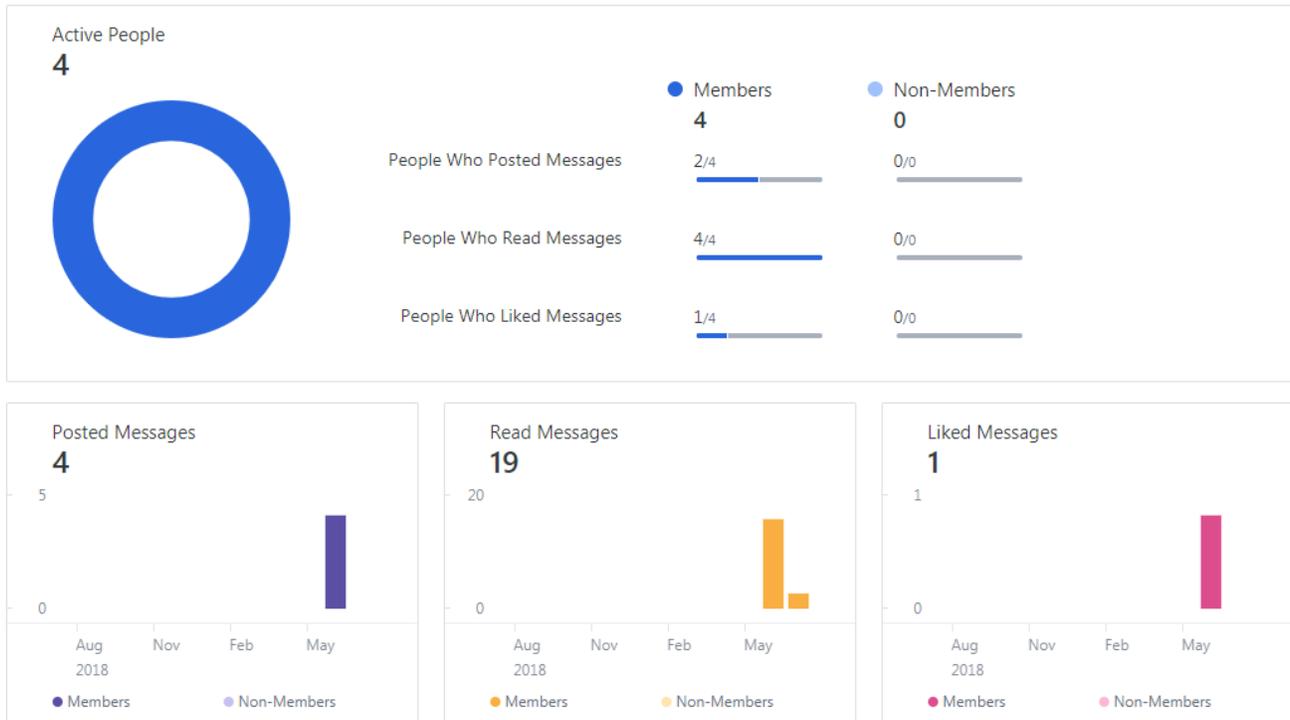


Figure 12 The main Yammer analytics, showing number of posts, read messages, active members and liked messages

PhD Supervisions

EUCLID is used for tracking engagement, particularly for postgraduates. However, PhD supervisors sometimes record meetings in the minutes/notes section on EUCLID instead of the official meeting recording section. This is bad for tracking engagement as the data isn't fed into the meeting recording system from the minutes/notes section. Another issue is that EUCLID only shows meetings from the past 90 days which alters the engagement statistics for students who are studying for a long period of time, as you can't review their engagement across their studies.

Areas without Analytics

Some areas staff use unfortunately don't have analytics available, even though it would be useful.

Turnitin

Staff are interested in knowing how much effort they should put into giving feedback to students; if only 5% of the cohort read the feedback, then should they spend time writing feedback for everyone? It is also possible to give audio feedback for Turnitin, so staff have to choose which format to use. However, for both audio and written feedback there is currently no way of checking whether a student has actually read/ listened to the feedback or simply checked their mark and left the page, because Turnitin do not collect this data.

BI Suite

BI Suite is not a main tool to be used by teaching staff for analytics, but it is used during the admissions process by support staff to track the engagement of prospective students. However, it is a time consuming and difficult task because BI Suite does not track dates of updates to the system, so the lists have to be manually checked for any updates. The lack of this data means analytics cannot be done.

Predictive Analytics

Predictive analytics are not available at the university currently, but this area may be useful in the future. For example, it could be used to highlight students at the most risk of dropping out or having difficulties, which could be useful for support staff that currently find they are being informed of students' problems too late. Of course, this system would not pick up all problems and may highlight students that never have difficulties during their studies, but it may help flag students at risk sooner.

Support for Staff

Note that there is a self-enrol course on Learn called Course and Student Performance which gives a brief look at some of the tools in Learn that will be mentioned in this document, so for a visual guide it may be useful to look there, or ask the learning technologist in your school. If you currently don't know much about learning analytics, this guide, the accompanying leaflet and your colleagues can help.

Recommendations

As a summary of the points raised in this guide, these are the key recommendations to the School going forward:

- **Share best practice:** There are interesting and easy to implement learning analytics being done by staff around the school and college, so it would be beneficial to all if these could be shared with staff at future TEL meetings or Learning and Teaching meetings, for example.
- **Clearly define who is responsible for learning analytics:** In order to meet the school's TEL strategy of using learning analytics, it needs to be decided which groups of staff are responsible for analytics and what kind of analytics is expected of them, otherwise it will continue to not be widely used.
- **Include analytics in programme and course reports:** Since programme teams can change frequently, it may be useful to have data and analytics on hand about previous years to pass onto the new director so that the course can be compared to previous years.
- **Ensure Statistics Tracking is turned ON:** Staff must manually turn on the statistics tracking for items on their Learn course, otherwise no data will be collected.

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- **Remind Staff of the 180-day time limit to get data:** If staff were sent emails a week or day before the 180th day after the start of the semester, it would allow them to get any analytics they want before the data becomes unavailable in Learn. This could be done by the learning technologist.
 - **Investigate extending the 180-day time limit:** This would allow analytics to be carried out over a longer time frame.
 - **Encourage Staff to try the analytics:** It will likely be simpler and more useful than expected and will be insightful, but staff will only know if they try it.
 - **Explain to Supervisors why they should record meetings properly:** Supervisors know how they should be recording their meetings with students, but many don't for a variety of reasons. In order to track engagement properly, it is vital that meetings are recorded in the correct way.
 - **Designate a member of staff for learning analytics support:** If staff know who to go to for support, they may be more likely to try it.