Learning analytics: implementing an institution wide strategy

JISC Networking Event 22nd June 2016

Kevin Mayles, Head of Analytics, The Open University

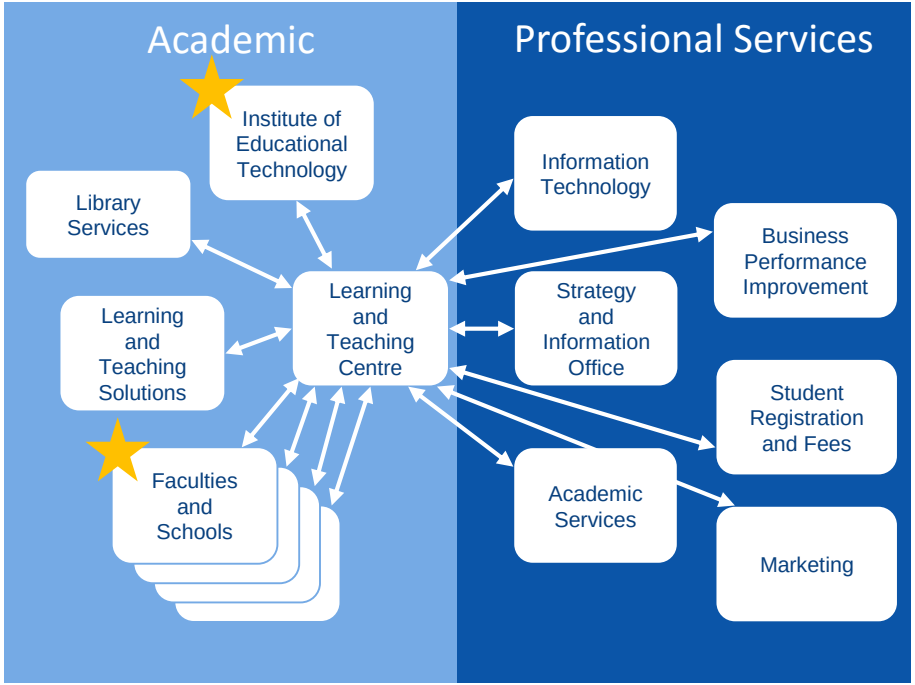
The Open University

Life-changing Learning

Learning Analytics @ The Open University

Where are you from?

- PVC Learning & Teaching
- CIO / IT
- Planning Office
- Student Support
- Faculty



The Learning and Teaching Centre

kevin.mayles@open.ac.uk | @kevinmayles

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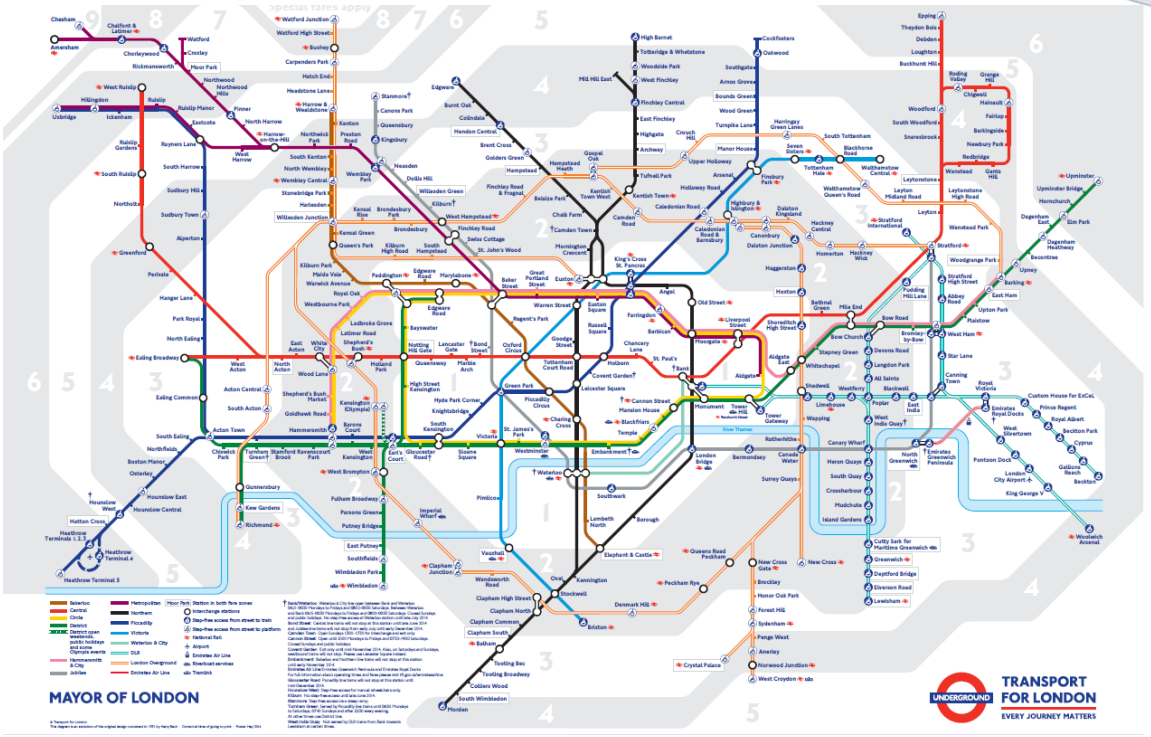

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OU Context

2014/15

174k students

The average age of our new undergraduate students is 29

40% new undergraduates have 1 A-Level or lower on entry

Over 21,000 OU students have disabilities

868k assessments submitted, 395k phone calls and 176k emails received from students

Analytics for student success vision

A clear vision statement was developed to galvanise effort across the institution on the focused use of analytics

Vision

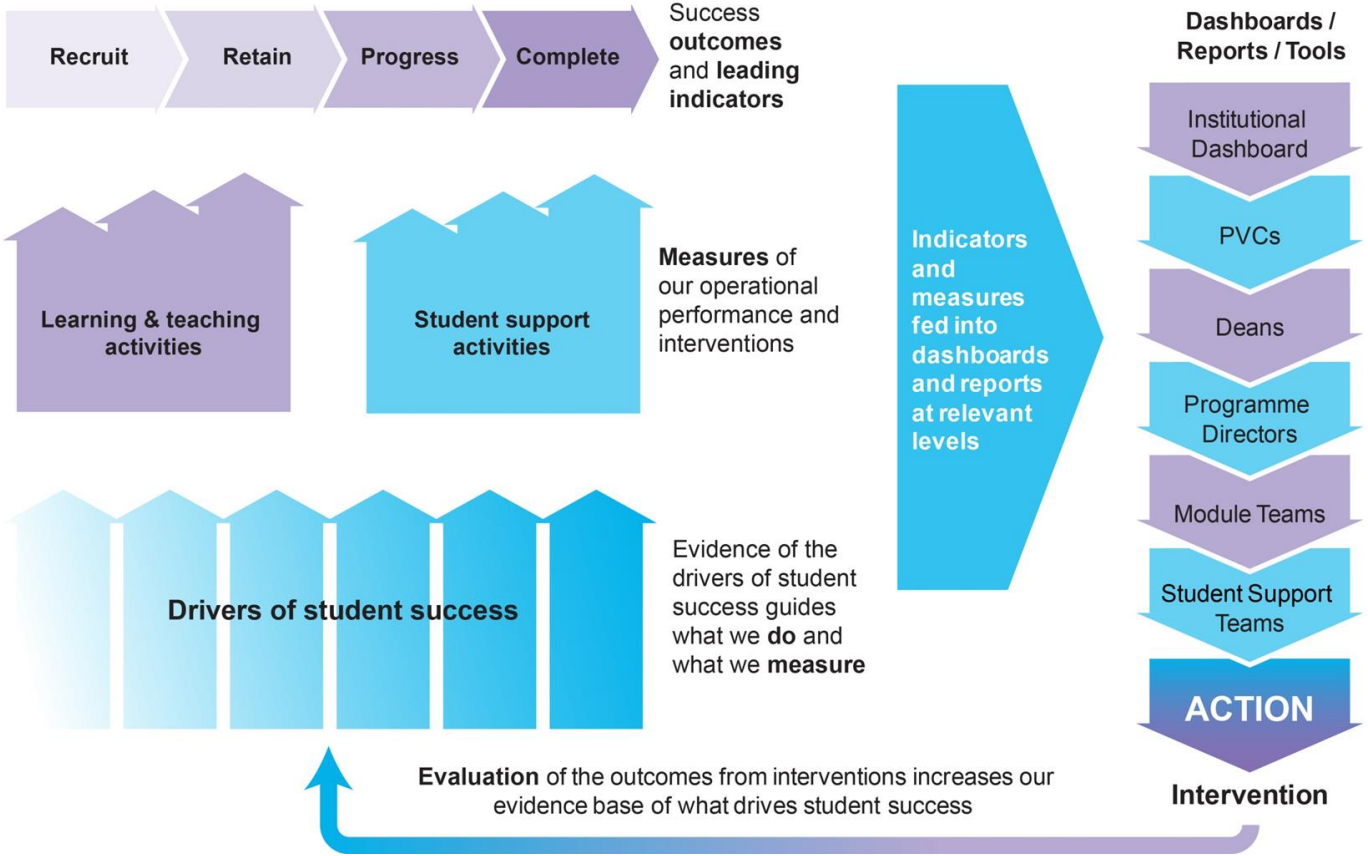
To use and apply information strategically (through specified indicators) to retain students and progress them to complete their study goals

Mission

This needs to be achieved at :

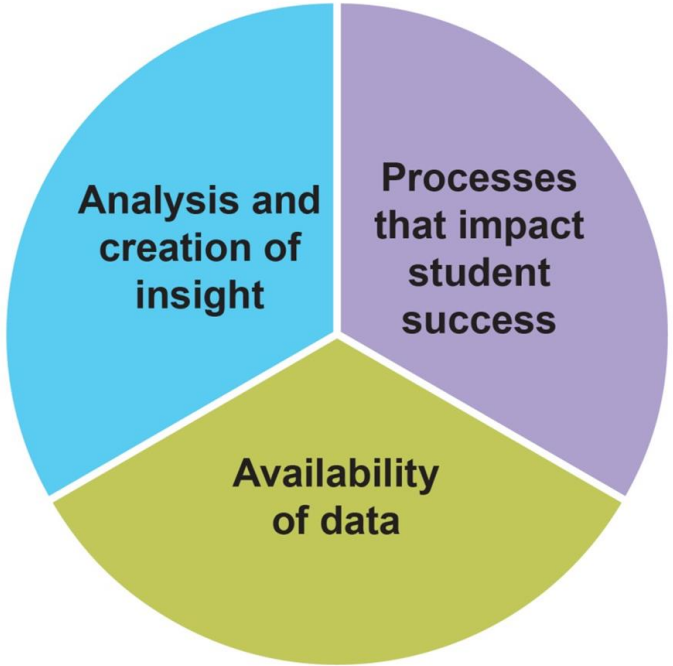
- a macro level to aggregate information about the student learning experience at an institutional level to inform strategic priorities that will improve student retention and progression
- a micro level to use analytics to drive short, medium and long-term interventions

Vision in action



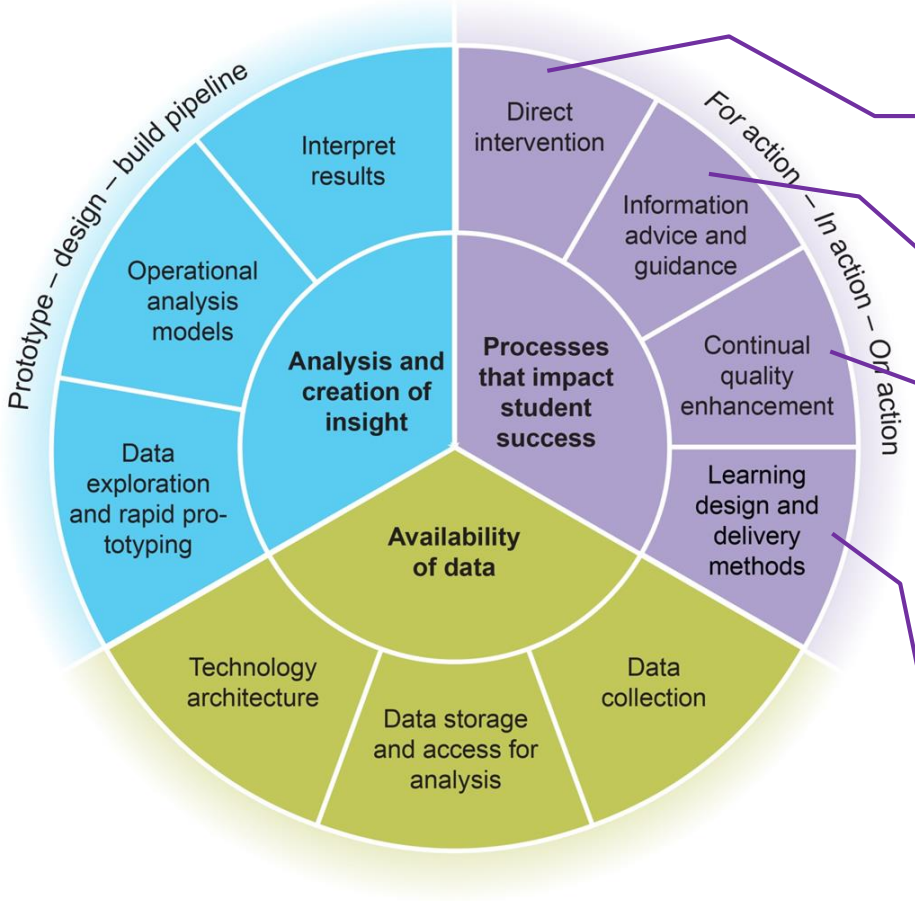
Analytics enhancement strategy

The OU recognises that three equally important strengths are required for the effective deployment of analytics



Adapted from Barton and Court (2012)

Analytics enhancement strategy



Early alert indicators using predictive analytics

Policy on the ethical use of student data for learning analytics

Analytics for action evaluation framework

Impact of learning design on outcomes

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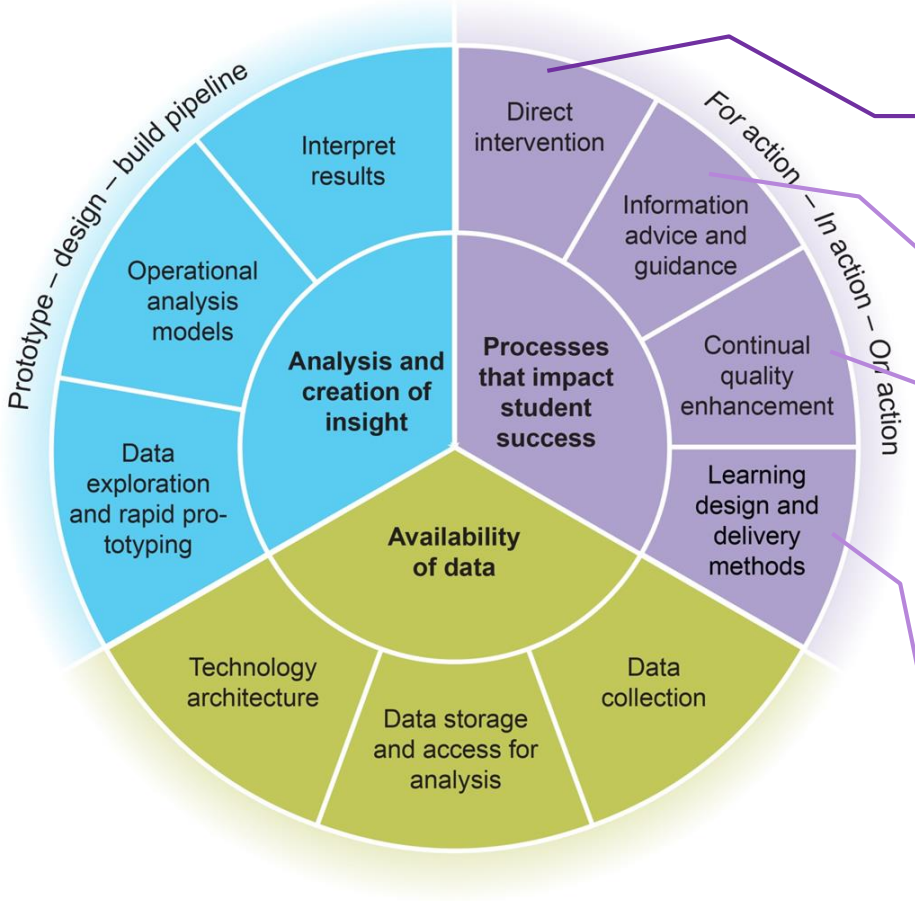
Analytics enhancement strategy



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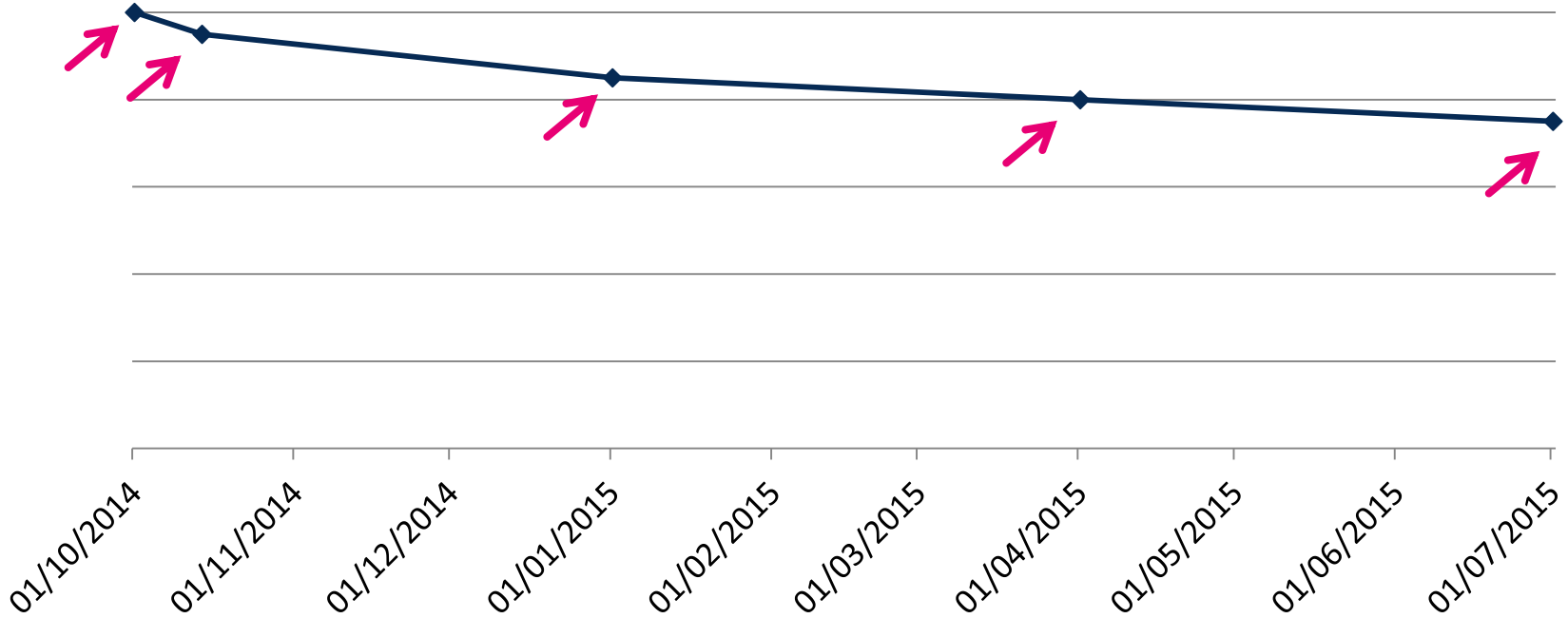
Development of early alert indicators

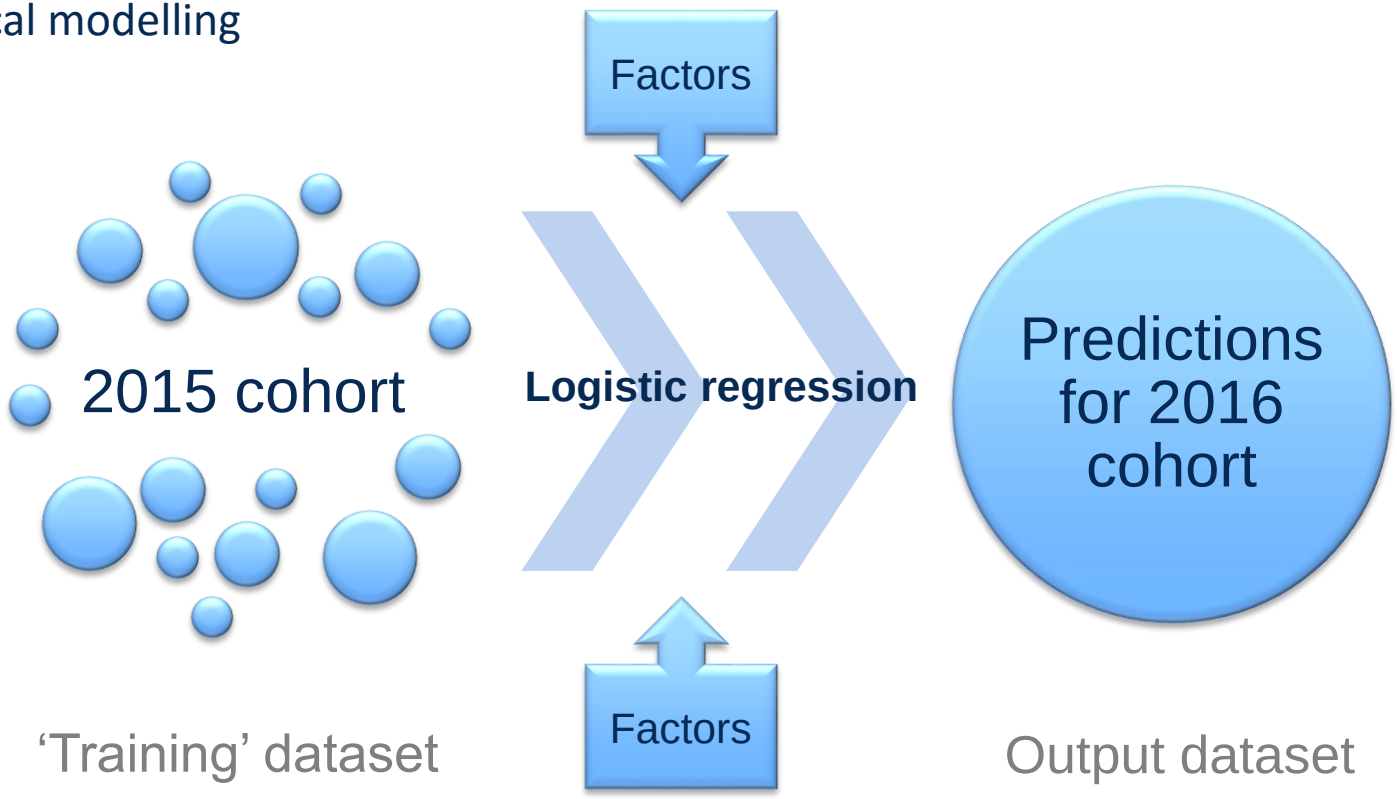
Application of a predictive analytics model to trigger interventions with vulnerable students



Calvert (2014)

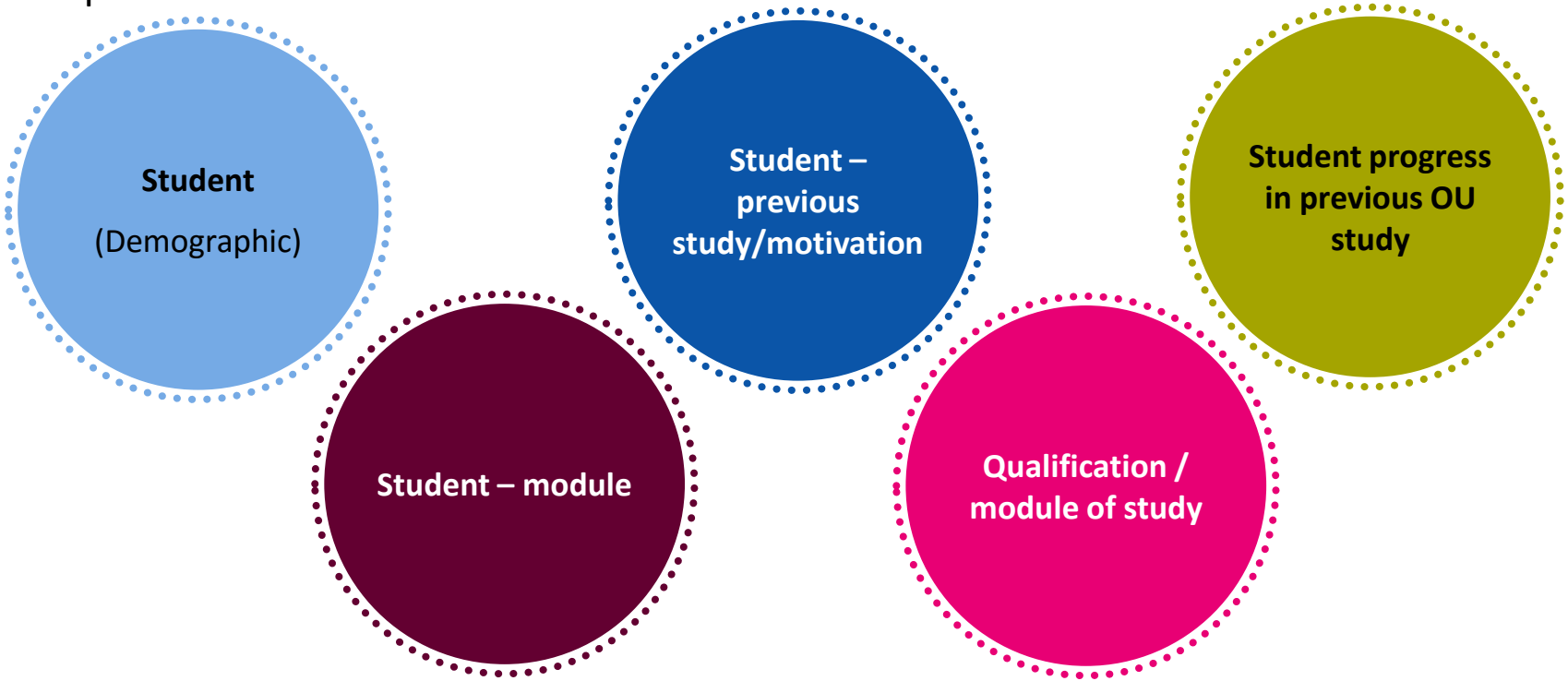
Development of early alert indicators

Statistical modelling



Development of early alert indicators

The 30 variables identified associated with success vary in their importance at each milestone



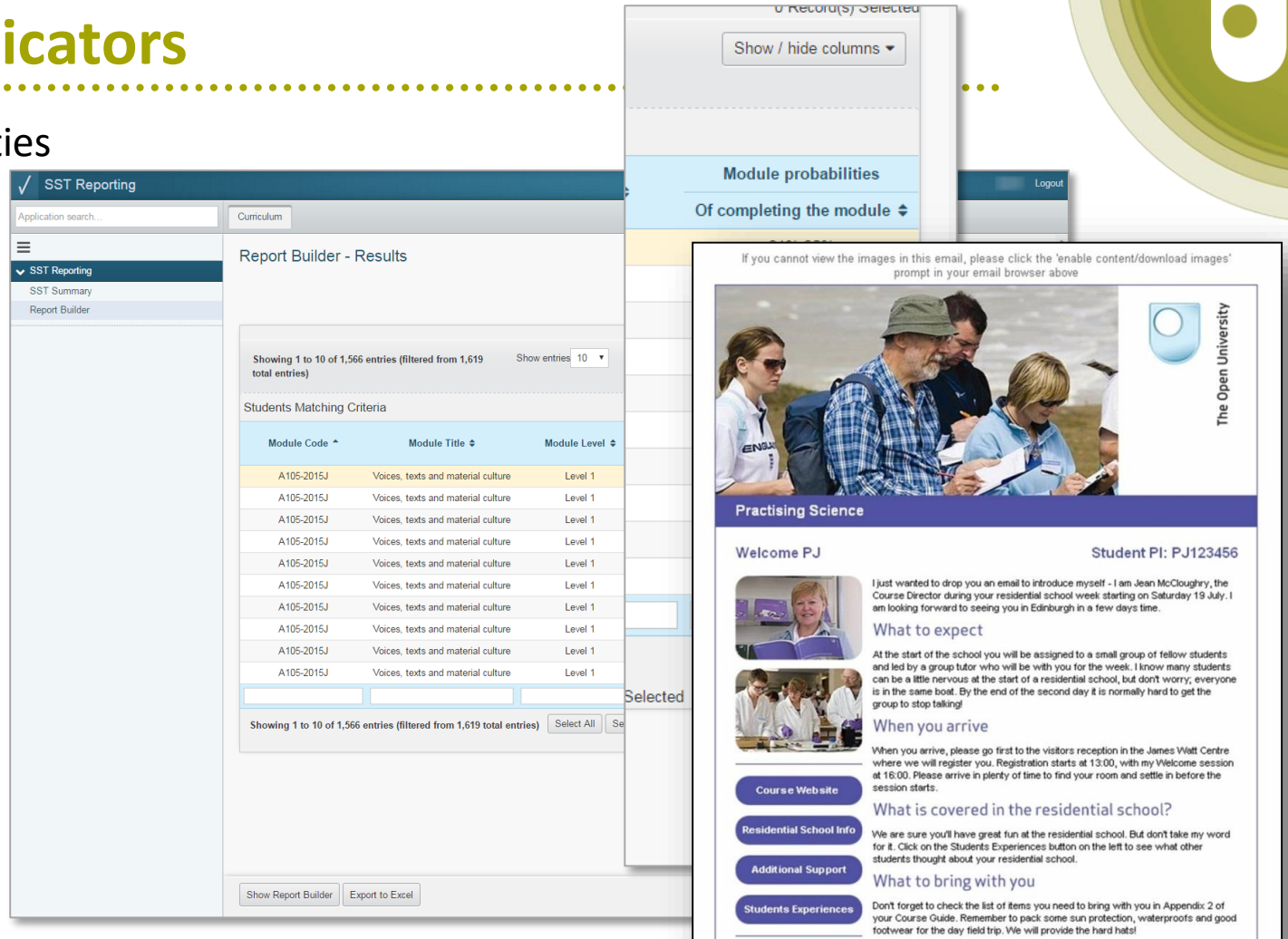
Calvert (2014)

Current indicators

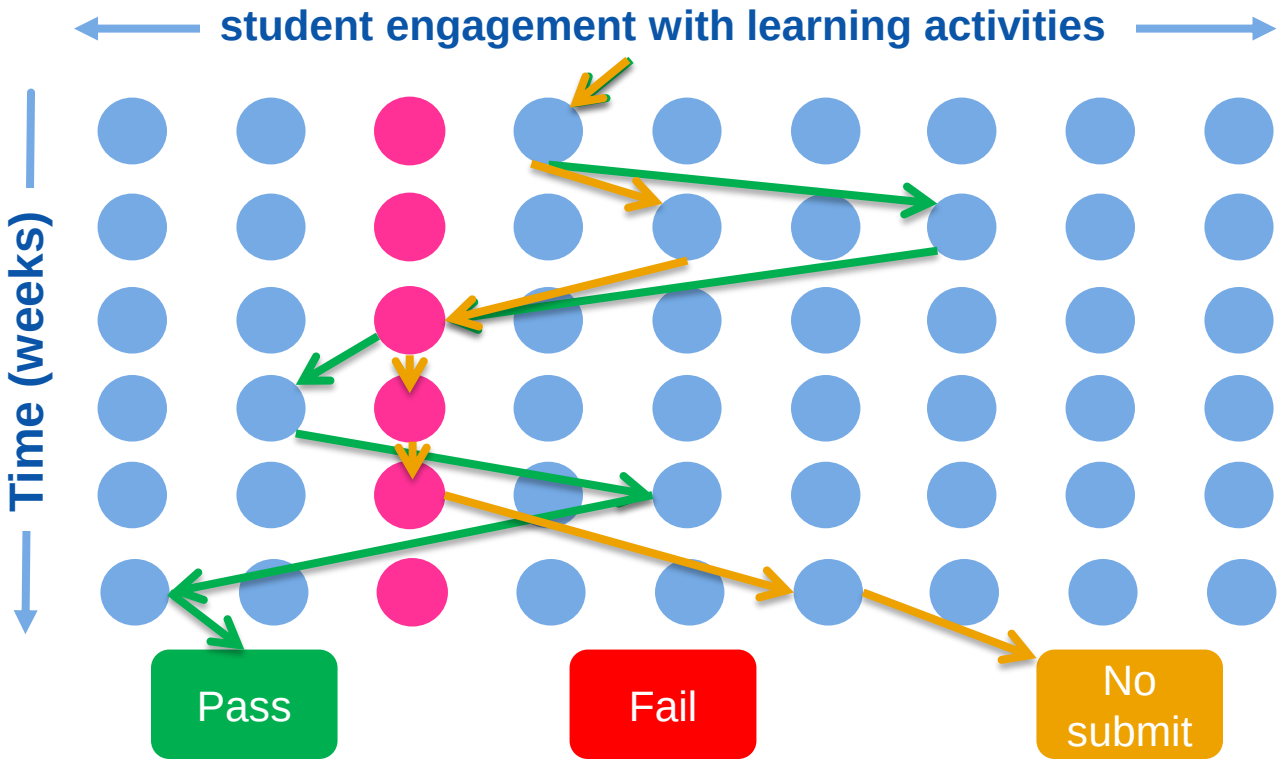
Module probabilities

Integrated into the Student Support Intervention Tool

Predicts the probability of a student completing and passing the module

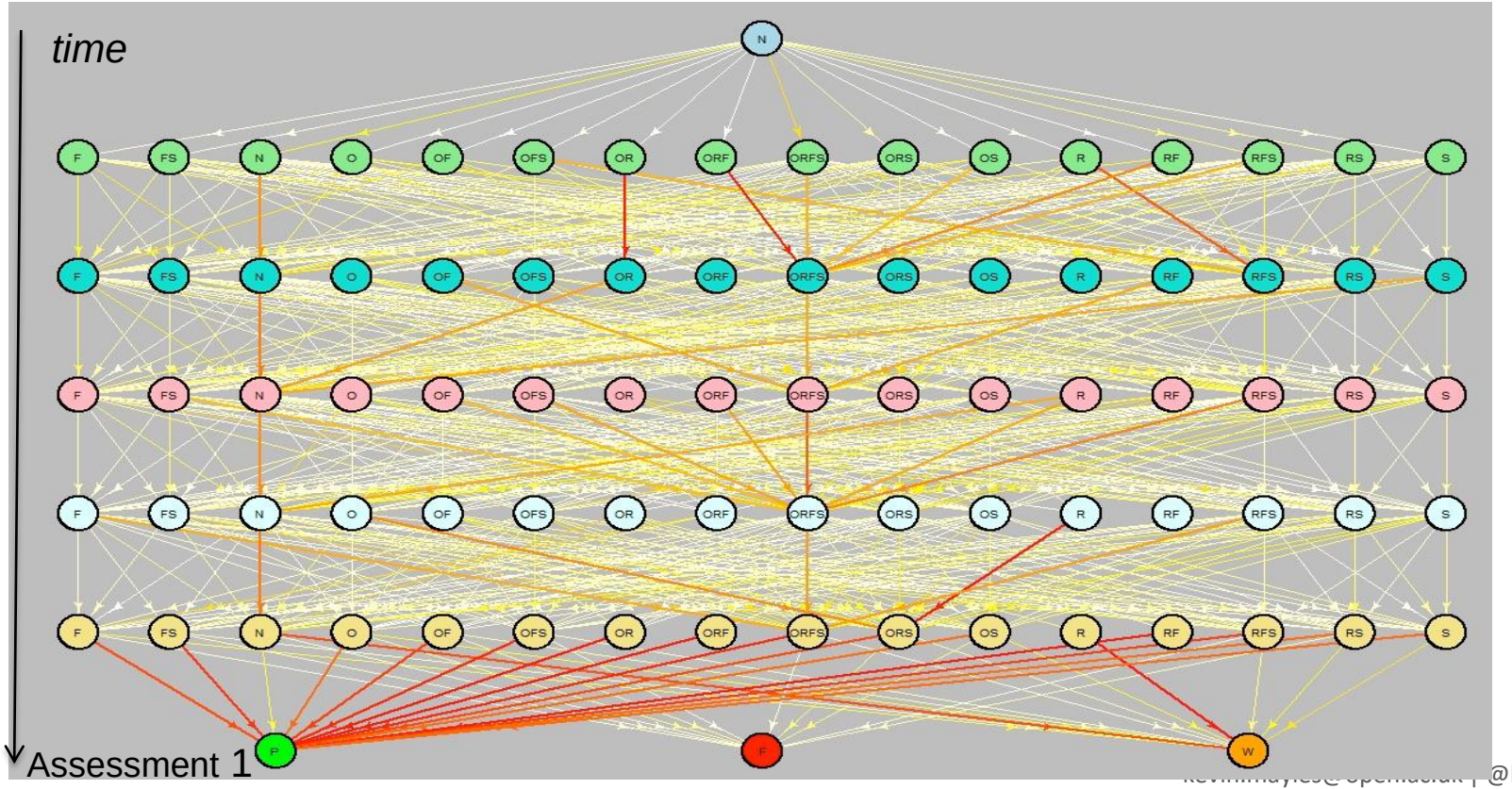


OU Analyse


student engagement with learning activities
Time (weeks)
Pass
Fail
No submit

OU Analyse

Module fingerprint

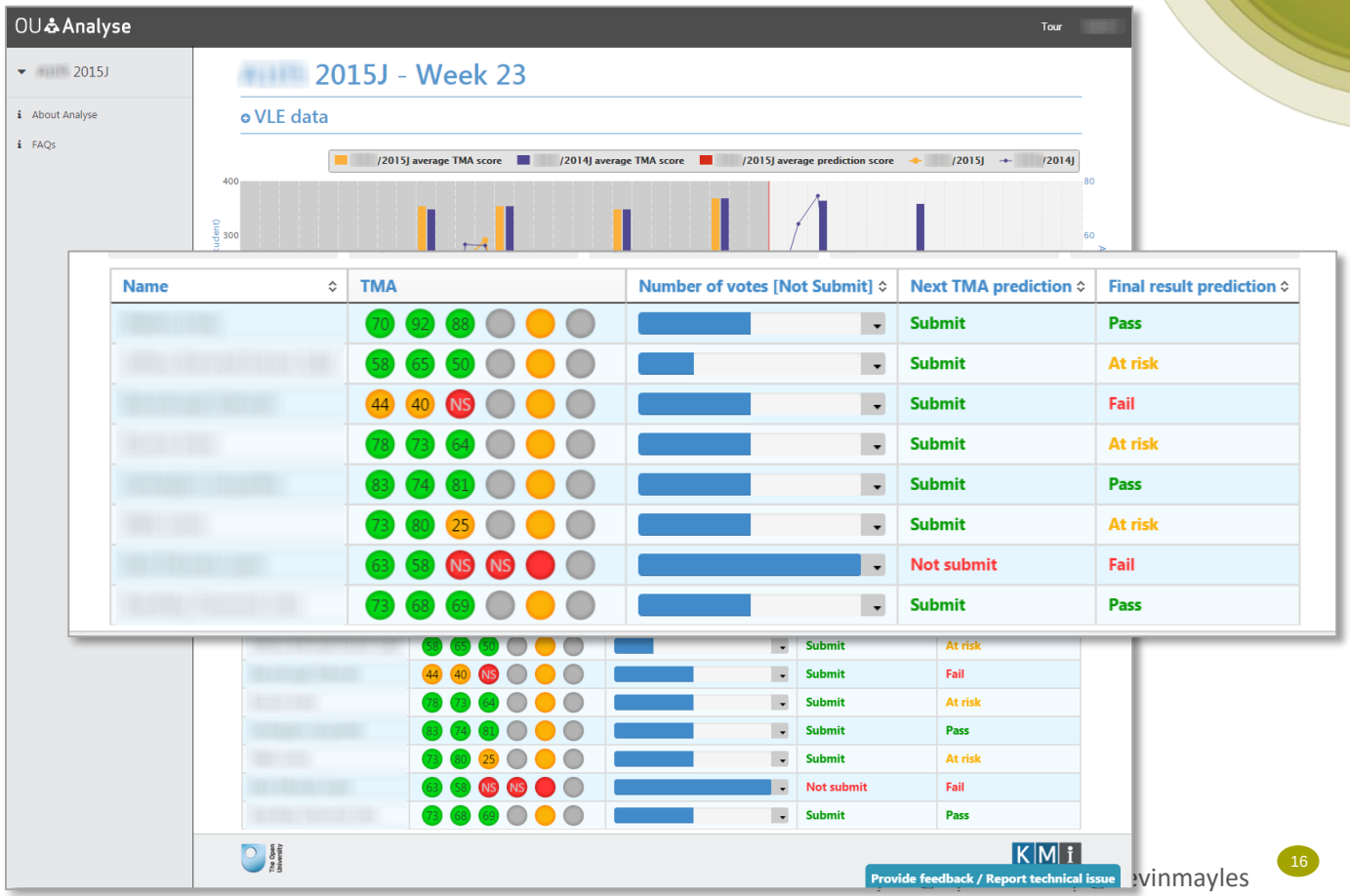


Current indicators

OU Analyse

Predicts the submission of next assignment weekly

Deployed through OU Analyse Dashboard



Outcomes of current pilots

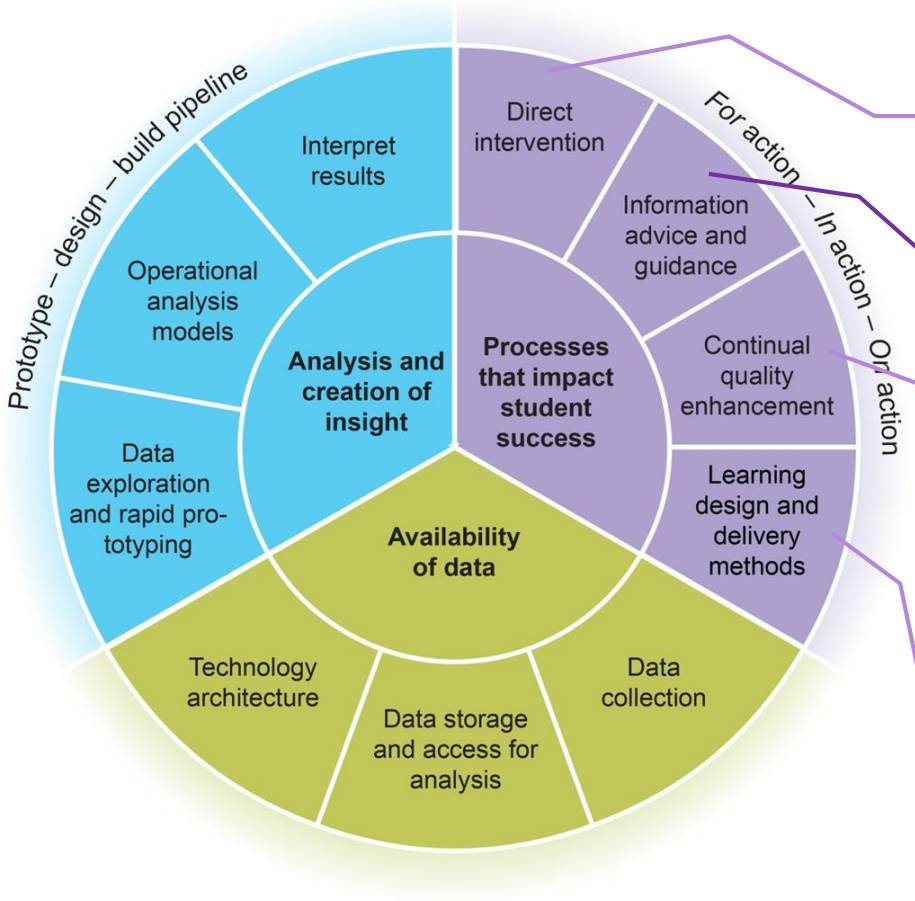
Summary of the interim evaluation of piloting as at March 2016

- There is a mixed picture in the quantitative analysis on the impact in the pilot tutor groups on withdrawal rates and assignment submissions (note that tutors are self selected and the expectations to intervene are not consistent across the module piloting)
- It is a useful tool for understanding students and their participation
- Predictions generally agree with tutors' experience and intuitions of which students might potentially be at risk
- A (potential) USP of OU Analyse was the **information provided between the assignment** submission in relation to students' engagement with learning materials
- Overall, all tutors interviewed were positive about the affordances of OUA, and are keen to use it again (for a range of reasons) in their next module

Case studies and vignettes

"I love it it's brilliant. It brings together things I already do […] it's an easy way to find information without researching around such as in the forums and look for students to see what they do when I have no contact with them […] if they do not answer emails or phones there is not much I can do. OUA tells me whether they are engaged and gives me an early indicator rather than waiting for the day they submit"

Analytics enhancement strategy



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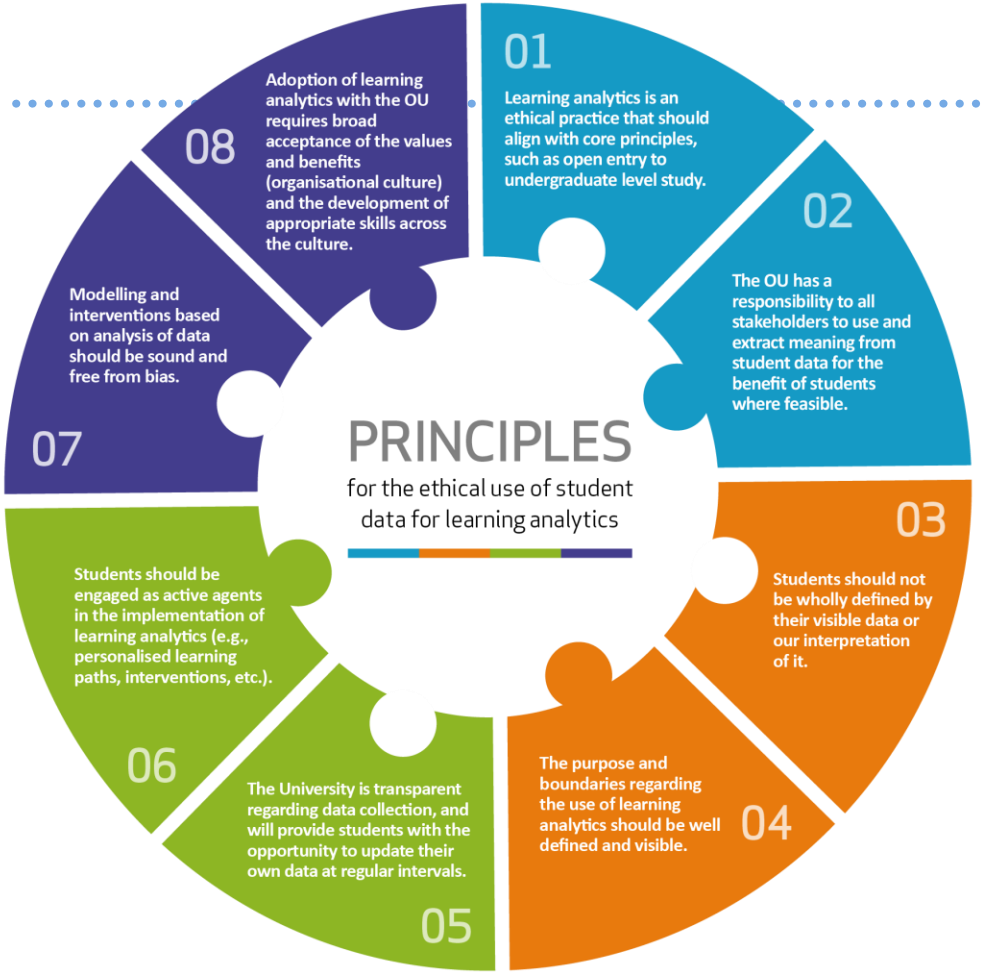
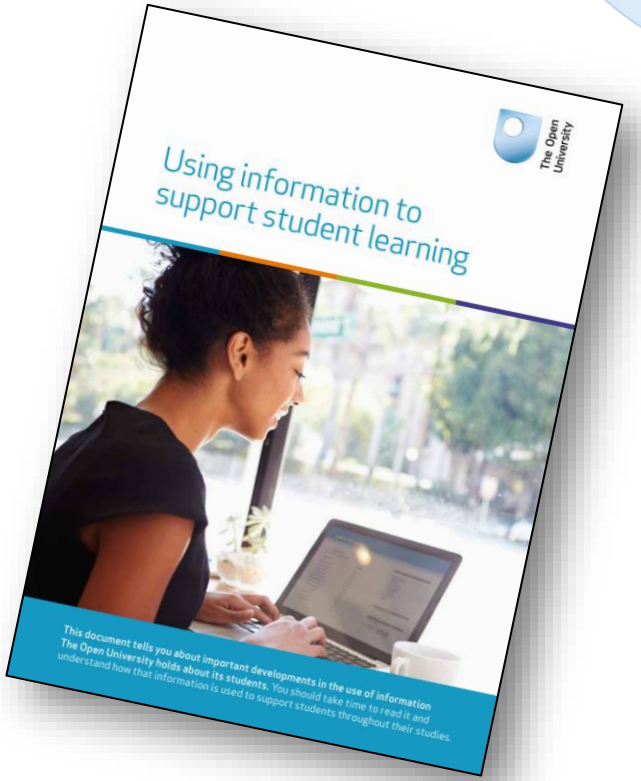
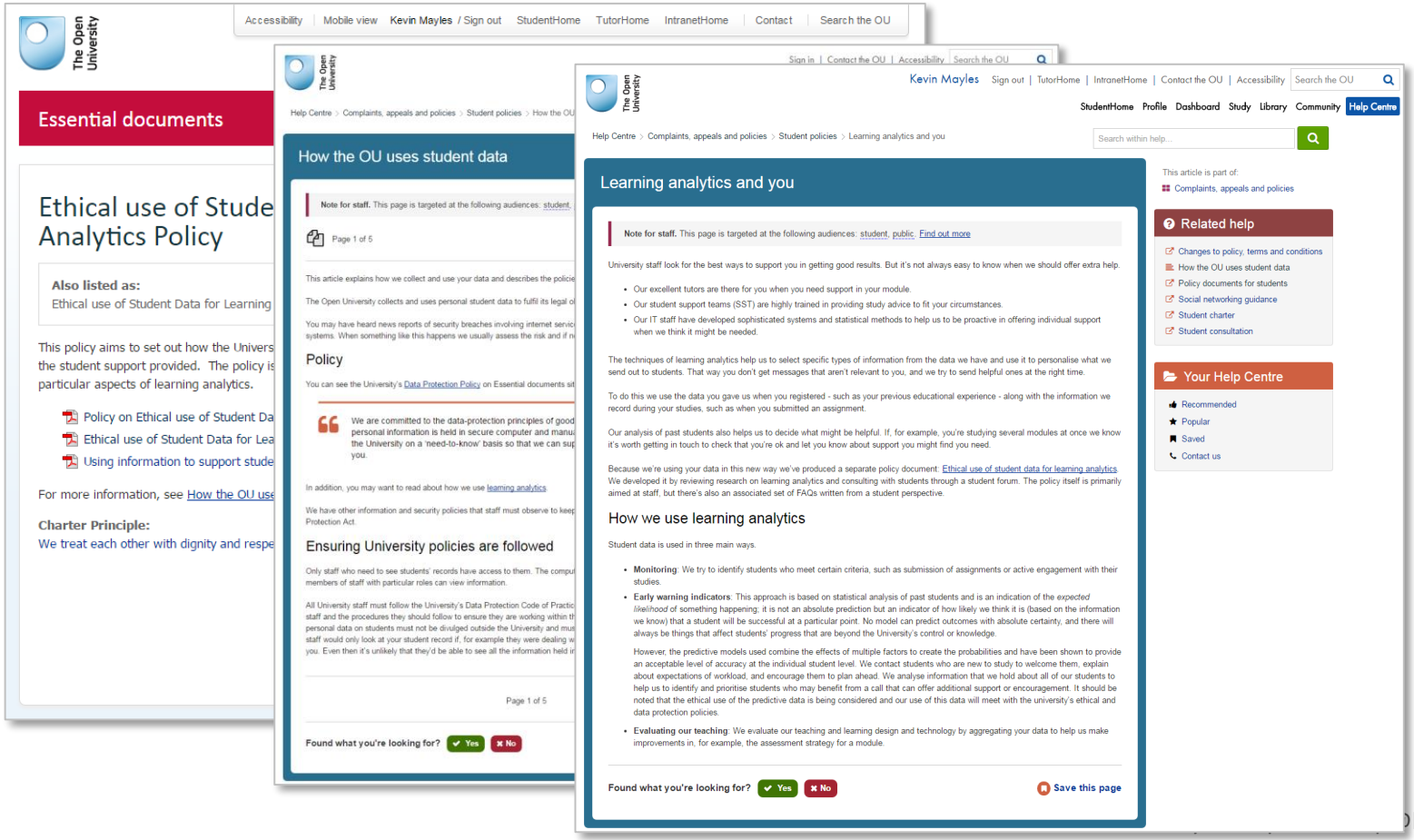




http://www.open.ac.uk/students/charter/essential-documents/ethical-use-student-data-learning-analytics-policy

Information for students



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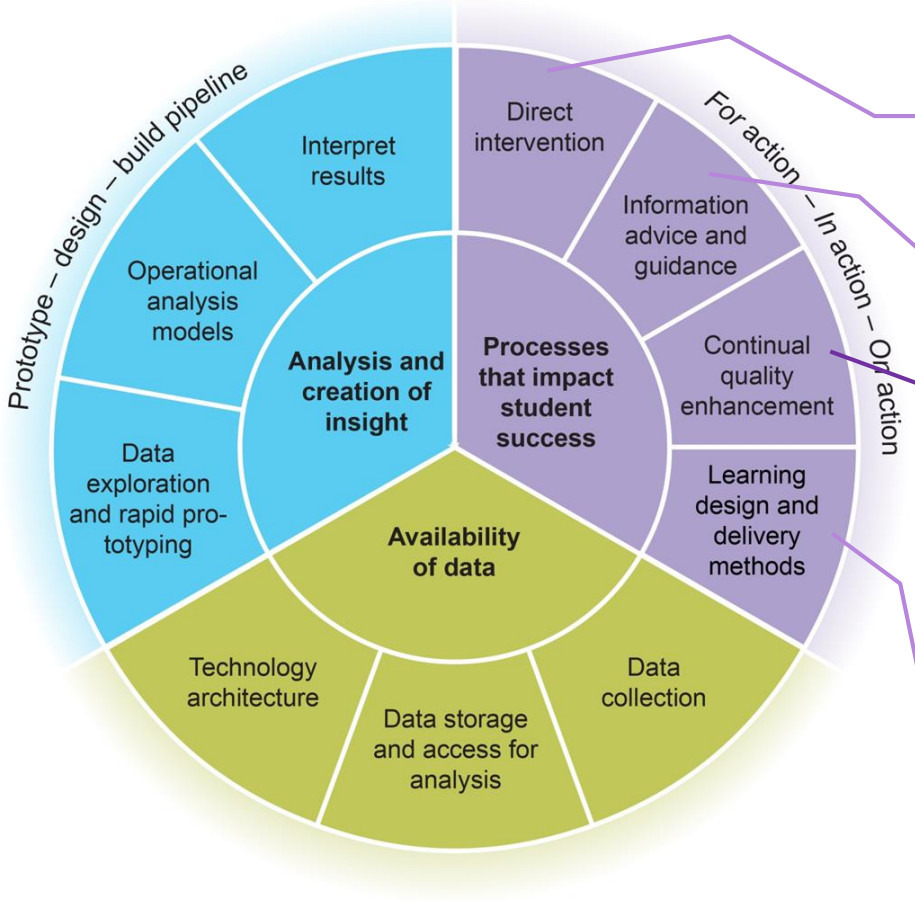

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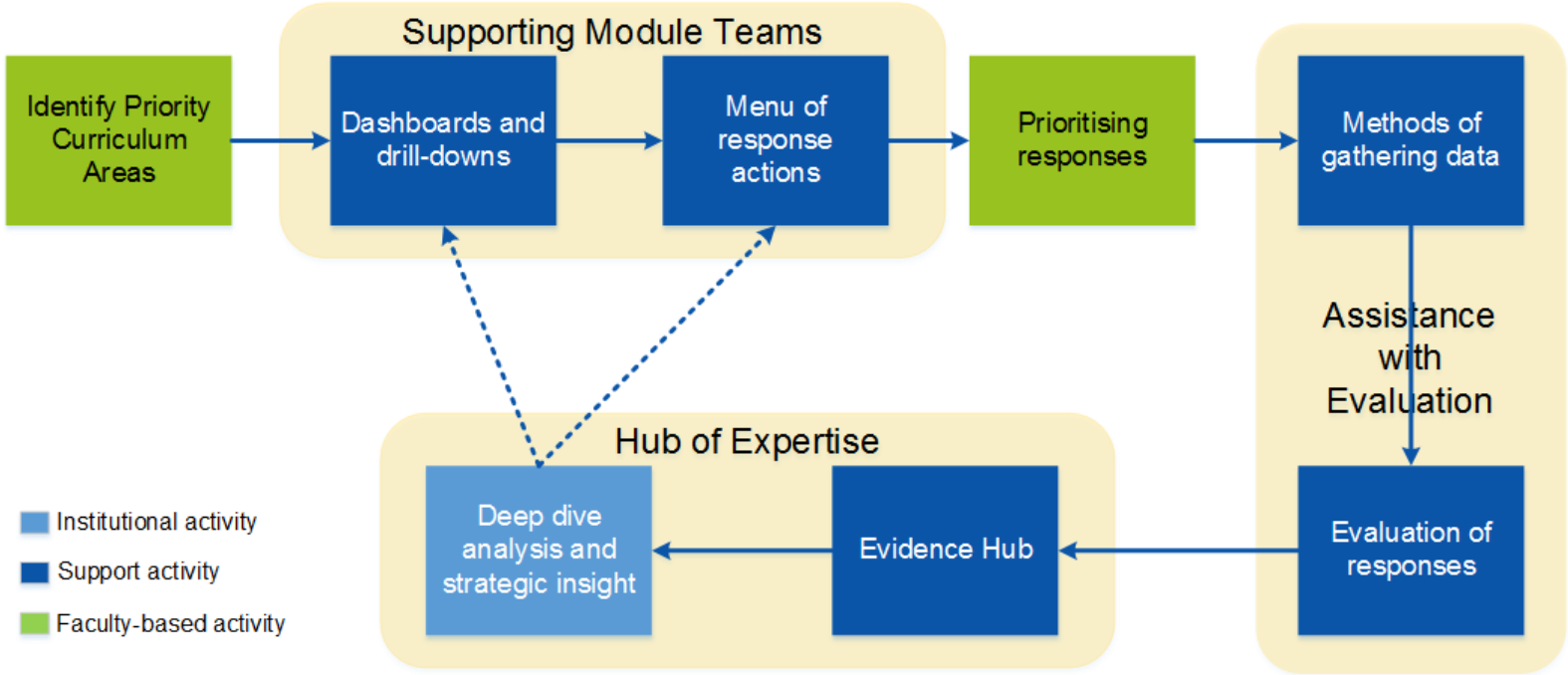
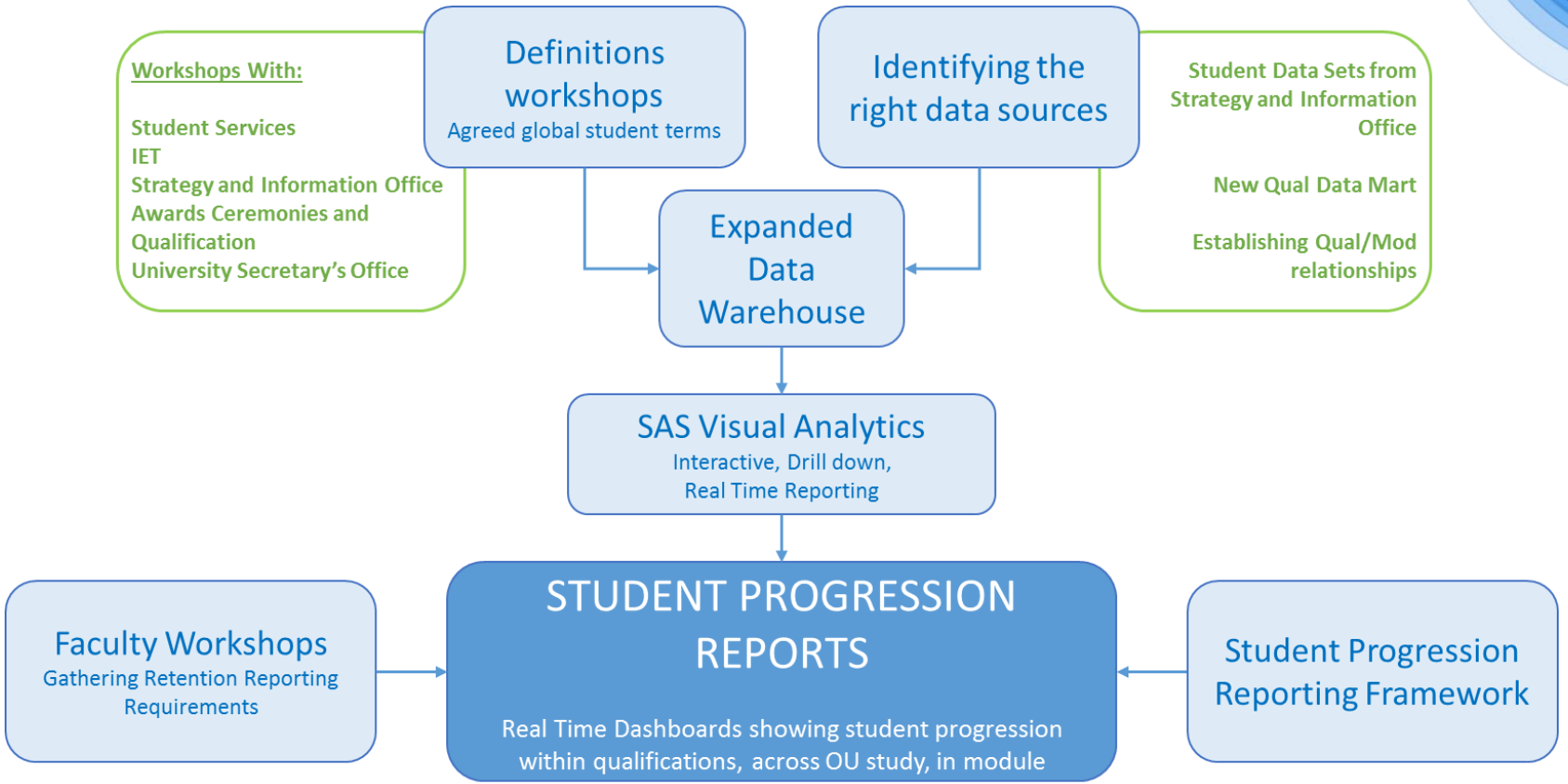
Scaffolding action

Analytics for Action Evaluation Framework and Toolkit



Real-time progression reports



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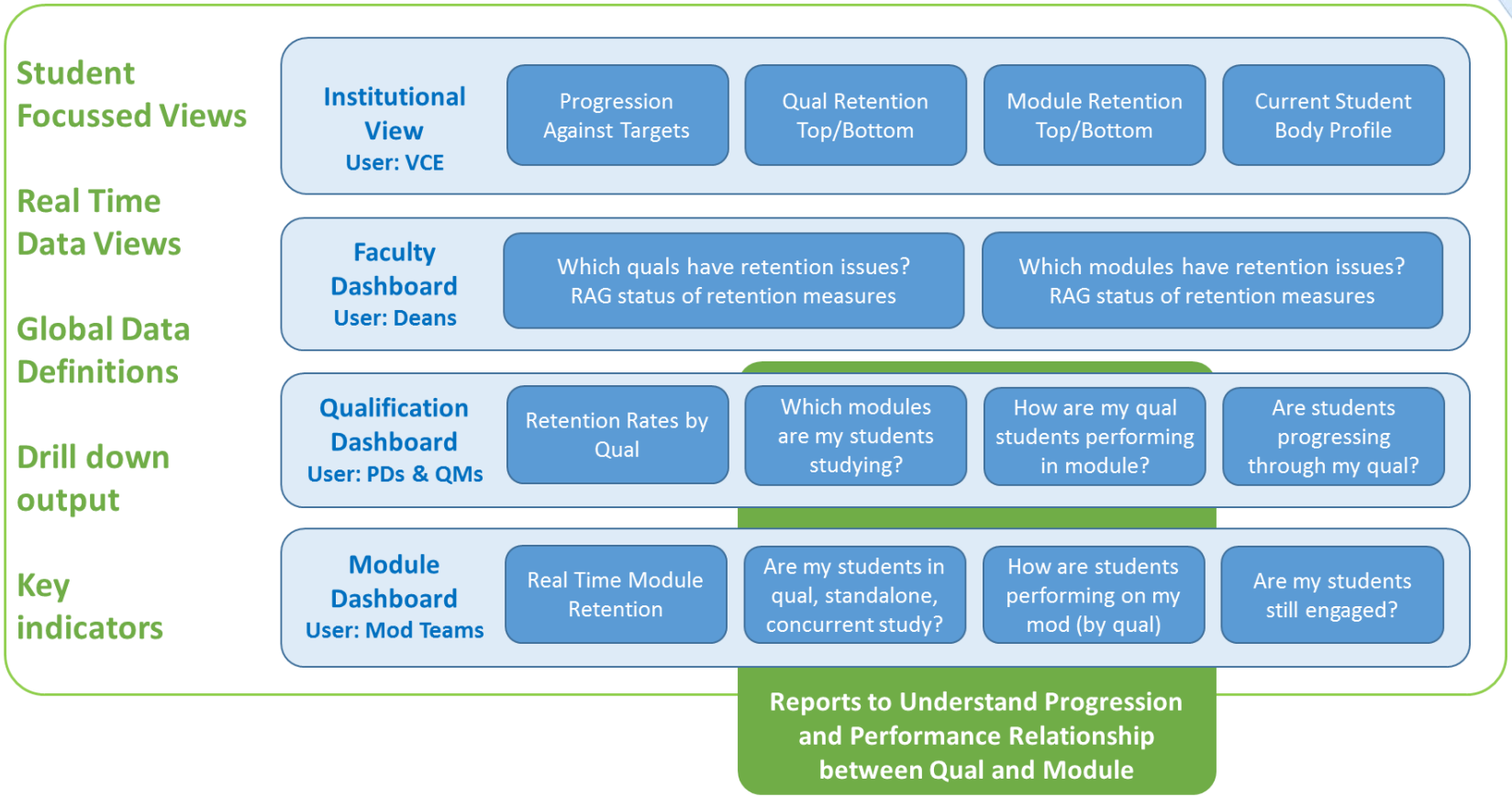


Arts | OU Level 1 | A105 | 2015J

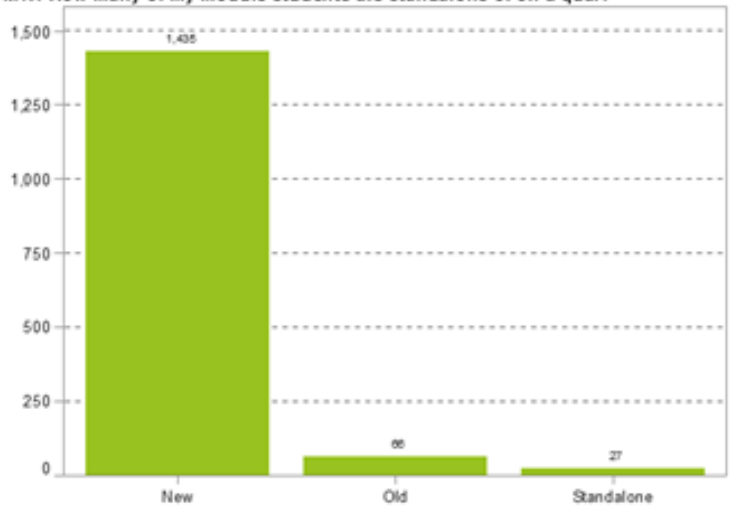
Welcome and guidance | 1. Module students | 2. Multiple Module Study | 3. Module combinations | 4. Withdrawers | 5. Assessment Scores/Submissions | 6. Assessment by qualification

Who is on A105 - Voices, texts and material culture and what are they studying?

Students at mod start	Students 25% at FLP	Current students
[redacted]	[redacted]	[redacted]

See Withdrawers section for further information on those students that have withdrawn from this module

M1.1 How many of my module students are standalone or on a qual?



M1.2 Which new framework qualifications are my students studying?

M1.3 Which old framework qualifications are my students studying?

Arts

OU Level 1

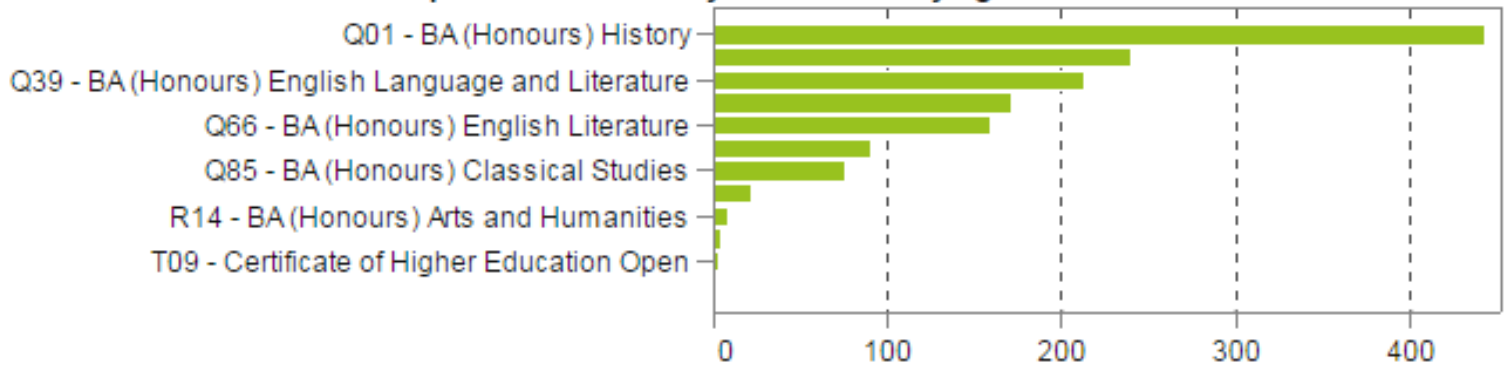
New Framework Qualifications

These are the new framework qualifications that your module students have linked this module to.

5. Assessment Scores/Submissions | 6. Assessment

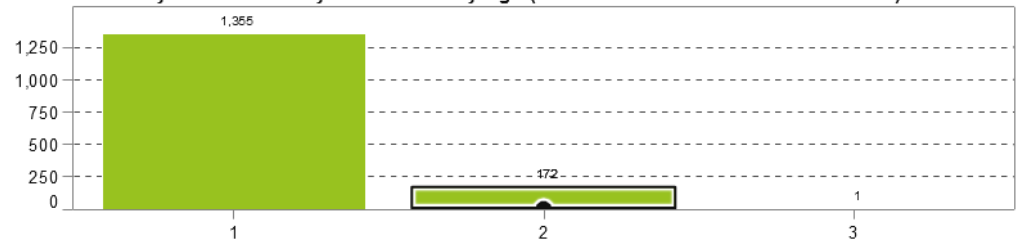
erial culture and what are they studying?

M1.2 Which new framework qualifications are my students studying?

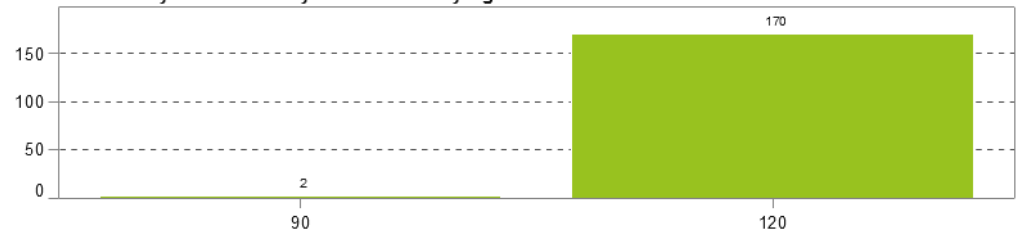


Are A105 - Voices, texts and material culture students studying multiple modules?

M2.1a How many modules are my students studying? (Click bar to filter visuals M2.1b and c)



M2.1b How many credits are my students studying?



M2.1c Which presentations are students in multiple modules studying?

M2.2 How many students are studying concurrently?

Concurrency	N students	
Concurrent	171	
Overlapping	2	
	Total:	**173**

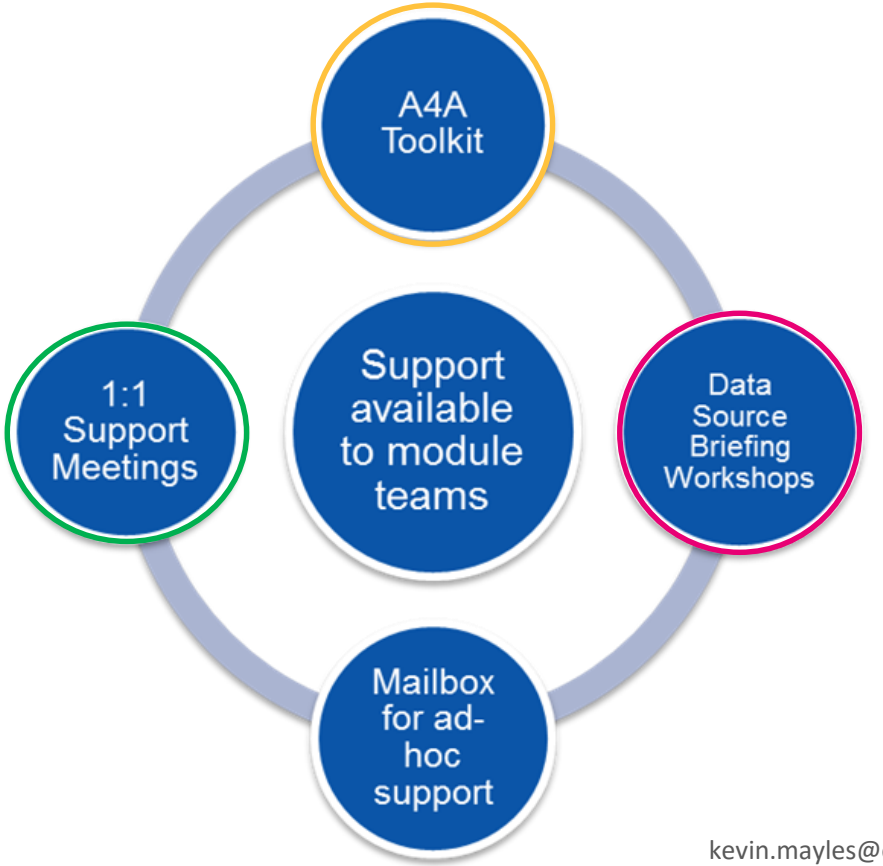
M2.3 Modules currently being studied with A105 - 20...

Choose concurrent/overlapping: Concurrency

Module	N students	Concurrency
AA100 - 2015J	112	Concurrent
A215 - 2015J	13	Concurrent
A200 - 2015J	12	Concurrent
A230 - 2015J	12	Concurrent
U214 - 2015J	5	Concurrent
A217 - 2015J	3	Concurrent
A224 - 2015J	3	Concurrent
AD281 - 2015J	2	Concurrent
A105 - 2016B	1	Overlapping
A219 - 2015J	1	Concurrent
A326 - 2015J	1	Concurrent
A327 - 2015J	1	Concurrent
A330 - 2015J	1	Concurrent
A340 - 2015J	1	Concurrent

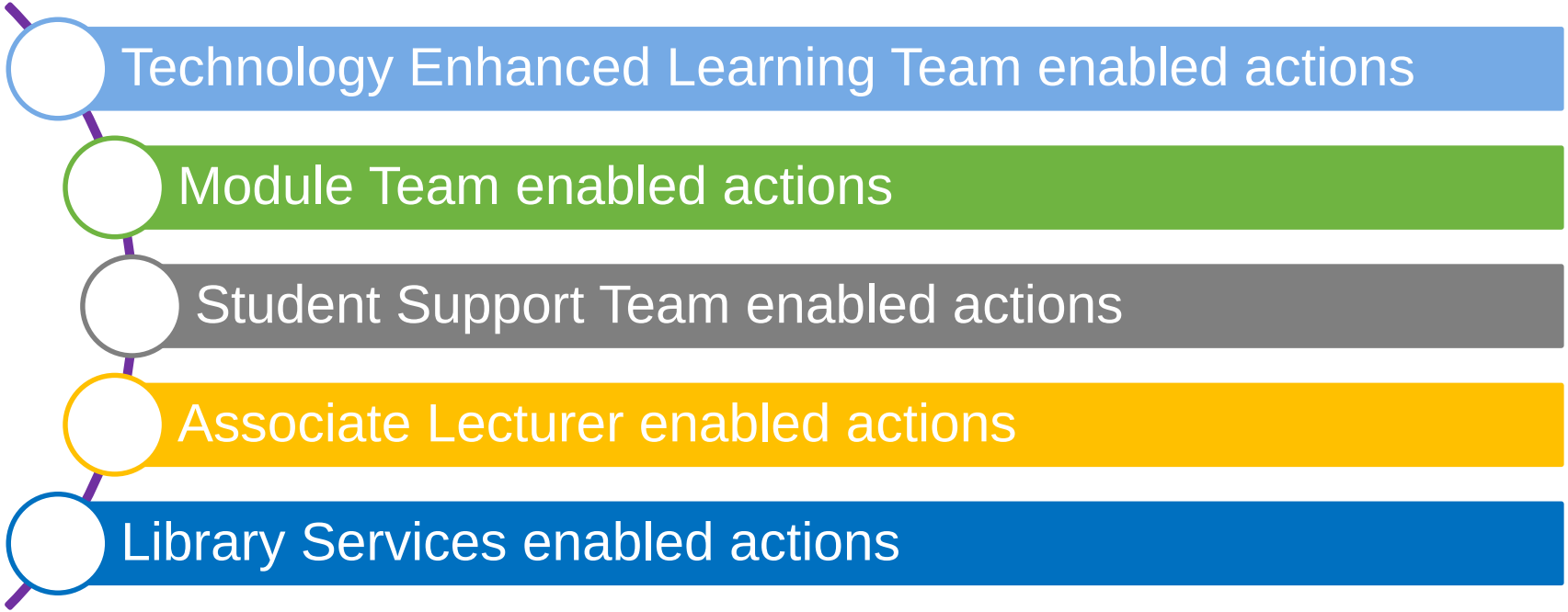
Supporting Module Teams

Working with 46 modules, meeting each team at least 3 times in the year



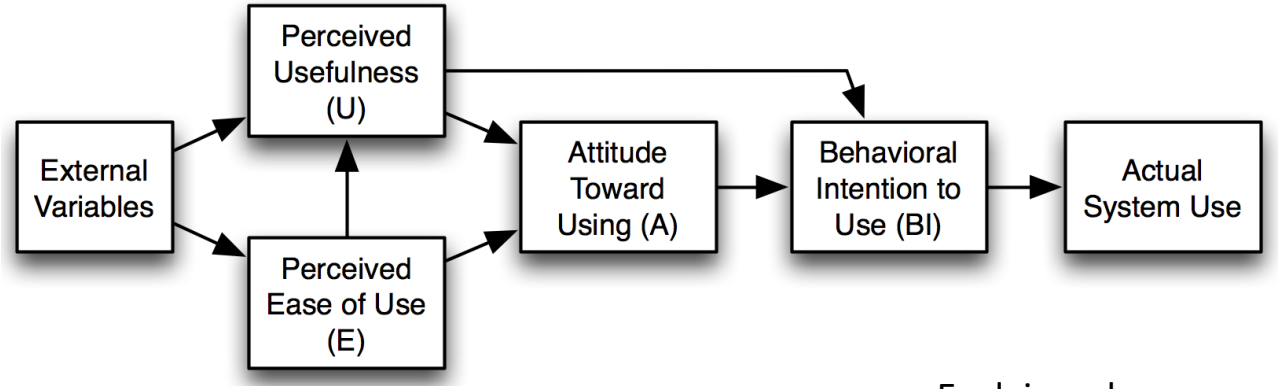
Briefed over 80 staff

Supporting module teams



Evaluating the use of the A4A Framework

Technology Acceptance Model (TAM1)



The Technology Acceptance Model, version 1. (Davis, Bagozzi & Warshaw 1989)

- Explains why a user accepts or rejects a technology.
- **Perceived usefulness** and **perceived ease of use** influence **intentions to use** and **actual behaviour**.
- Identify what factors explain future intentions to use the innovation and actual usage behaviour

Feedback from Data Source Briefing Workshops

Based on Technology Acceptance Model (TAM1)

Perceived usefulness (PU)

- Using the data tools will improve the delivery of the module.
- Using the data tools will increase my productivity.
- Using the data tools will enhance the effectiveness of the teaching on the module.

Perceived ease-of-use (PEOU)

- Learning to operate data tools is easy for me.
- I find it easy to get the data tools to do what I want them to do.
- I find the data tools easy to use.

Perceived training requirement

- I expect most staff will need formal training on the data tools

Satisfaction with Workshop

- The instructors were enthusiastic in the data briefing.
- The instructors provided clear instructions on what to do.
- Overall, I am satsified with the workshop.

Feedback from Data Support Meetings

Based on Technology Acceptance Model (TAM1)

Perceived usefulness (PU)

- Using the data tools from the support meeting will enhance the effectiveness of the teaching on the module.
- Using the data tools from the support meeting will improve the delivery of my module.
- Using the data tools from the support meeting will increase my productivity.

Perceived ease-of-use (PEOU)

- I find it easy to get the data tools used in the support meetings to do what I want them to do.
- I find the tools used in the support meeting easy to use.
- Learning to operate the data tools used in the support meeting is easy for me.

Perceived training requirement

- Based upon my experience with the data tools used in the support meeting, I expect that most staff will need formal training to use these tools.

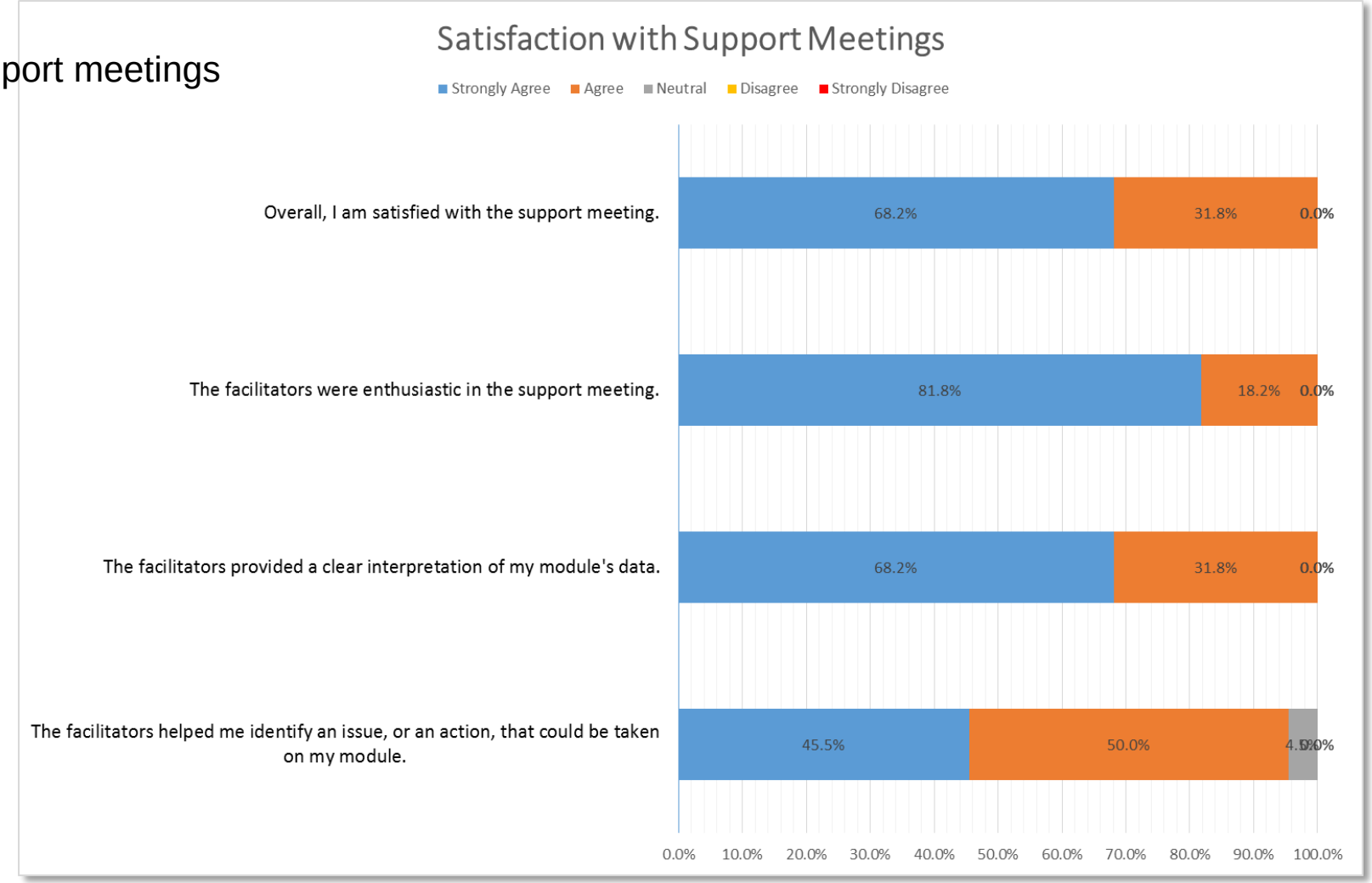
Satisfaction with Workshop

- The facilitators helped me identify an issue, or an action, that could be taken on my module.
- The facilitators provided a clear interpretation of my module's data.
- The facilitators were enthusiastic in the support meeting.
- Overall, I am satisfied with the support meeting.

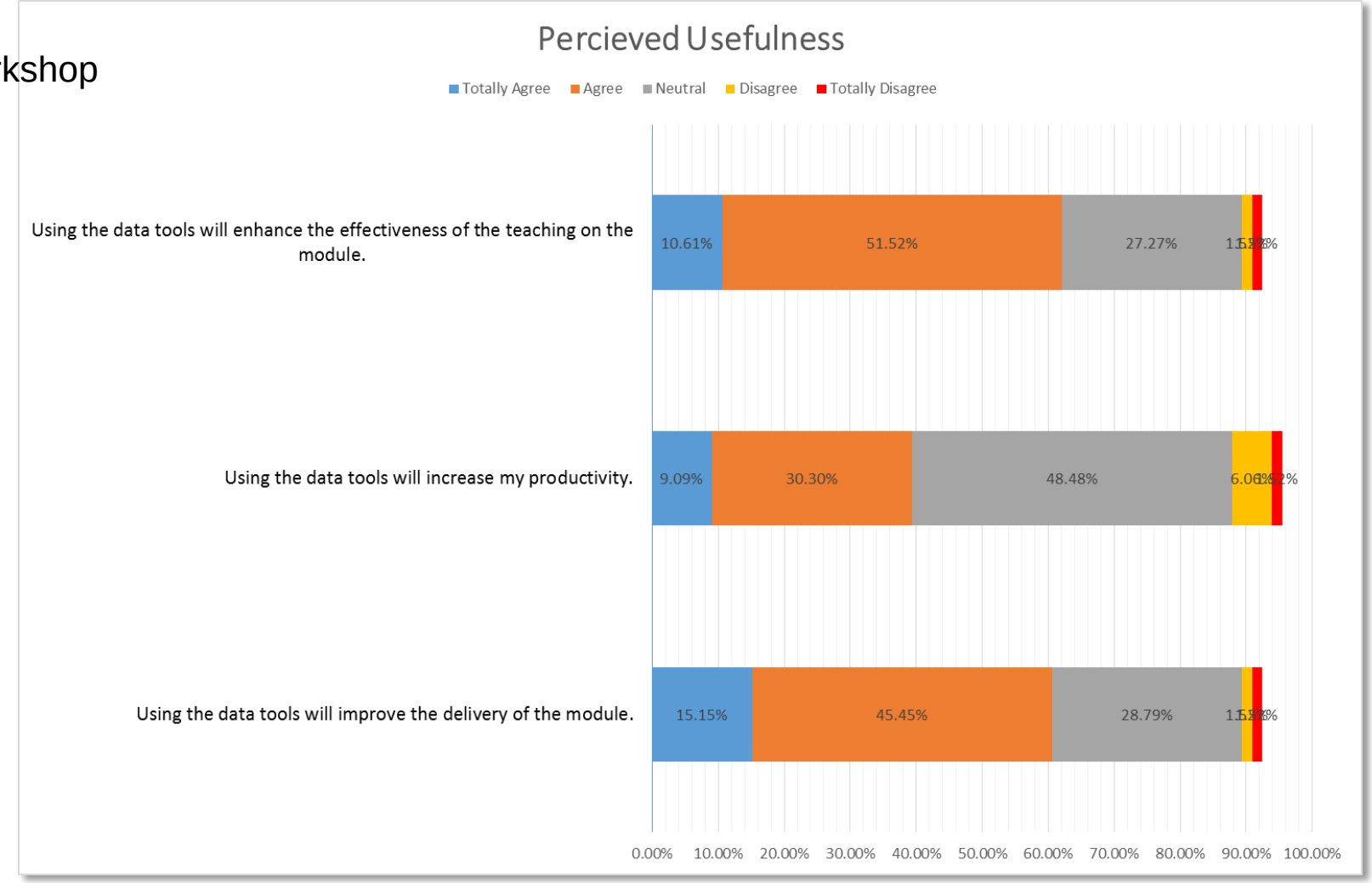
Workshop


Satisfaction with Workshop
Totally Agree
Agree
Neutral
Disagree
Totally Disagree
Overall, I am satsified with the workshop.
42.42%
46.97%
9.09%
1.52%
The instructors provided clear instructions on what to do.
48.48%
37.88%
12.12%
1.52%
The instructors were enthusiastic in the data briefing.
62.12%
36.36%
0.00%
0.00%
0.00%
10.00%
20.00%
30.00%
40.00%
50.00%
60.00%
70.00%
80.00%
90.00%
100.00%

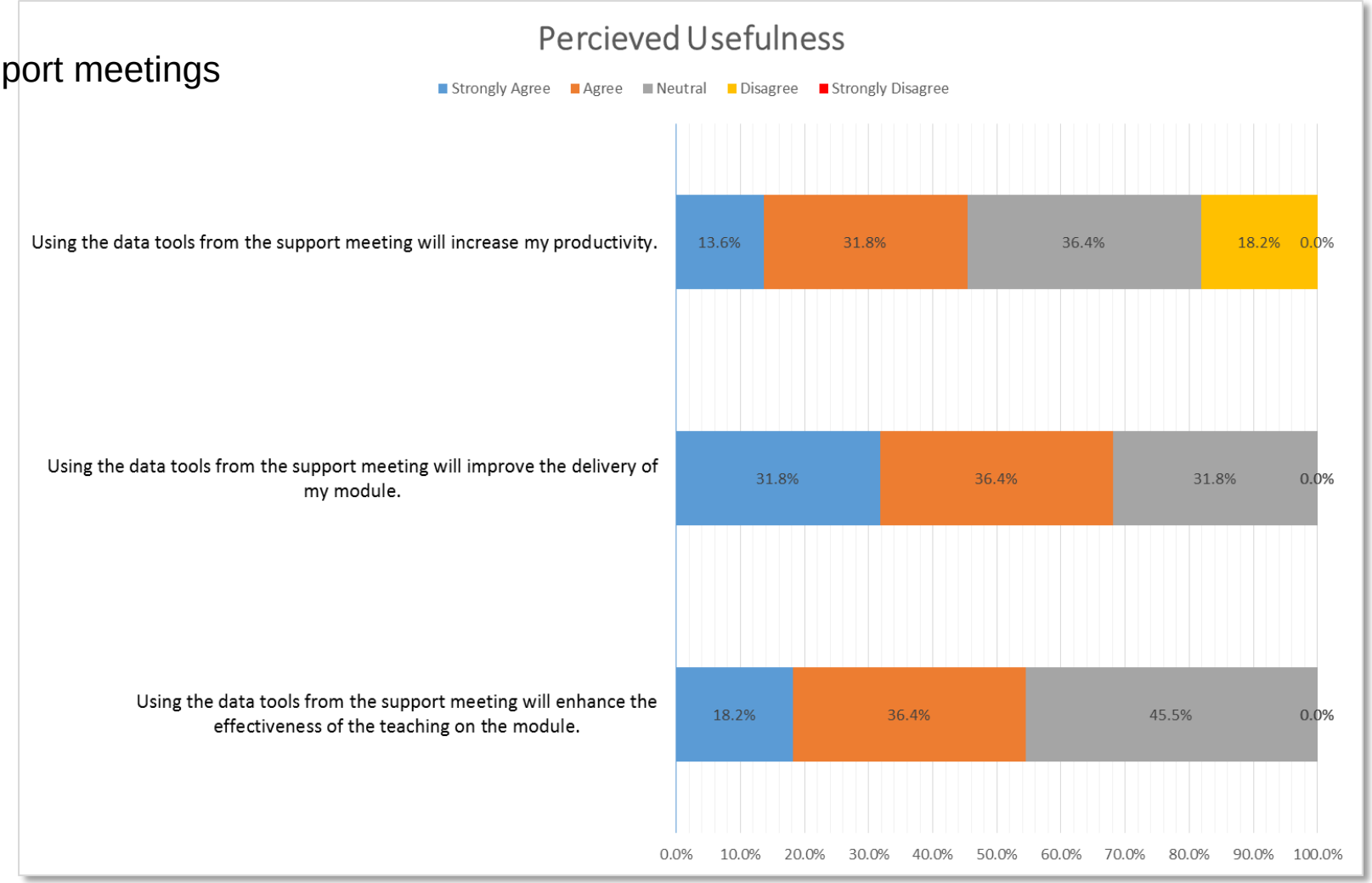
Support meetings



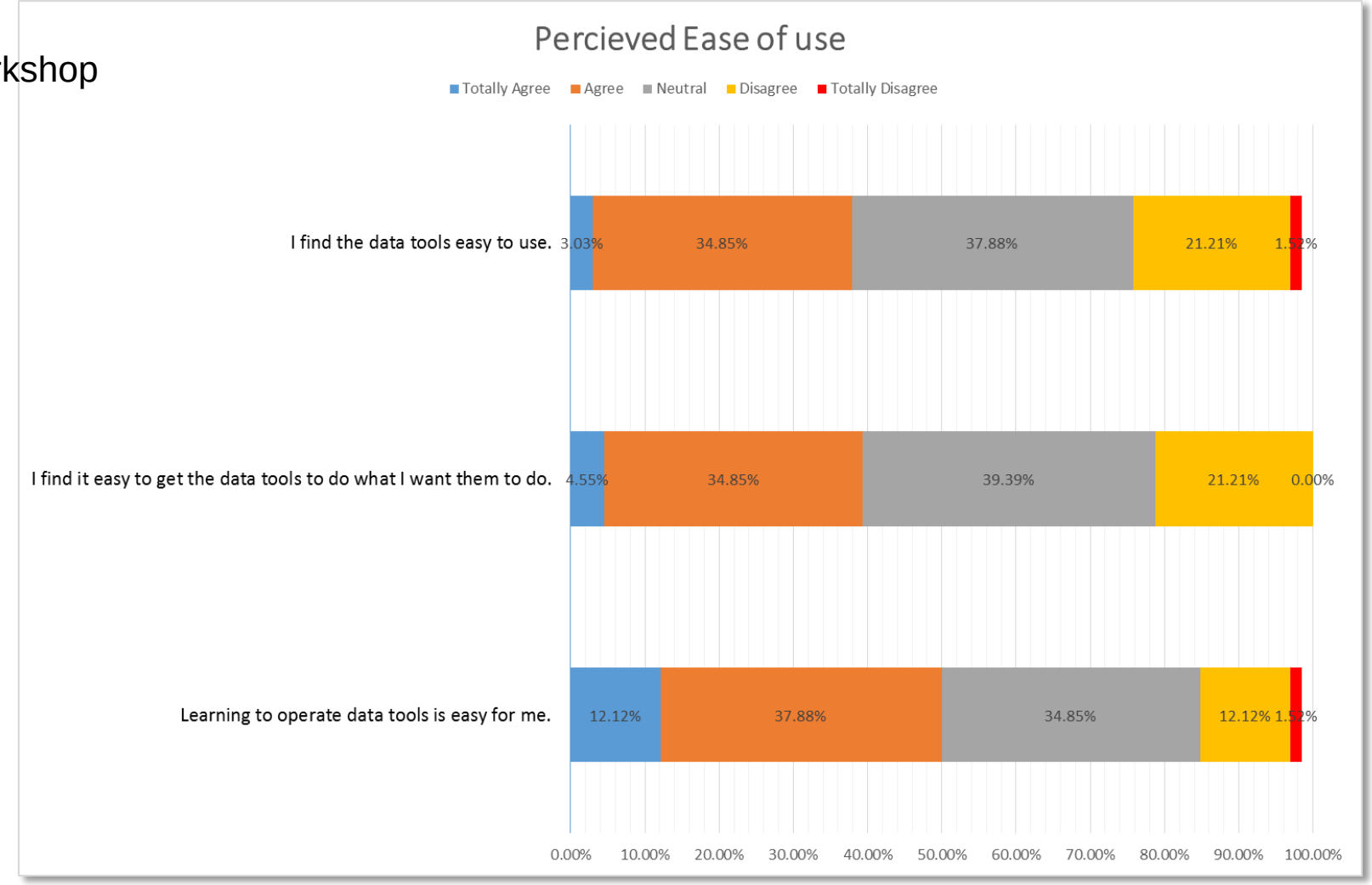
Workshop


Percieved Usefulness
Totally Agree
Agree
Neutral
Disagree
Totally Disagree
Using the data tools will enhance the effectiveness of the teaching on the module.
10.61%
51.52%
27.27%
Using the data tools will increase my productivity.
9.09%
30.30%
48.48%
Using the data tools will improve the delivery of the module.
15.15%
45.45%
28.79%
0.00%
10.00%
20.00%
30.00%
40.00%
50.00%
60.00%
70.00%
80.00%
90.00%
100.00%

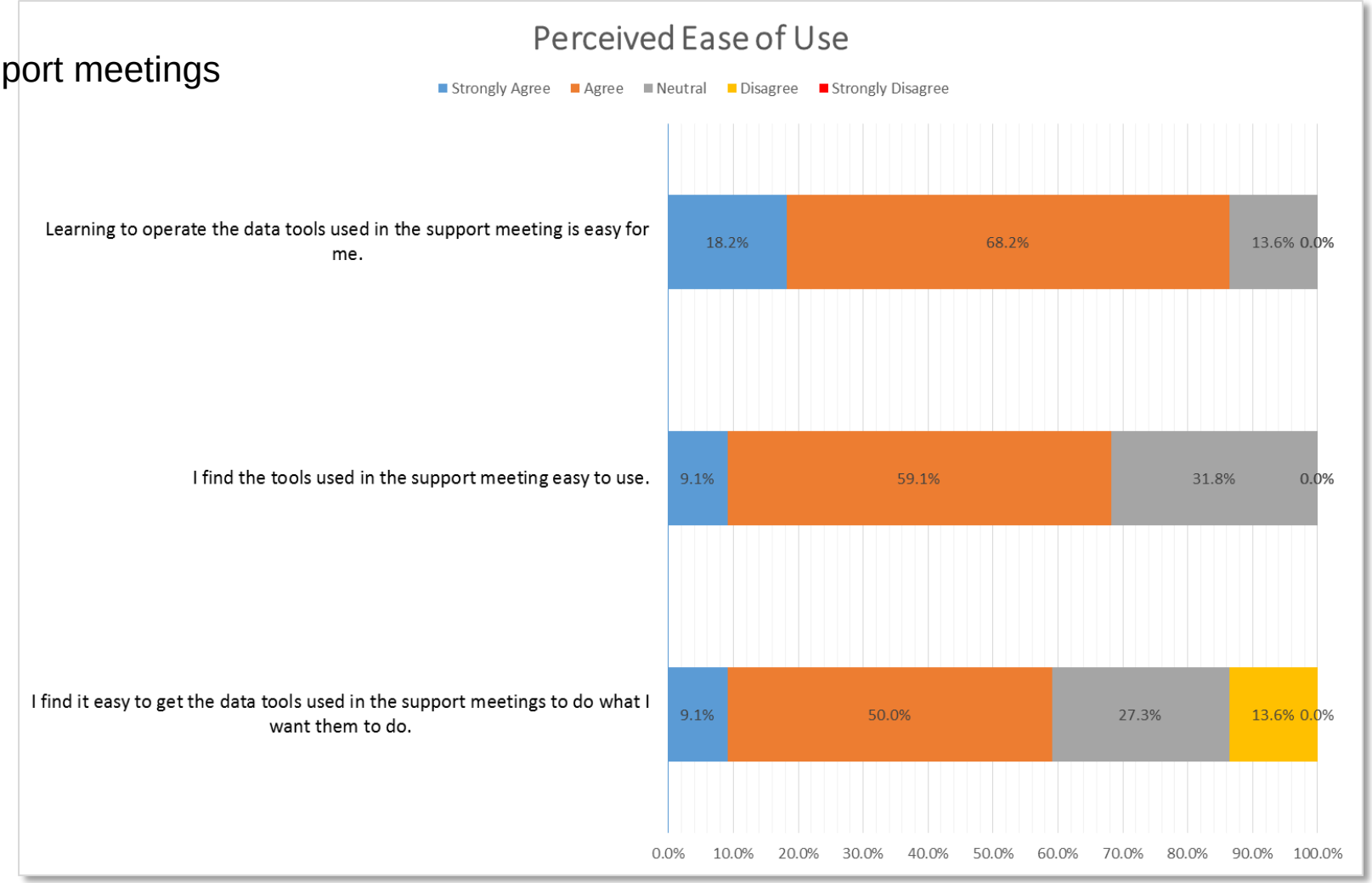
Support meetings



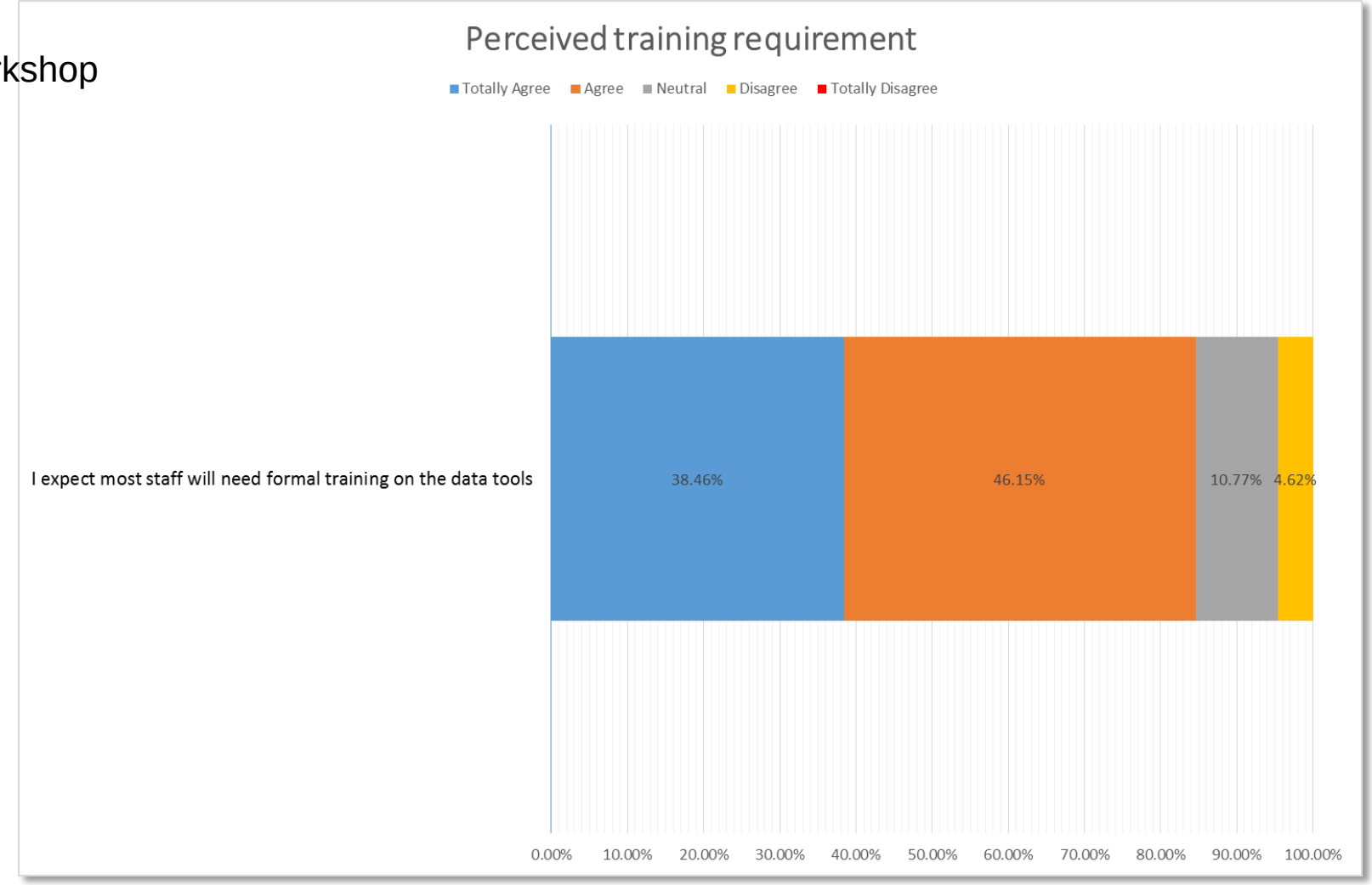
Workshop


Percieved Ease of use
Totally Agree
Agree
Neutral
Disagree
Totally Disagree
I find the data tools easy to use.
3.03%
34.85%
37.88%
21.21%
1.52%
I find it easy to get the data tools to do what I want them to do.
4.55%
34.85%
39.39%
21.21%
0.00%
Learning to operate data tools is easy for me.
12.12%
37.88%
34.85%
12.12%
1.52%
0.00%
10.00%
20.00%
30.00%
40.00%
50.00%
60.00%
70.00%
80.00%
90.00%
100.00%

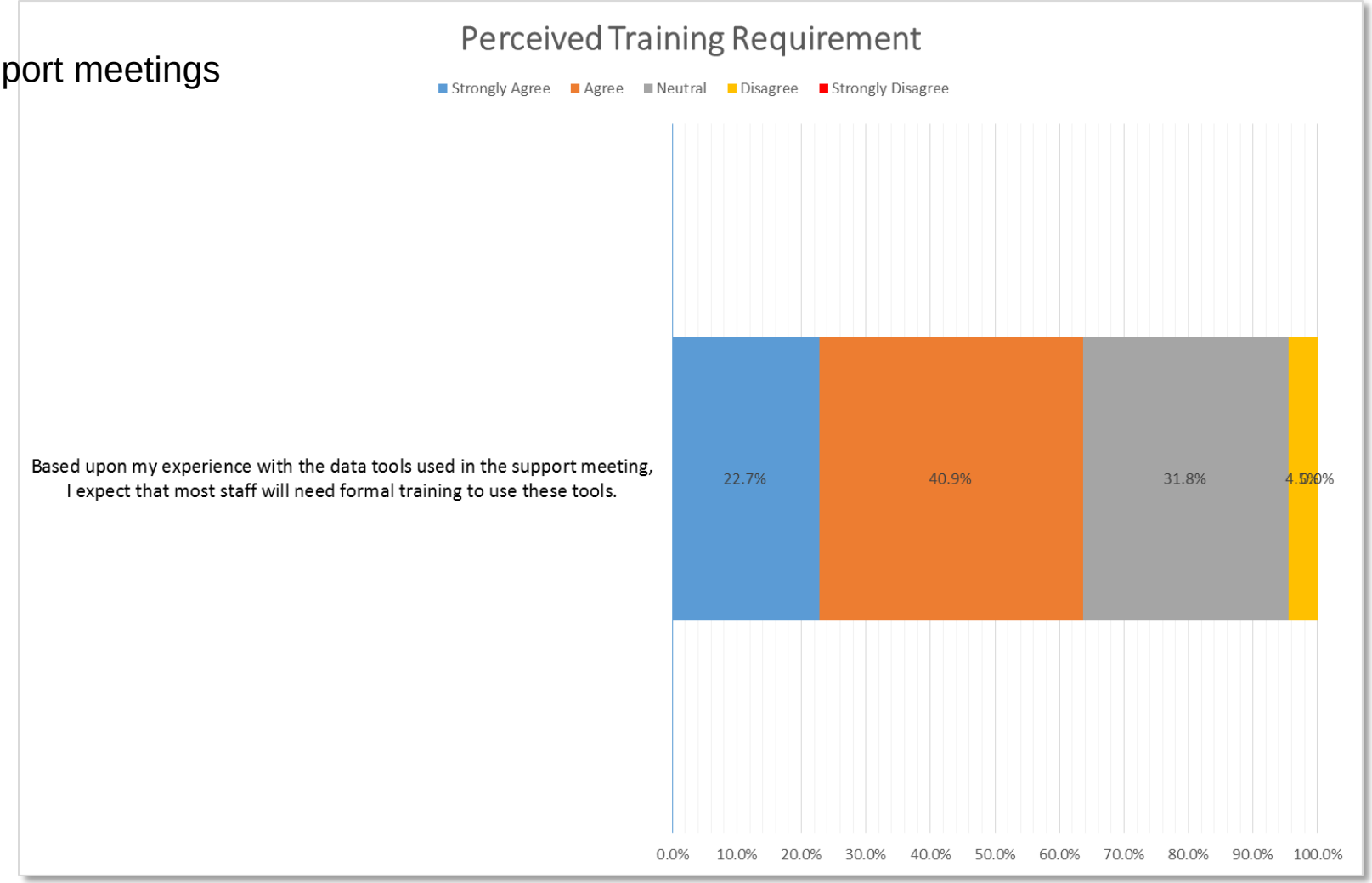
Support meetings



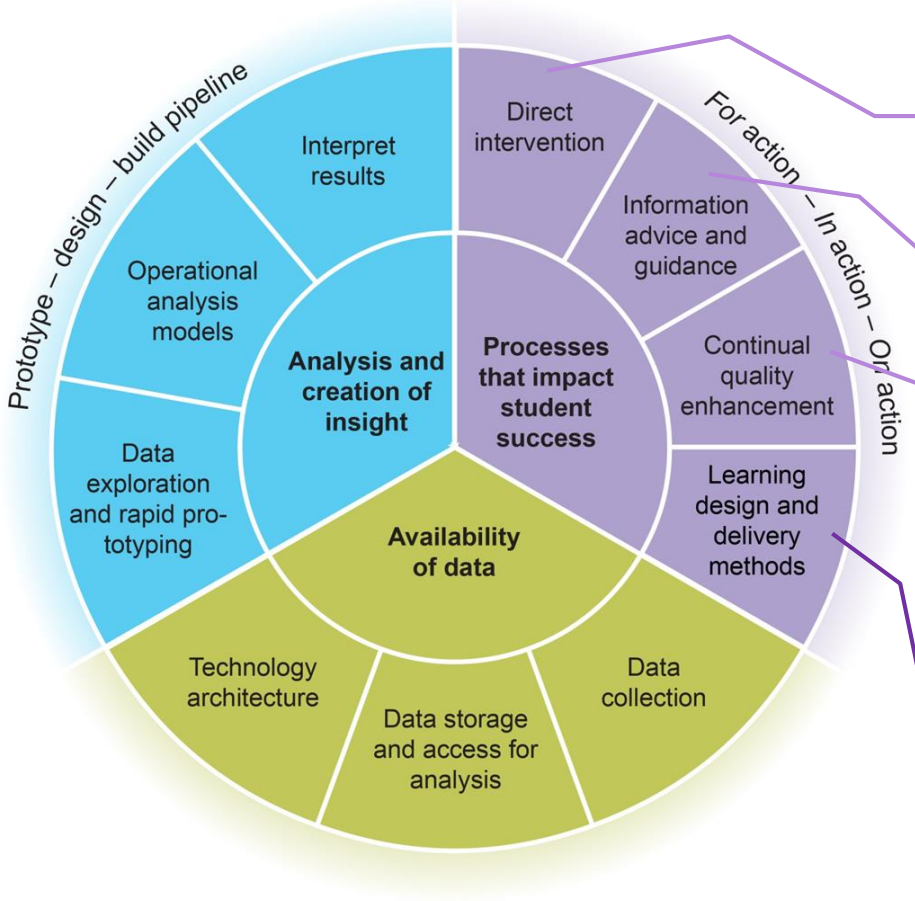
Workshop


Perceived training requirement
Totally Agree
Agree
Neutral
Disagree
Totally Disagree
I expect most staff will need formal training on the data tools
38.46%
46.15%
10.77%
4.62%
0.00%
10.00%
20.00%
30.00%
40.00%
50.00%
60.00%
70.00%
80.00%
90.00%
100.00%

Support meetings



Analytics enhancement strategy



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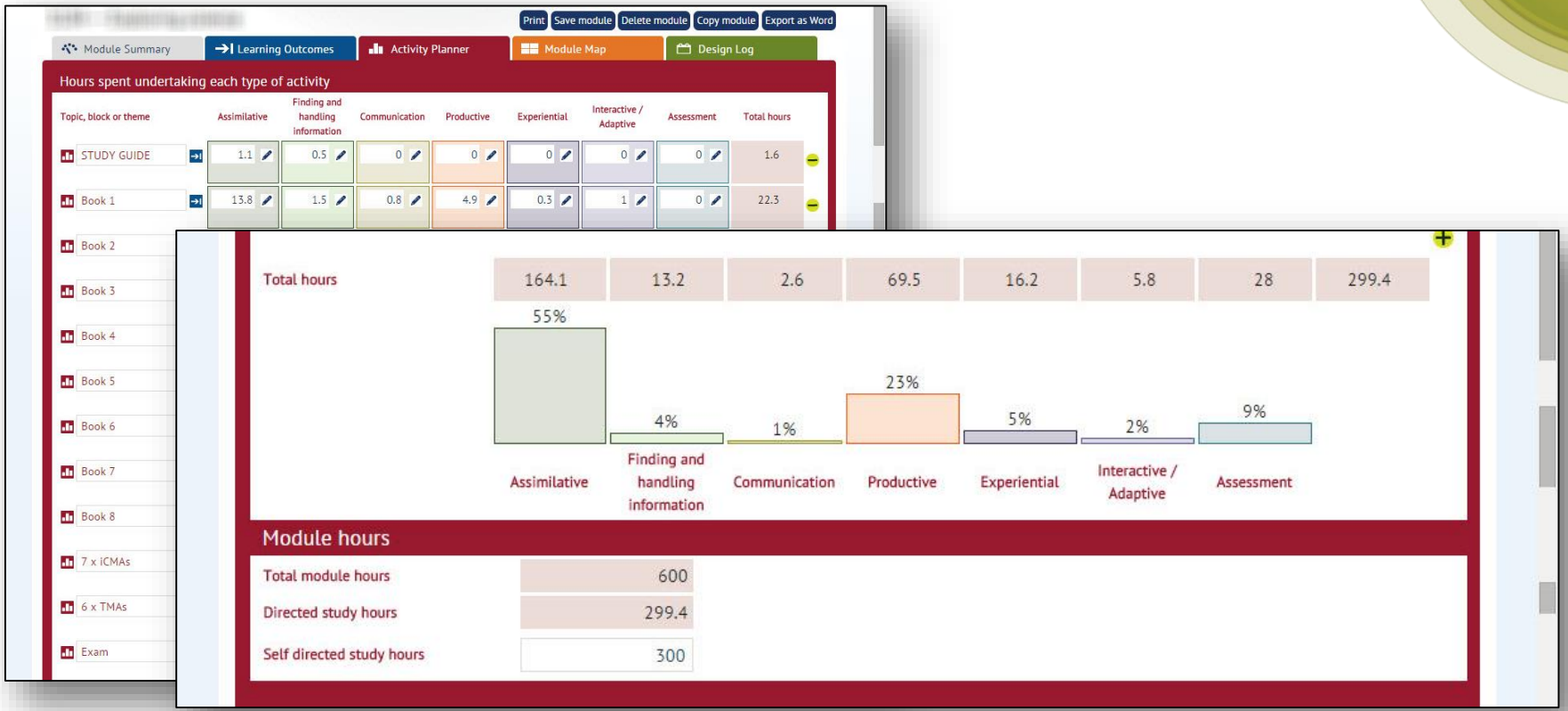
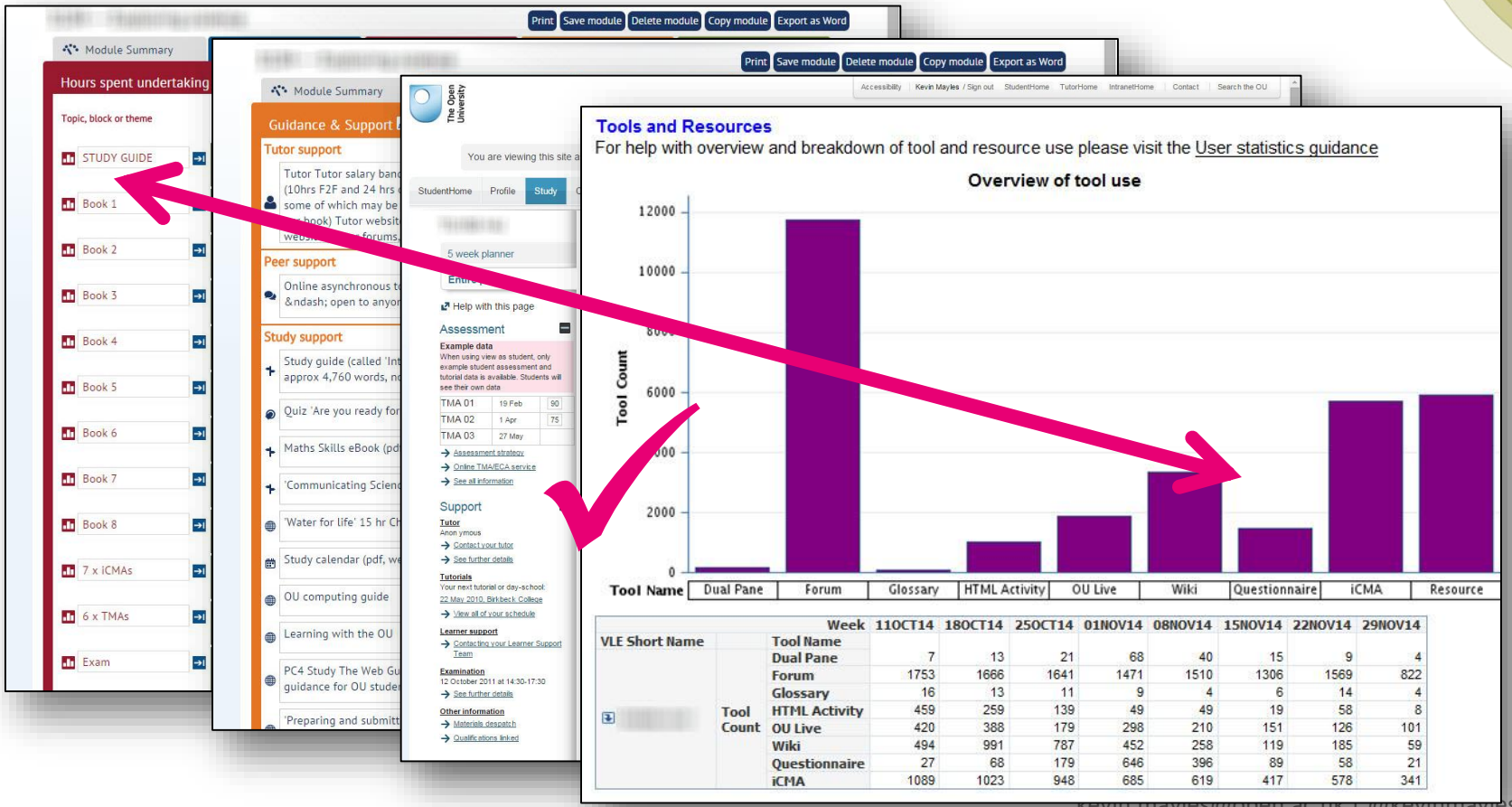
Learning design link to success



Learning design link to success



VLE Short Name		Week	11OCT14	18OCT14	25OCT14	01NOV14	08NOV14	15NOV14	22NOV14	29NOV14
		Tool Name								
	Tool Count	Dual Pane	7	13	21	68	40	15	9	4
		Forum	1753	1666	1641	1471	1510	1306	1569	822
		Glossary	16	13	11	9	4	6	14	4
		HTML Activity	459	259	139	49	49	19	58	8
		OU Live	420	388	179	298	210	151	126	101
		Wiki	494	991	787	452	258	119	185	59
		Questionnaire	27	68	179	646	396	89	58	21
		iCMA	1089	1023	948	685	619	417	578	341

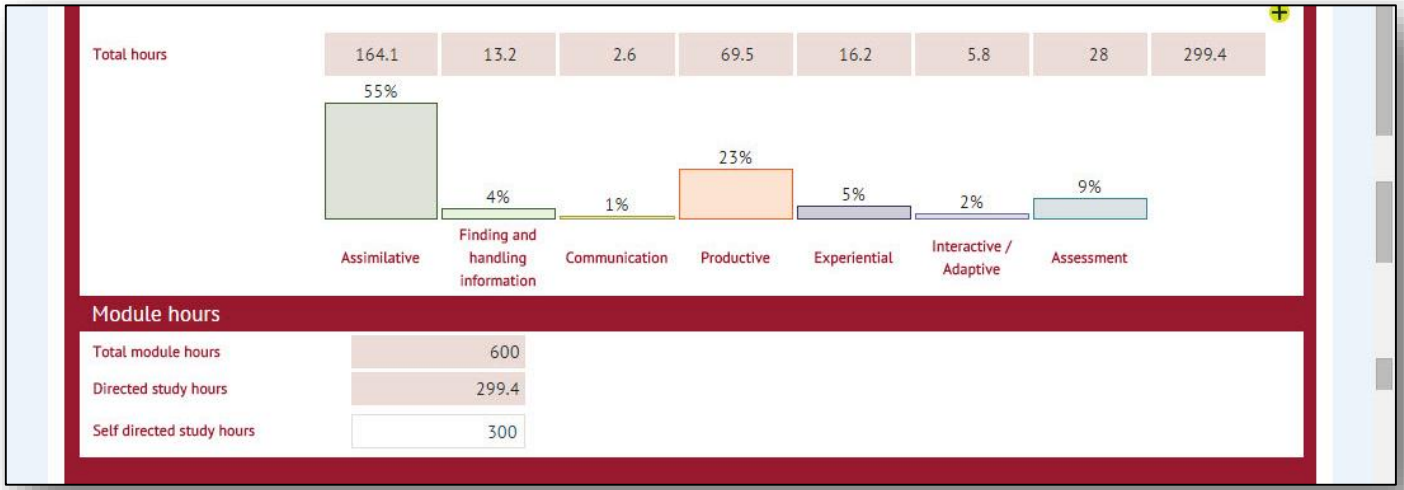
Constructivist Learning Design

Assessment Learning Design

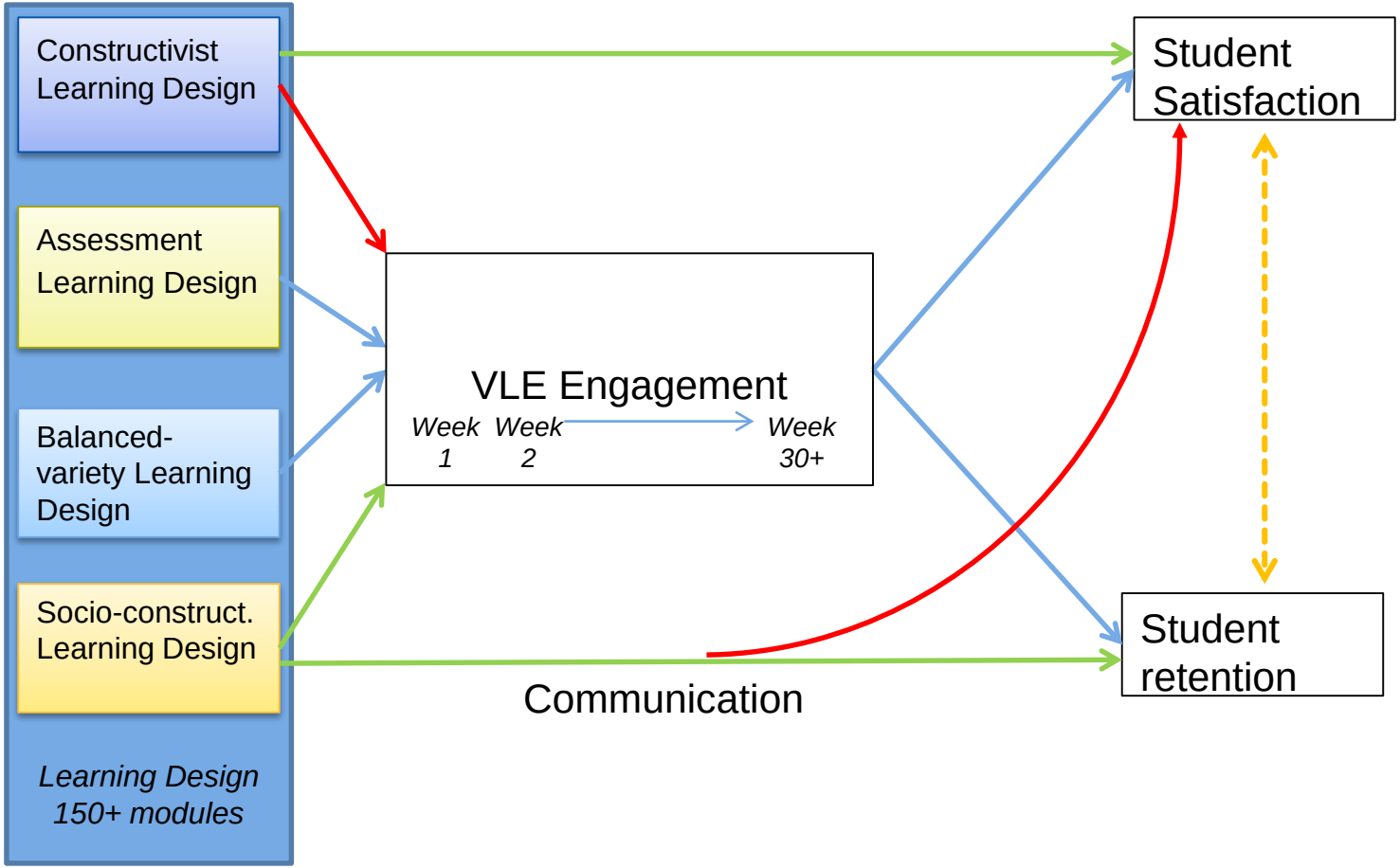
Balanced-variety Learning Design

Socio-construct. Learning Design

Learning Design 150+ modules

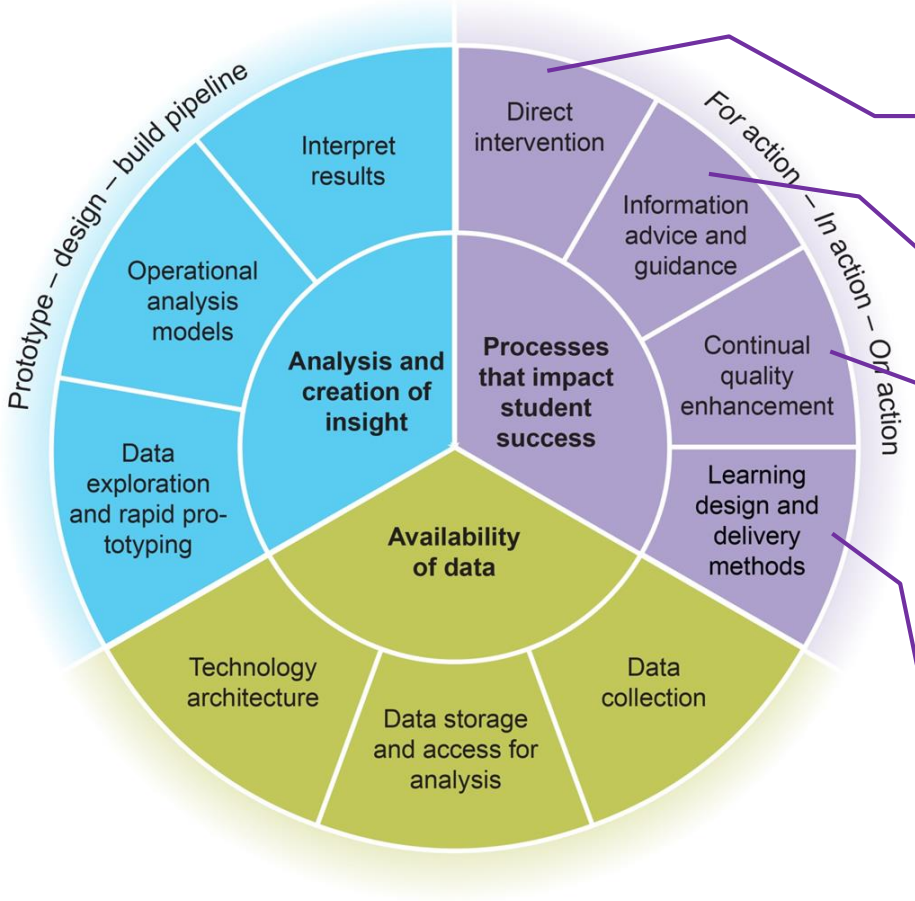


Rienties, B. and Toetenel, L. (2016)



Rienties, B. and Toetenel, L. (2016)

Analytics enhancement strategy



Early alert indicators using predictive analytics

Policy on the ethical use of student data for learning analytics

Analytics for action evaluation framework

Impact of learning design on outcomes

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Blackboard "A successful analytics implementation is a cultural challenge, not a technological one." - Mike Sharkey, VP of Analytics, presenting at the AIR Forum

Are there any questions?

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References:

BARTON, D. and COURT, D., 2012. Making Advanced Analytics Work For You. Harvard business review, 90(10), pp. 78-83.

CALVERT, C.E., 2014. Developing a model and applications for probabilities of student success: a case study of predictive analytics. Open Learning: The Journal of Open, Distance and e-Learning.

KUZILEK, J., HLOSTA, M., HERRMANNOVA, D., ZDRAHAL, Z. and WOLFF, A., 2015. OU Analyse: Analysing At-Risk Students at The Open University. Learning Analytics Review, no. LAK15-1, March 2015, ISSN: 2057-7494

RIENTIES, B. and TOETENEL, L., 2016. The impact of learning design on student behaviour, satisfaction and performance: a cross-institutional comparison across 151 modules. Computers in Human Behavior, 60 pp. 333–341.

SCHÖN, D.A., 1987. Educating the reflective practitioner: Toward a new design for teaching and learning in the professions. San Francisco, CA, US: Jossey-Bass.