

# Learning Analytics to Improve Student Outcomes

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Chair, Jisc



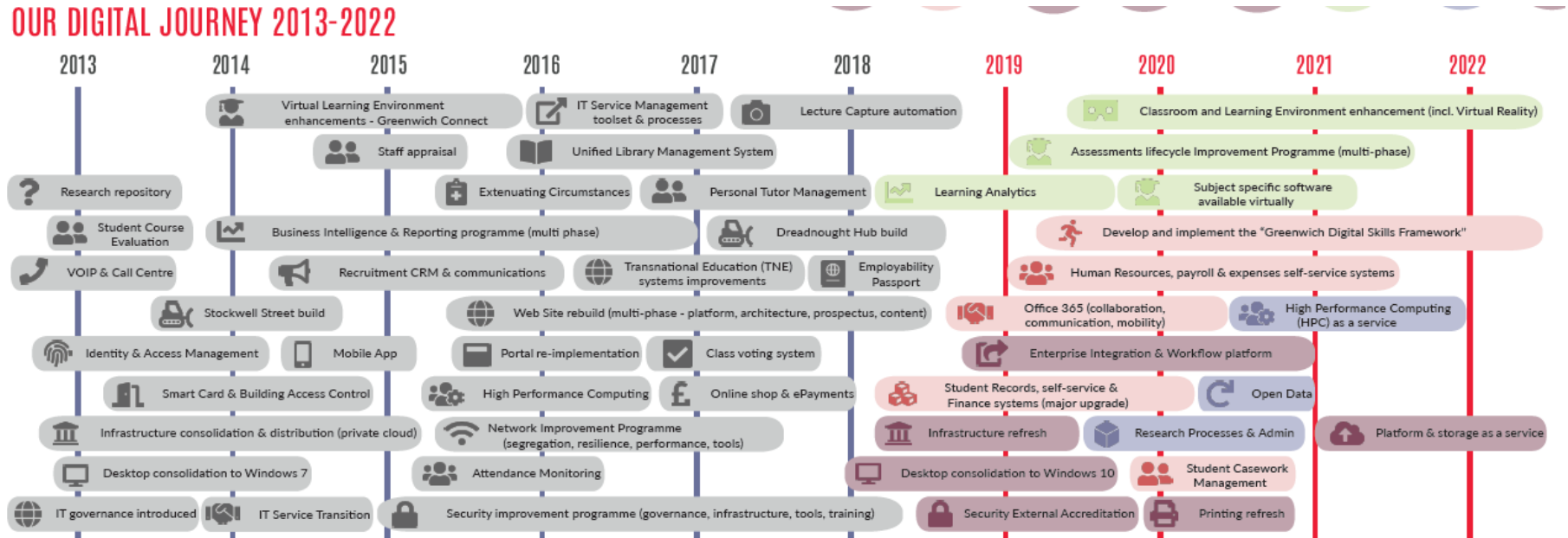
# University of Greenwich

- Public, research university in Greenwich and Medway, Kent
- Specialise in professional, technical and vocational subjects
  - Arts, humanities and social sciences
  - Business
  - Education and Health
  - Engineering and Science
- Strong track record of widening access
- 21,000 students in UK; plus 17,000 TNE students



# Greenwich Digital

## OUR DIGITAL JOURNEY 2013-2022



- Student records
- Virtual Learning Environment
- Attendance Monitoring
- Library Management
- Plagiarism detection
- Learning Analytics
- Timetabling
- Lecture Capture
- Personal Tutor Management System

# Learning Analytics

- Use of data and algorithms to improve student outcomes by changing student and staff behaviour
  - Data Science
  - Artificial Intelligence
  - Behavioural Insights
- Term introduced by Mitchell and Costello in 2000, used in Blackboard LMS in 2005
- Wide range of student uses
  - Engagement
  - Retention & Progression
  - Mental health and well-being
  - Module Selection
  - Overall Outcomes



# Greenwich Personal Tutor Management System

Integrates key student data

- Demographics

- Personal details (name, contact information, gender, ethnicity, disability information etc.)
- Programme and course details
- Personal statement
- Transcript

- Activity:

- VLE
- Library
- Attendance
- SRS

- Tutor comments

The screenshot shows the main interface of the Greenwich Personal Tutor Management System. It features a top navigation bar with buttons for 'Create Meeting', 'View/Edit Meeting', 'Comments', 'Email Selected', and 'Activity Data'. Below this is a filtering menu with dropdown menus for 'Program', 'Mode', 'Year', 'Start Month', 'Stage', 'Status', 'Type', and 'Dept', along with 'Submit Filters' and 'Clear Filters' buttons. The main content area displays a table of tutees with columns for 'Select', 'Image', 'ID', 'Surname', 'Forename', 'Program', 'Program Title', 'Mode', 'Year', 'Start Month', 'Stage', 'Reg Stat', 'Student Type', 'Department', 'Site', 'Holds', and 'Email'. Below the table, a summary bar indicates 'Total number of Tutees: 3'. At the bottom, there is another set of navigation buttons identical to the top bar. Annotations with arrows point to various parts of the interface: 'Main Menu.' points to the top bar; 'Filtering Menu.' points to the dropdown menus; 'List of tutees showing summary details and programme information.' points to the table; 'Count indicating the number of Tutees' points to the summary bar; and 'Menu Items repeated after the tutee list.' points to the bottom bar.

Select	Image	ID	Surname	Forename	Program	Program Title	Mode	Year	Start Month	Stage	Reg Stat	Student Type	Department	Site	Holds	Email
<input type="checkbox"/>					P11888	NPHARM (PHARMACY) M01	4	EPSEP	4	EL	C	MPH	Univ of Greenwich at Medway			<a href="#">[Email]</a>
<input type="checkbox"/>					P11888	NPHARM (PHARMACY) M01	4	EPSEP	4	EL	C	MPH	Univ of Greenwich at Medway			<a href="#">[Email]</a>
<input type="checkbox"/>					P11888	NPHARM (PHARMACY) M01	4	EPSEP	4	EL	C	MPH	Univ of Greenwich at Medway			<a href="#">[Email]</a>

# Jisc LA System Architecture

Presentation and Action



HEI Dashboards



Data Explorer



Student App: Study Goal

Data Storage and Analysis



Jisc Learning Analytics Predictor



Learning Data Hub



Data Aggregator

Data Collection

Transformation Toolkit/Plugins



Student Records



Other Data



VLE



Library

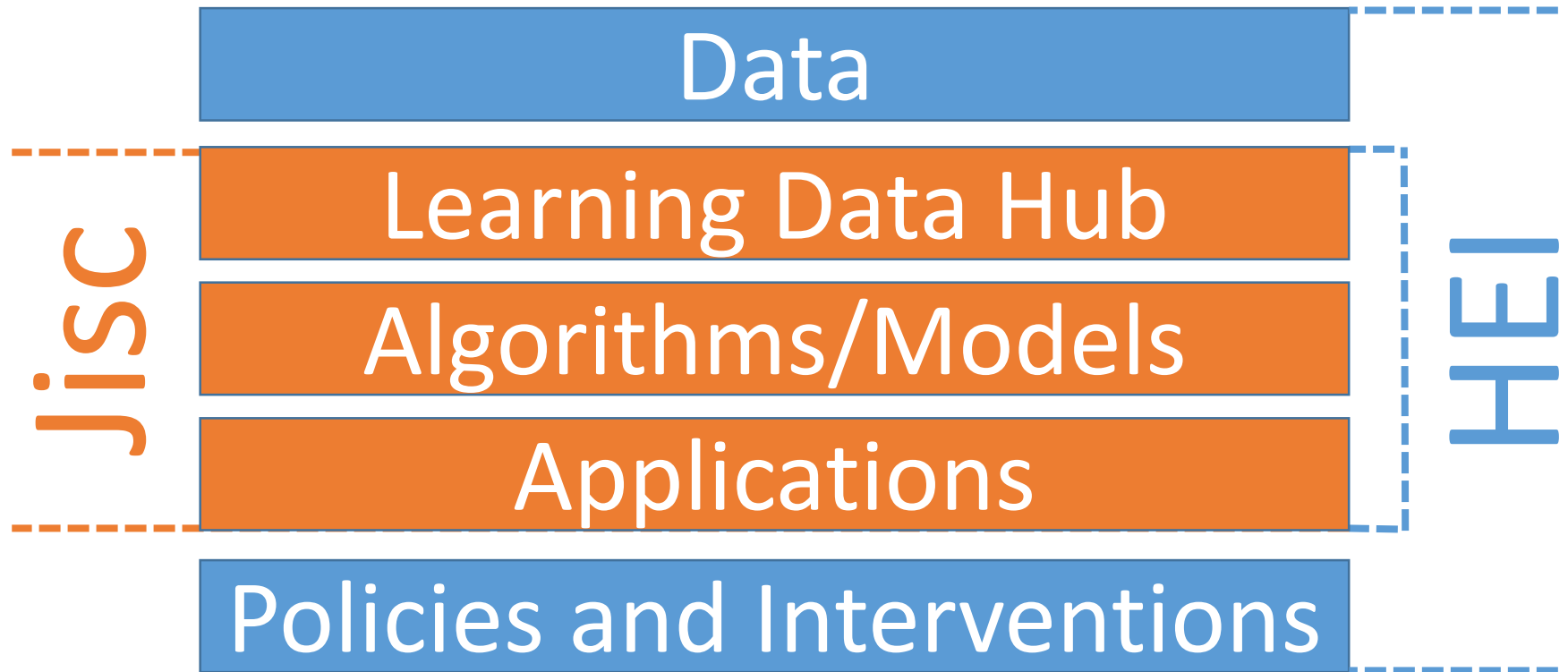


Attendance



Equipment Use

# Jisc National Learning Analytics System





**CHANGE  
STARTS  
HERE**

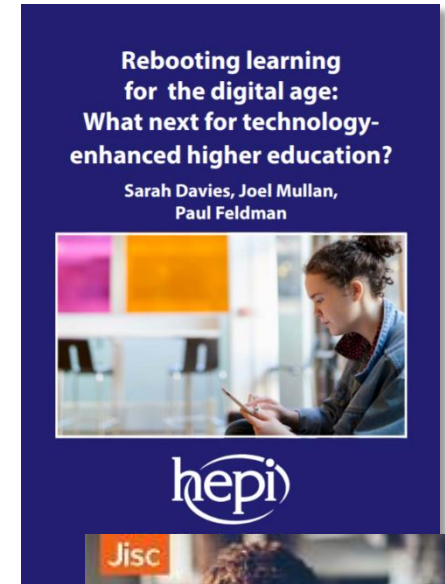
[d.maguire@gre.ac.uk](mailto:d.maguire@gre.ac.uk)

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# Example LA Projects

- Columbus State University College (USA): retention rose by 4.2% (5.7% for low-income students)
- Open University (UK) pilots: 2.1% boost in retention
- University of New England (Australia): drop-out rates fell from 18% to 12%
- Purdue University (USA): 12% more B and Cs, 14% fewer D and Fs using LA system



# Improving Retention with LA

- Monitor attendance
- Intervene based on data insights
  - Compare student engagement/performance with cohort and tutor/lecturer expectations
  - Predict student outcomes
- Motivate students
  - Review performance
  - Set goals

The screenshot shows the 'My Dashboard' for the University of Greenwich, accessed via Jisc Data Explorer - Pioneer Edition. The dashboard is divided into several functional tiles:

- Tutor Search:** Find a tutor directly within your institution by forename, surname or tutor ID. Includes a link to 'View all tutors >'. Icon: Person with magnifying glass.
- Course Search:** Discover courses within your institution by course name or start / end date. Status: 'Coming soon'. Icon: Graduation cap.
- Module Search:** Locate a module within your institution directly by module name or module ID. Includes a link to 'View all modules >'. Icon: Book.
- Student Search:** Locate a student within your institution directly by forename, surname, student number and status. Includes a link to 'View all students >'. Icon: Two people.
- Department and Course view:** View students at risk (RAG indicator) by Faculty, Department and Course. Includes a link to 'View Departments and Courses >'. Icon: Building.
- Help & Advice:** Jisc's expert support team are here to help you with any problem or question. Status: 'Coming soon'. Icon: Headset.

Navigation tabs at the top include 'Site Admin', 'Site Explorer', and 'Tutor'. The top right corner contains 'Logout' and 'Menu' options.

# Data

- Characteristics / prior learning
  - Student records (Banner)
- Engagement
  - Virtual Learning Environment/Learning Management System (Moodle)
  - Library access/usage (SirsiDynix)
  - Attendance Monitoring System
  - Personal Tutor Management System
- Assessment
  - Student records (Banner)
- Other



Student Records



Other Data



VLE



Library



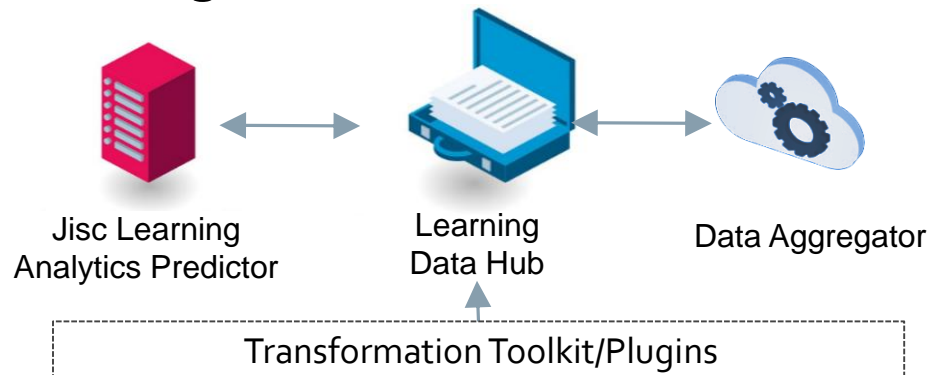
Attendance



Equipment Use

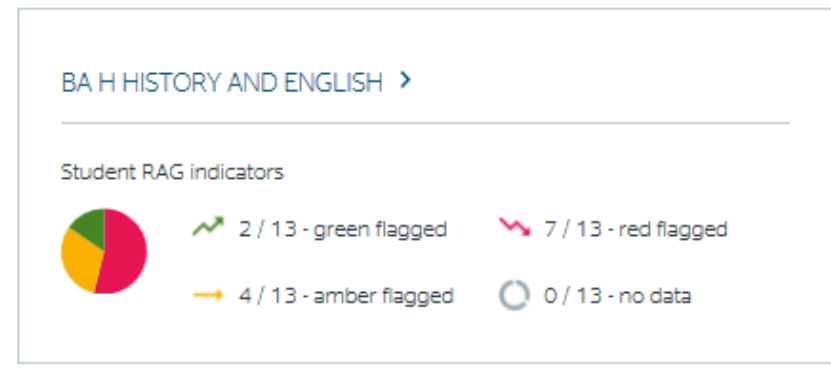
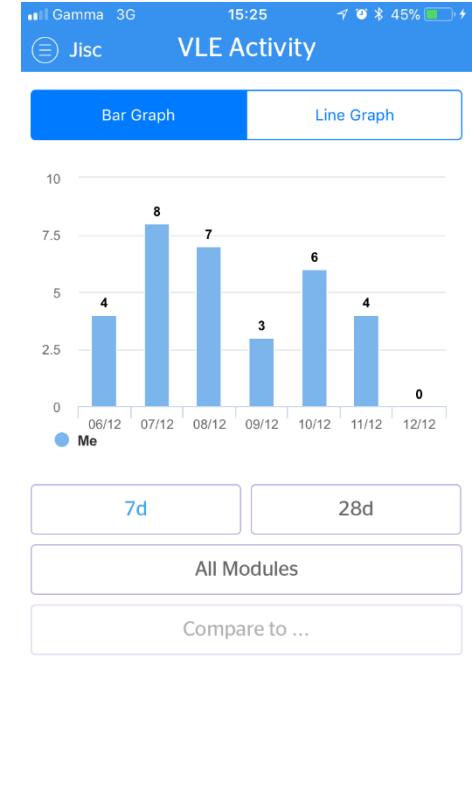
# Data Storage and Analysis

- Tools to read and transform data from most popular systems/formats
- Data aggregation tools
- Data stored in Learning Data Hub (database/warehouse)
- Algorithms and models
  - Rules-based
  - Prediction using machine learning



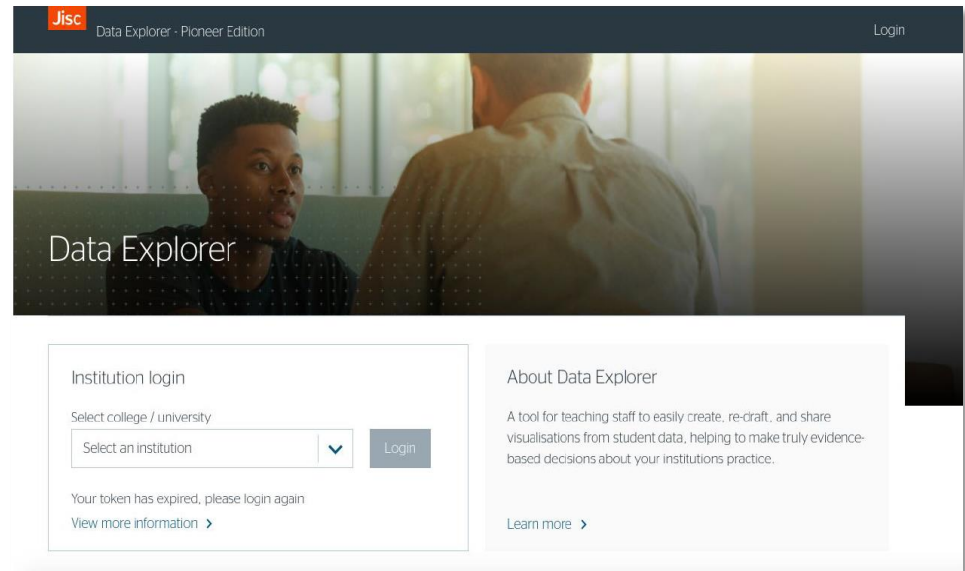
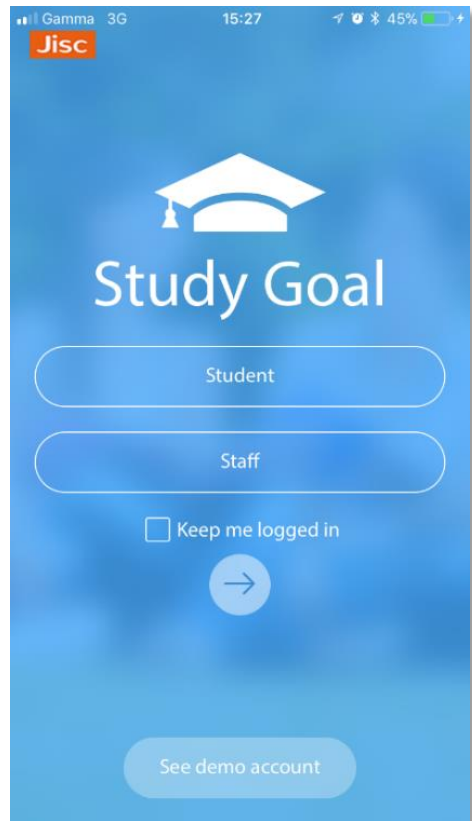
# LA-driven Interventions

- Review engagement and outcome data
  - Student
  - Tutor
  - Lecturer
- Series of nudge communications
  - Electronic (text, email)
  - Formal letter
- At Greenwich undertaken by Faculty Retention Officers



# Applications

- Student Study Goal
- Data Explorer



HEI Dashboards

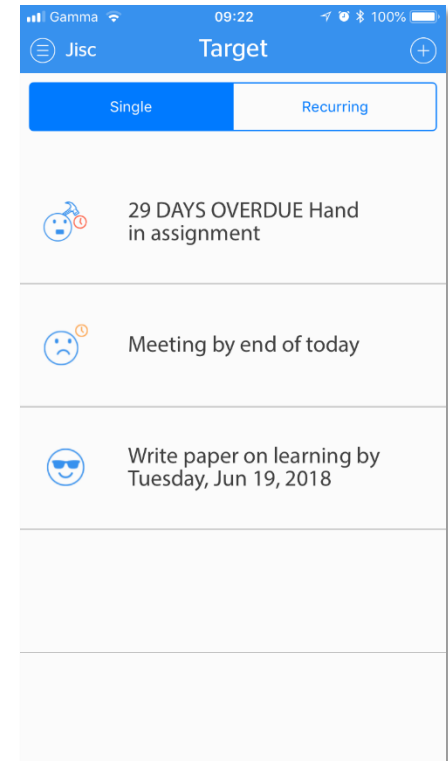
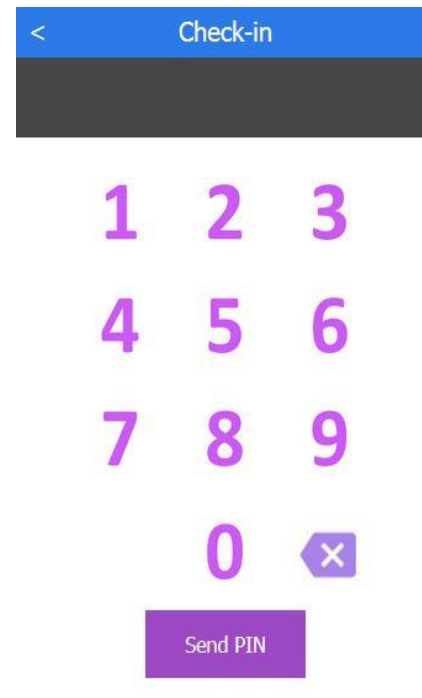
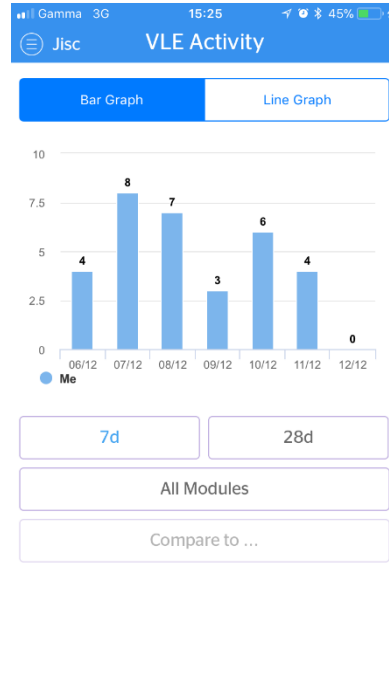
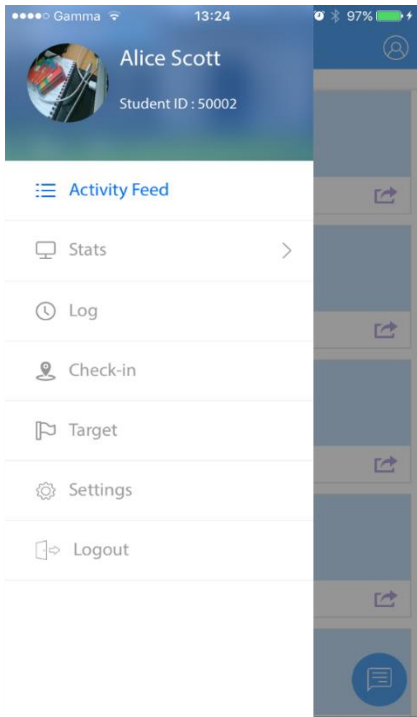


Data Explorer



Student App:  
Study Goal

# Study Goal



# Data Explorer

## Tutor Dashboard

Paul Bailey



### My Courses

Find data for the courses you manage via a course start / end date and academic year.

Coming soon



### My Modules

Manage and analyse current module data, start a new class lecture attendance and view previous registers

[View all modules I manage >](#)



### My Students

Locate students you manage directly by their name, red amber green (RAG) and alert status.

[View all students I manage >](#)

## Department and Course view

> Department  
Tech & Analytics

> Course  
Please select a course

> Student  
Please select a student

2 courses found

#### BA (Hons) Jiscing >

Student RAG indicators



12 / 18 - green flagged

0 / 18 - red flagged

2 / 18 - amber flagged

4 / 18 - no data

#### MA Jiscing >

Student RAG indicators



2 / 4 - green flagged

0 / 4 - red flagged

1 / 4 - amber flagged

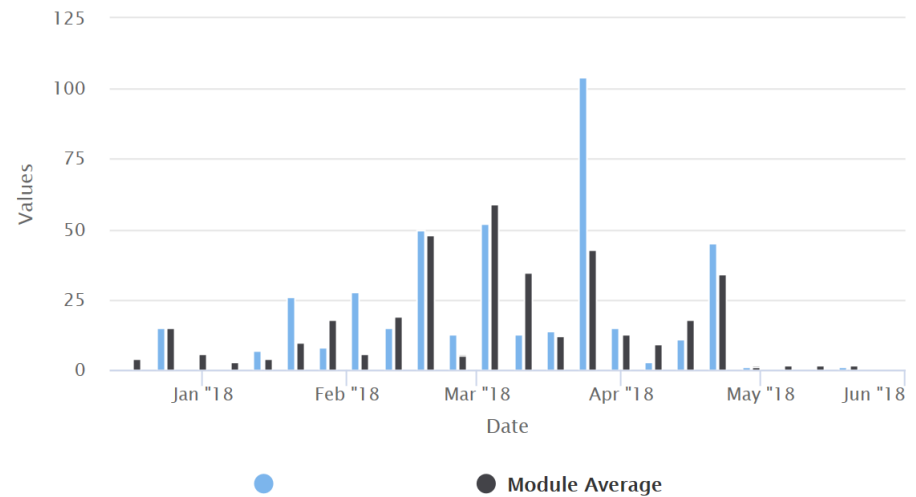
1 / 4 - no data



# Roles: Personal Tutor

- For the first time, all student information is easily accessible in one package
- Can talk to a tutee knowing everything about their studies
- Can show students how they compare against their cohort

Overall Activity (01/09/2017 – 31/05/2018)



Data type

Activity with Assessments

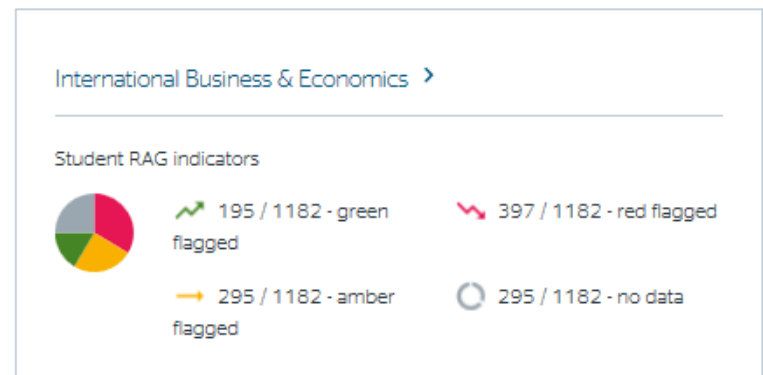
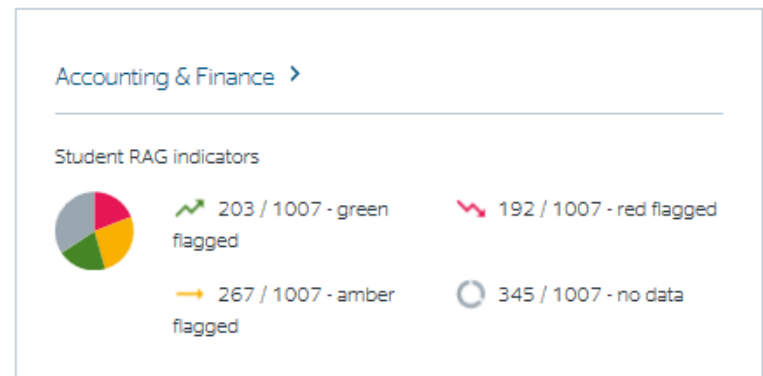
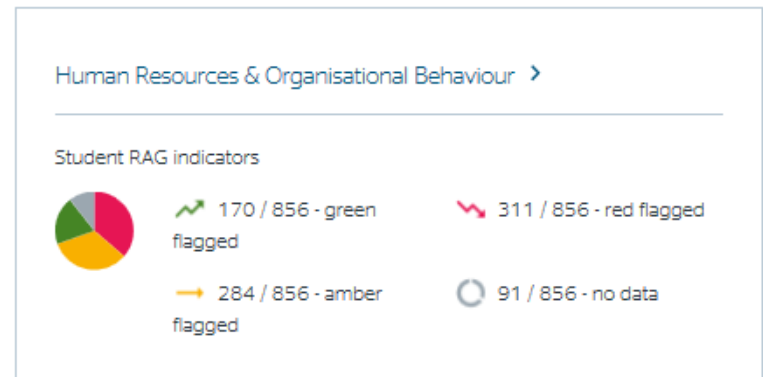


Explanation

This shows overall activity along with assessment. In this view, each tracked event counts as activity. This could be clicking/logging into a VLE, using Study Goal, or attending a lecture. Click the flags for information about the assignment.

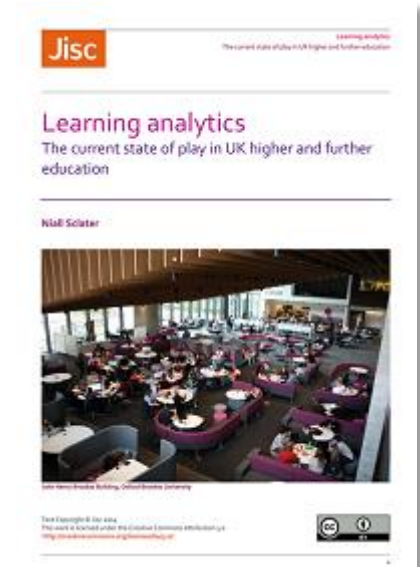
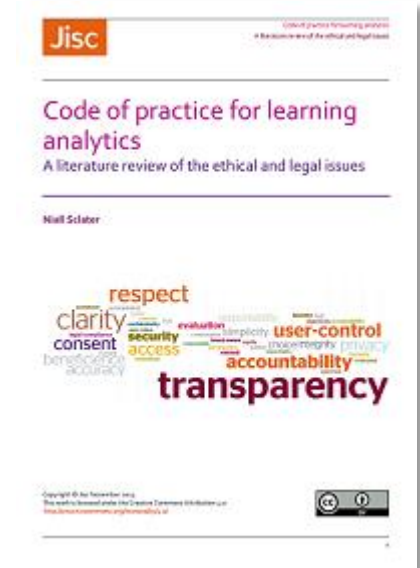
# Roles: Module (Course) Leader

- I can understand how students interact with my course and the online materials
- Indicates where I need to improve content, change course delivery, update Moodle, etc.

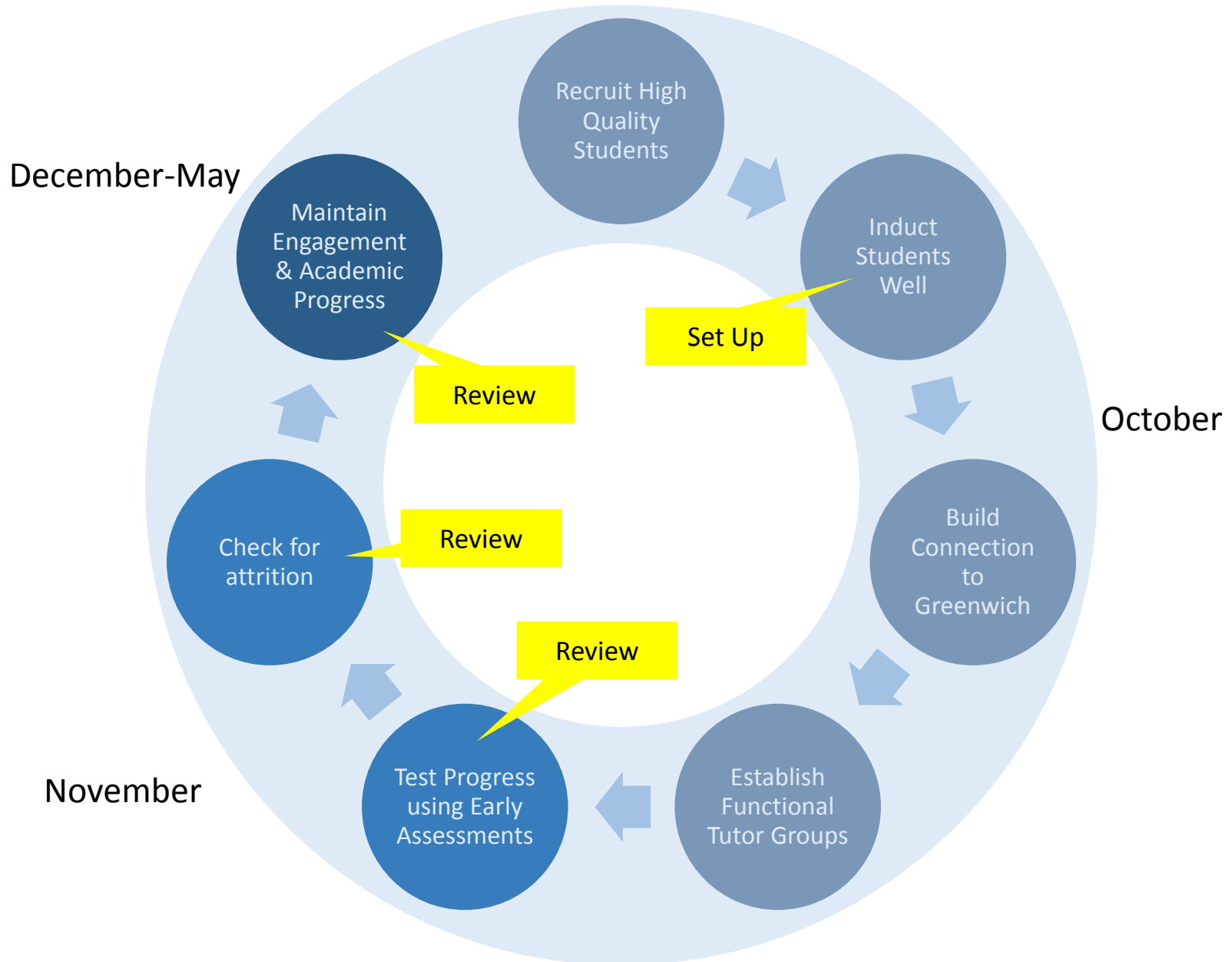


# Legal and Ethical Considerations

- Code of Practice
- Literature Review
- Template Learning Analytics Policy
- Guidance on consent for learning analytics
- Endorsed by NUS
- All available from the blog at <http://analytics.jiscinvolve.org>

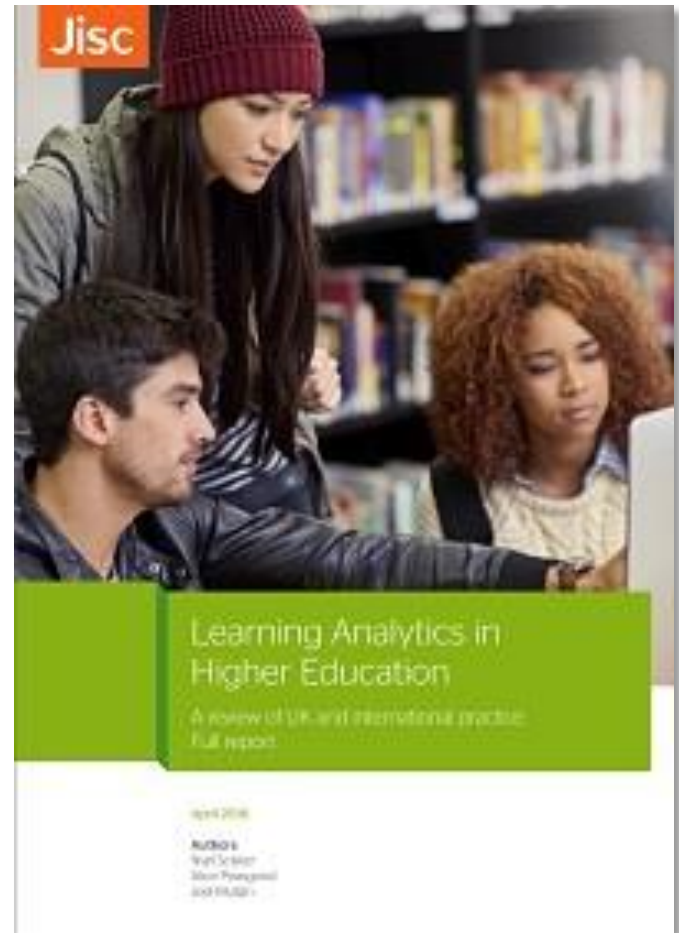


# Learning Analytics and Retention



# Jisc Learning Analytics

- Growing community
  - +100 unis and colleges
  - +20 vendors
- Heart is Learning Data Hub
  - Data from +25 organisations
- Expanding toolset
  - Load institutional data
  - Analytics processor
- Jisc Apps
  - Student App
  - Data Explorer
- Vendor apps and technologies
- Underpinned by business model, code of ethics, GDPR compliance, etc.





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