@DrBartRienties

Professor of Learning Analytics

Learning analytics at the Open University and the UK: reviewing 6 years of implementation at scale
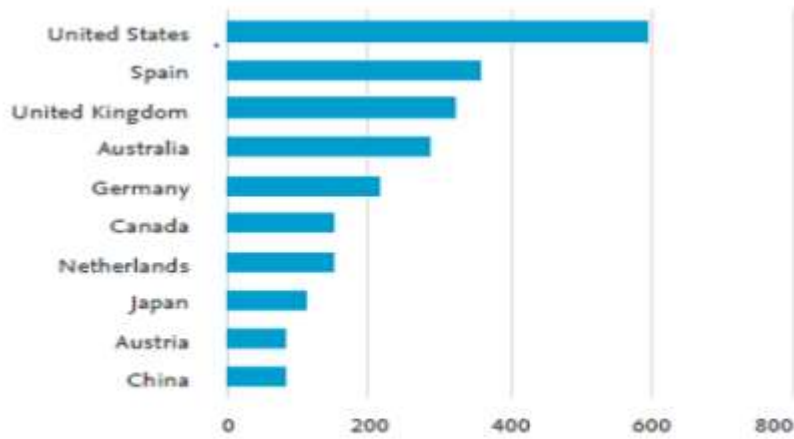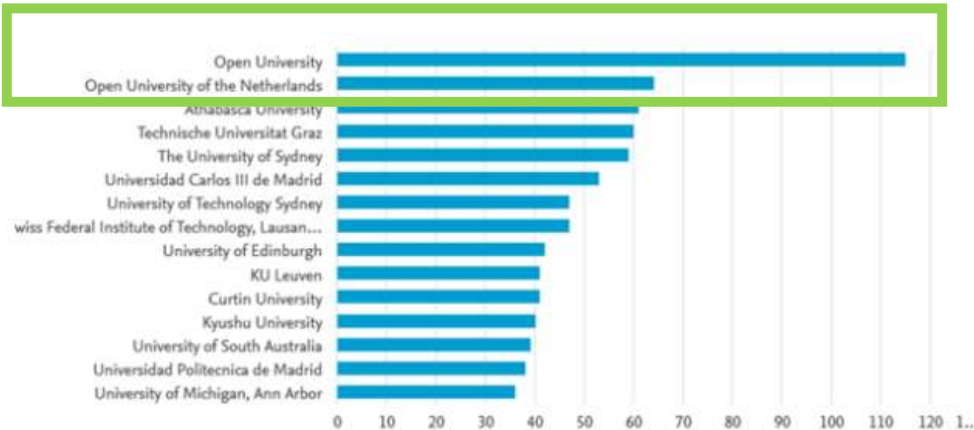
Webinar 11 June 2020

Figure 7: Learning Analytics Affiliation by County - ALL

Table 15: Learning Analytics Leading Author Profile

Author / Institution Country	Cited	%	H	Subject Areas
Pardo, Abelardo AUS U of Sydney	45	1.6	21	Learning Analytics, Learning Technologies, Technology Enhanced Learning, Learning Design, Educational Technology
Draschsler, Hendrick NLD- The Open University	40	1.5	28	Educational Technologies, Learning Analytics, Recommender Systems, Medical Education, Self-Regulated Learning
Dawson, Shane AUS U of South Australia	33	1.2	35	Learning Analytics, Social Network Analysis, Technology Enhanced learning, Learning Design Education
Rienties, Bart GBR The Open University	32	1.2	27	Learning Analytics, Learning Design, Social Network Analysis, Computer-Supported Collaborative Learning
Kinshuk USA U of North Texas	31	1.1	46	Online learning, Mobile learning, Ubiquitous Learning, Cognitive Profiling, Adaptivity Information
Kloos, Carlos D ESP U of Carlos III Madrid	31	1.1	35	Digital Education, Technology-enhanced, Learning, Educational Technology, MOOCs, eLearning
Munz-Merino, Pedro ESP U of Carlos III Madrid	31	1.1	21	Educational Data Mining, Learning Analytics, Gamification, Educational Technology
Gasevic, Dragan AUS Monash University	30	1.1	51	Learning Analytics, Self-regulated learning, Technology, Enhanced Learning, Collaborative Learning, Learning Technologies
Ebner, Martin AUT Graz University	28	1.0	35	E-learning, Open Educational Resources, Learning Analytics MOOC TEL
Ferguson, Rebecca GBR The Open University	28	1.0	24	Education, Learning Analytics, MOOCs, Distance Learning, Online learning
Verbert, Katrien BEL KU Leven	26	1.0	31	HCI, Visualization user interfaces for recommender systems, Technology Enhanced Learning, Digital Humanities
Scheffel, Maren UK The Open University	25	1.0	14	Learning Analytics, Evaluation Self-Regulated Learning, Learning Design
Ogata, Hiroaki JPN Kyoto University	24	.9	30	Educational Data Science, Learning Analytics, Mobile and Ubiquitous

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Distance Learning C...   SPSS Syntax   Databases | Library...   Graduate School N...   Scholarship at the...   Pandemic Continge...

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Clarivate Analytics

Results Analysis
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Research Areas

Grant Numbers

Visualization **Treemap** ▼   Number of results **10** ▼   ⬇ Download   Hide

57 OPEN UNIVERSITY UK	**44** ATHABASCA UNIVERSITY
	42 UNIVERSITY OF EDINBURGH

37 COMPLUTENSE UNIVERSITY OF MADRID
35 UNIVERSITY OF SOUTH AUSTRALIA
34 UNIVERSITY OF SYDNEY

53 UNIVERSIDAD CARLOS III DE MADRID

38 OPEN UNIVERSITY NETHERLANDS

33 UNIVERSITY OF LONDON
30 KYUSHU UNIVERSITY

Sort by **Record count** ▼   Show **25** ▼   Minimum record count 1   Update   ⓘ How are these totals calculated?

Select records to view, or exclude. Choose "View records" to view the selected records only or "Exclude records" to view the unselected records only.

Select	Field: Organizations-Enhanced	Record Count	% of 2,400	Bar Chart
☐	OPEN UNIVERSITY UK	57	2.375 %	I

"In the UK the Open University (OU) is a **world leader** in the collection, intelligent analysis and use of large scale student analytics. It provides academic staff with systematic and high quality actionable analytics for student, academic and institutional benefit (Rienties, Nguyen, Holmes, Reedy, 2017). Rienties and Toetenel's, 2016 study (Rienties & Toetenel, 2016) identifies the importance of the linkage between LA outcomes, student satisfaction, retention and module learning design. These analytics are often provided through **dashboards tailored for each of academics and students** (Schwendimann et al., 2017).

The OU's **world-class Analytics4Action initiative** (Rienties, Boroowa, Cross, Farrington-Flint et al., 2016) supports the university-wide approach to LA. In particular, the initiative provided valuable insights into the identification of students and modules where interventions would be beneficial, analysing over 90 large-scale modules over a two-year period…

The deployment of LA establishes the **need and opportunity for student and module interventions** (Clow, 2012). The study concludes that the faster the feedback loop to students, the more effective the outcomes. This is often an iterative process allowing institutions to understand and address systematic issues.

Legal, ethical and moral considerations in the deployment of LA and interventions are key challenges to institutions. They include informed consent, transparency to students, the right to challenge the accuracy of data and resulting analyses and prior consent to intervention processes and their execution (Slade & Tait, 2019)"

Title/Abstract matches ""learning

Not secure | oro.open.ac.uk/cgi/search/archive/simple?screen=Search&dataset=archive&meta_merge=ALL&meta="learning+analytics"&person_merge=...

Distance Learning C...   SPSS Syntax   Databases | Library...   Graduate School N...   Scholarship at the...   Pandemic Continge...

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Accessibility   A A A A

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Title/Abstract matches ""learning analytics""

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➕ **Embed as feed**

1. Nguyen, Quan; Rienties, Bart and Richardson, John T. E. (2020). Learning analytics to uncover inequality in behavioural engagement and academic attainment in a distance learning setting. *Assessment & Evaluation in Higher Education*, 45(4) pp. 594–606.

2. Rodriguez León, Lucy Jane (2020). *Literacy Experiences: An Exploration Of Young Children's Orientations, Identities, And Affective Relations With Text.* PhD thesis. The Open University.
+1 more...

3. Nguyen, Quan (2020). *Unravelling the Temporal Process of Learning Design and Student Engagement in Distance Education using Learning Analytics.* PhD thesis. The Open University.
+1 more...

Froehlich, Dominik E.; Rehm, Martin and Rienties, Bart Carola (2020). *Mixed Methods*

http://oro.open.ac.uk/

The Open University

Leading global distance learning, delivering high-quality education to anyone, anywhere, anytime

Largest University in Europe

38% of part-time undergraduates taught by OU in UK

173,927 formal students

No formal entry requirements

33% enter with one A-level or less

55% of students are 'disadvantaged'

66% of new undergraduates are 25+

60% FTSE 100 have sponsored staff on OU courses in 2017/8

1 in 8 Open University students has a disability (23,630)

3 in 4 Students are already in work

1,300 employers use OU learning solutions to develop workforce

A special thanks to Vaclav Bayer, Avinash Boroowa, Shi-Min Chua, Simon Cross, Doug Clow, Chris Edwards, Rebecca Ferguson, Mark Gaved, Christothea Herodotou, Martin Hlosta, Wayne Holmes, Garron Hillaire, Simon Knight, Nai Li, Vicky Marsh, Kevin Mayles, Jenna Mittelmeier, Vicky Murphy, Mark Nichols, Quan Nguygen, Tom Olney, Lynda Prescott, John Richardson, Saman Rizvi, Jekaterina Rogaten, Matt Schencks, Mike Sharples, Dirk Tempelaar, Belinda Tynan, Lisette Toetenel, Thomas Ullmann, Denise Whitelock, Zdenek Zdrahal, and others…

What have I learned in six years at the OU

Change is slow, but can be enhanced with:

1. Clear senior management support
2. Bottom-up support from teachers and researchers who are willing to take a risk
3. Evidence-based research can gradually change perspectives and narratives
4. You quickly forget about the small/medium/large successes and fail to realise that you are making a real impact
5. Large-scale innovation takes substantial time and effort
6. It is all about people…

iet

Magic of learning design (does not come easy)

AECT

ORIGINAL PAPER

Check for updates

Learning Design: European Approaches

Barbara Wasson[1] · Paul A. Kirschner[2]

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Abstract

Research on instructional and learning design is 'booming' in Europe, although there has been a move from a focus on content and the way to present it in a formal educational context (i.e., instruction), to a focus on complex learning, learning environments including the workplace, and access to learner data available in these environments. We even see the term 'learning experience design' (Neelen and Kirschner 2020) to describe the field. Furthermore, there is an effort to empower teachers (and even students) as designers of learning (including environments and new pedagogies), and to support their reflection on their own practice as part of their professional development (Hansen and Wasson 2016;

Fig. 7 Teacher-led design inquiry of learning and innovation cycle (Wasson et al. 2016)
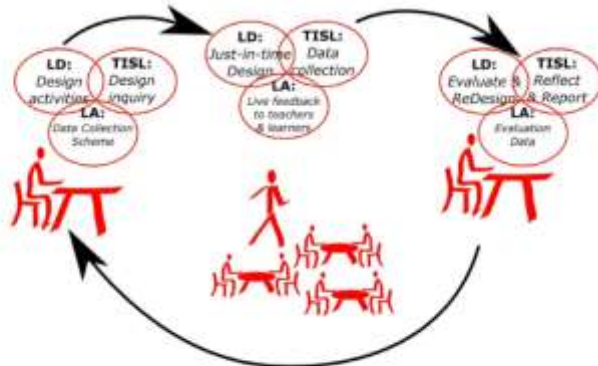
"Research on **the relationship between learning design and learning analytics** has also been a focus in European research in recent years. For example, in their research at **the Open University UK**, Toetenel and Rienties combine learning design and learning analytics where learning design provides context to empirical data about OU courses enabling the learning analytics to give insight into learning design decisions. **This research is important as it attempts to close the virtuous cycle between learning design to improve courses and enhancing the quality of learning, something that has been lacking in the research literature**. For example, they study the impact of learning design on pedagogical decision-making and on future course design, and the relationship between learning design and student behaviour and outcomes (Toetenel and Rienties 2016; Rienties and Toetenel 2016; Rienties et al. 2015)."

Wasson, B., & Kirschner, P. A. (2020). Learning Design: European Approaches. *TechTrends*, 1-13.

2.2 The SLeD architecture and system

McAndrew, P., Nadolski, R. and Little, A., 2005. Developing an approach for Learning Design Players. Journal of Interactive Media in Education, 2005(1), p.Art. 15. DOI: http://doi.org/10.5334/2005-14

Rienties, B., Nguyen, Q., Holmes, W., Reedy, K. (2017). A review of ten years of implementation and research in aligning learning design with learning

Open University Learning Design Initiative (OULDI)

	Assimilative	Finding and handling information	Communication	Productive	Experiential	Interactive/ Adaptive	Assessment
Type of activity	Attending to information	Searching for and processing information	Discussing module related content with at least one other person (student or tutor)	Actively constructing an artefact	Applying learning in a real-world setting	Applying learning in a simulated setting	All forms of assessment, whether continuous, end of module, or formative (assessment for learning)
Examples of activity	Read, Watch, Listen, Think about, Access, Observe, Review, Study	List, Analyse, Collate, Plot, Find, Discover, Access, Use, Gather, Order, Classify, Select, Assess, Manipulate	Communicate, Debate, Discuss, Argue, Share, Report, Collaborate, Present, Describe, Question	Create, Build, Make, Design, Construct, Contribute, Complete, Produce, Write, Draw, Refine, Compose, Synthesise, Remix	Practice, Apply, Mimic, Experience, Explore, Investigate, Perform, Engage	Explore, Experiment, Trial, Improve, Model, Simulate	Write, Present, Report, Demonstrate, Critique

Conole, G. (2012). *Designing for Learning in an Open World*. Dordrecht: Springer.
Rienties, B., 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 (2016), 333-341
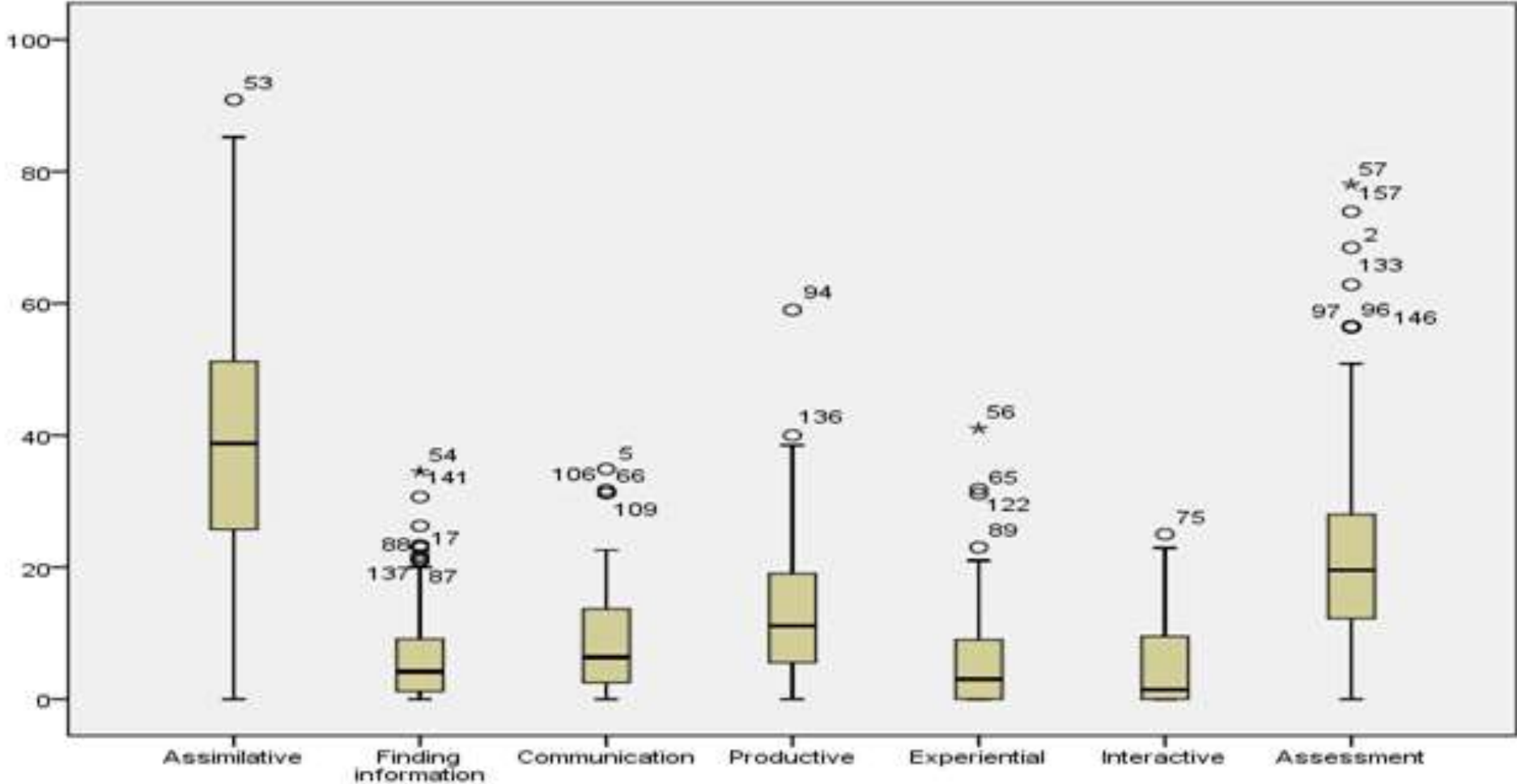
Toetenel, L., Rienties, B. (2016). Analysing 157 Learning Designs using Learning Analytic approaches as a means to evaluate the impact of pedagogical decision-making. *British Journal of Educational Technology, 47*(5), 981–992.

Edit module - Learning ×

← → C ⌂ ① learning-design.open.ac.uk/module/176/edit

Apps   For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...

Module Summary | →| Learning Outcomes | ilı Activity Planner | ⚠ Workload Tool | ▦ Module Map | ▭ Design Log | ☑ Evaluation

Hours spent undertaking each type of activity

Design stages

Initial	Specification (REP03)	Draft (D2)	Final

Copy and replace:

Initial → Specification		Specification → Draft		Draft → Final
Workload tool → Initial	Workload tool → Specification	Workload tool → Draft		Workload tool → Final

Total hours
Avg: 12.16, StDv: 6.28   Hide guides
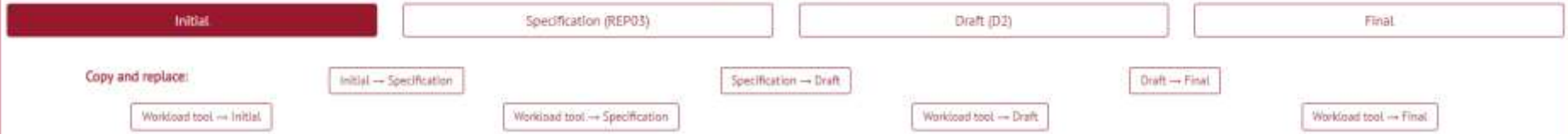
Week		Assimilative		Finding and handling information		Communication		Productive		Experiential		Interactive / Adaptive		Assessment		Total hours
Week 1	➡	10	✎	1.5	✎	1	✎	0.6	✎	0	✎	0	✎	0.2	✎	13.30
Week 2	➡	6.1	✎	0	✎	0.5	✎	0.6	✎	2	✎	0	✎	6.2	✎	15.40
Week 3	➡	6.1	✎	0	✎	0	✎	2.2	✎	2.85	✎	0	✎	3.5	✎	14.65
Week 4	➡	0	✎	0	✎	0	✎	0	✎	0	✎	0	✎	0	✎	0
Week 5	➡	5.8	✎	0	✎	0	✎	0	✎	19.1	✎	0	✎	10.9	✎	35.85
Week 6	➡	13.5	✎	0	✎	0	✎	3.55	✎	4.3	✎	0	✎	1.8	✎	23.15
Week 7	➡	7.25	✎	0.4	✎	0	✎	1	✎	0.7	✎	0	✎	3.3	✎	12.65
Week 8	➡	5.79	✎	0	✎	0	✎	0	✎	0	✎	0	✎	9.3	✎	15.09
Week 9	➡	10.5	✎	0	✎	0	✎	3	✎	0.1	✎	0	✎	2.5	✎	16.16
Week 10	➡	6.31	✎	0	✎	0.5	✎	0.35	✎	0.7	✎	0	✎	2.65	✎	10.51
Week 11	➡	7.46	✎	4	✎	0	✎	2.1	✎	0	✎	0	✎	3.2	✎	16.76
Week 12	➡	5.69	✎	0	✎	0	✎	1.3	✎	0.35	✎	0.5	✎	1.8	✎	9.64
Week 13	➡	7.43	✎	0.65	✎	0	✎	2.8	✎	0.6	✎	0	✎	1.6	✎	13.08

Merging big data sets

- Learning design data (>300 modules mapped)
- VLE data
    - >140 modules aggregated individual data weekly
    - >37 modules individual fine-grained data daily
- Student feedback data (>140)
- Academic Performance (>140)
- Predictive analytics data (>40)
- Data sets merged and cleaned
    - 111,256 students undertook these modules

iet

69% of what students are doing in a week is determined by us, teachers!
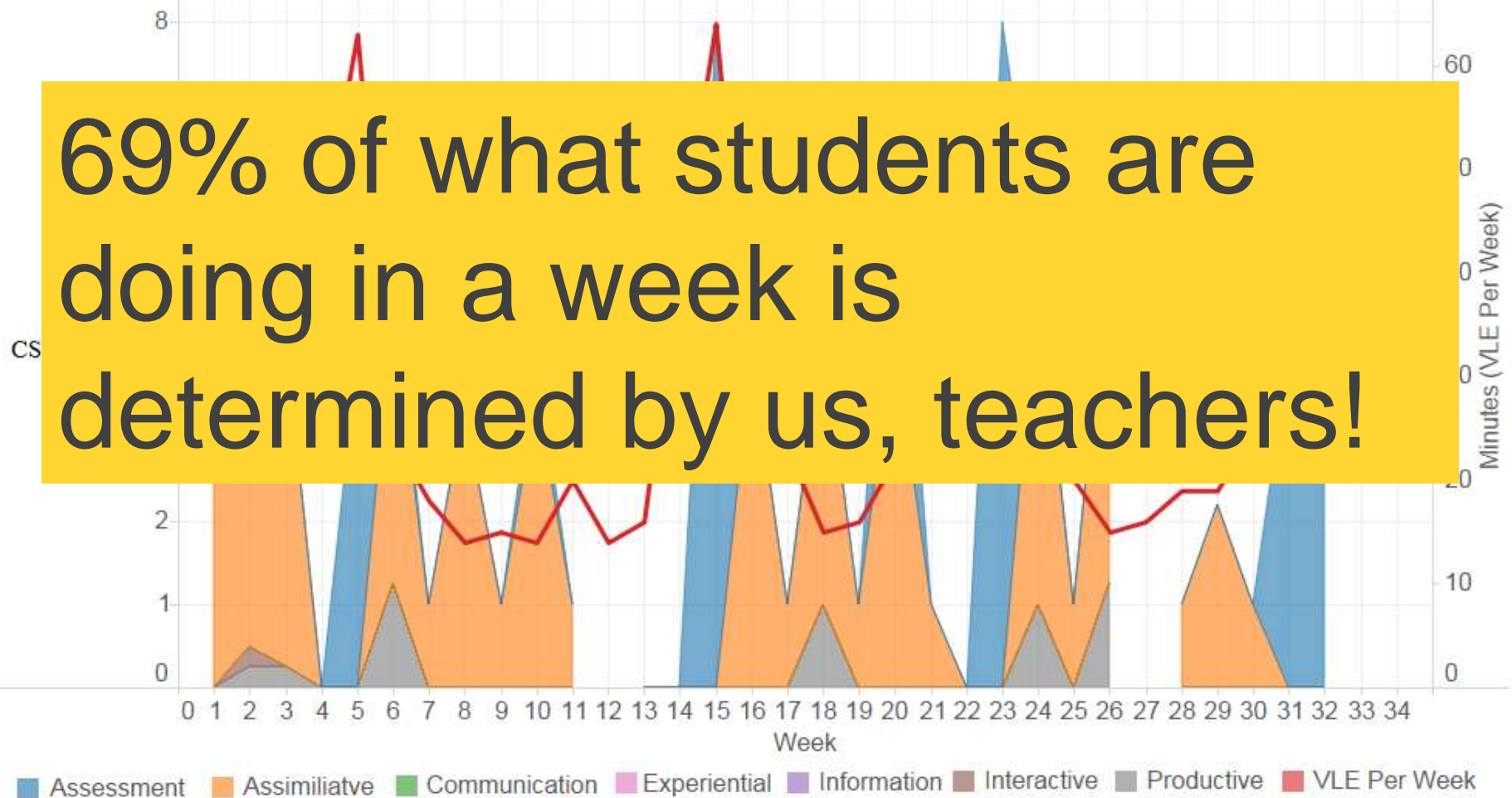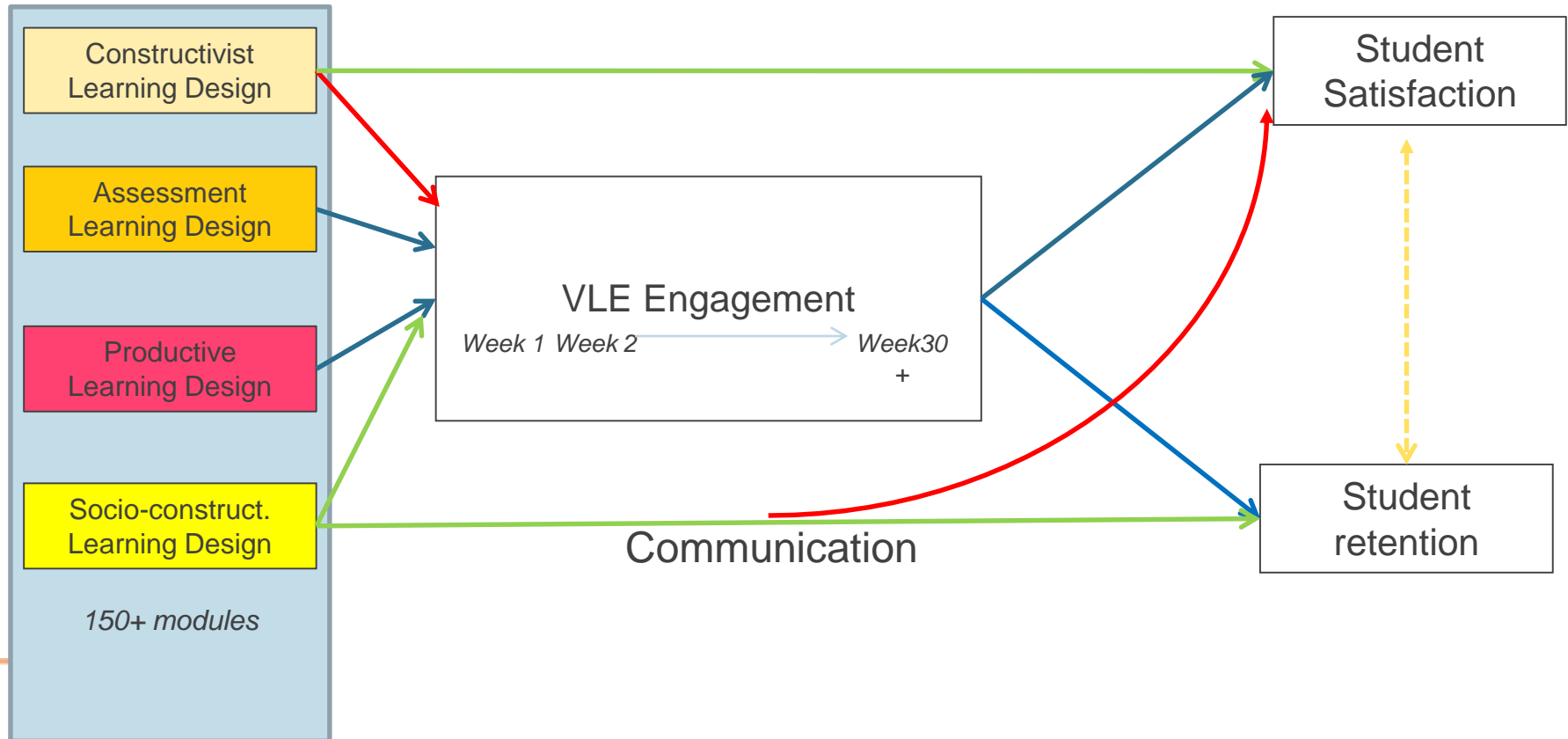
Nguyen, Q., Rienties, B., Toetenel, L., Ferguson, R., Whitelock, D. (2017). Examining the designs of computer-based assessment and its impact on student engagement, satisfaction, and pass rates. *Computers in Human Behavior*. DOI: 10.1016/j.chb.2017.03.028.

Rienties, B., 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 (2016), 333-341

Nguyen, Q., Rienties, B., Toetenel, L., Ferguson, R., Whitelock, D. (2017). Examining the designs of computer-based assessment and its impact on student engagement, satisfaction, and pass rates. *Computers in Human Behavior*. DOI: 10.1016/j.chb.2017.03.028.

Learning Design

About

Blog

Processes

Tools

> **Activity Planner Categories**

> Online Learning Design Tool

> The ICEBERG Model

> Qualification Design Tools

> Module Design Tools

> Block Design Tools

> Activity Design Tools

Analytics and Evaluation

Scholarship and Research

Partnerships

Training and Support

Activity Planner Categories

The Activity Planner categories represent different types of activities that students can engage with in the course of a module, each providing a distinct set of pedagogical benefits. Here you will find some explanations of each category and the type of activities that fall within it.

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Assimilative

Attending to information

Students study and think about theories and concepts encountered in materials and resources, case studies, etc.

Often the first part of a learning cycle where students receive and begin to make sense of new information, before they then apply or test their new knowledge, or go on to reflect, review and communicate their understanding.

Read, Watch, Listen, Think about, Access, Observe, Review, Consider, Study

Finding and Handling information

Searching for and processing information

Students are actively and critically engaged in gathering and manipulating information.

Predictive analytics and professional development

Kuzilek, J., Hlosta, M., Herrmannova, D., Zdrahal, Z., & Wolff, A. (2015). OU Analyse: analysing at-risk students at The Open University LACE Learning Analytics Review (Vol. LAK15-1). Milton Keynes: Open University.
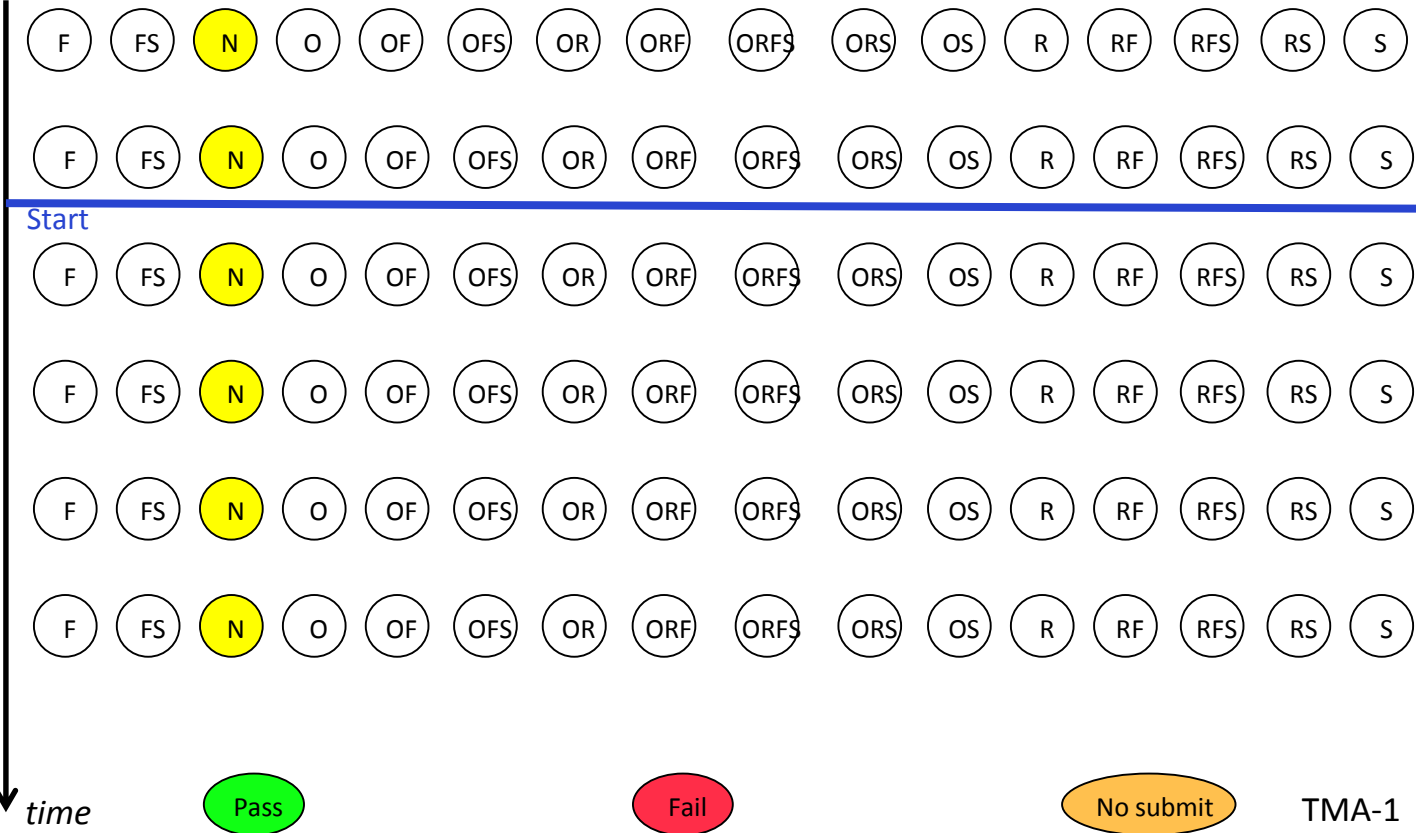Kuzilek, J., Hlosta, M., & Zdrahal, Z. (2017). Open University Learning Analytics dataset. Scientific Data, 4, 170171. doi: 10.1038/sdata.2017.171
Wolff, A., Zdrahal, Z., Herrmannova, D., Kuzilek, J., & Hlosta, M. (2014). Developing predictive models for early detection of at-risk students on distance learning modules, Workshop: Machine Learning and Learning Analytics
Paper presented at the Learning Analytics and Knowledge (2014), Indianapolis.
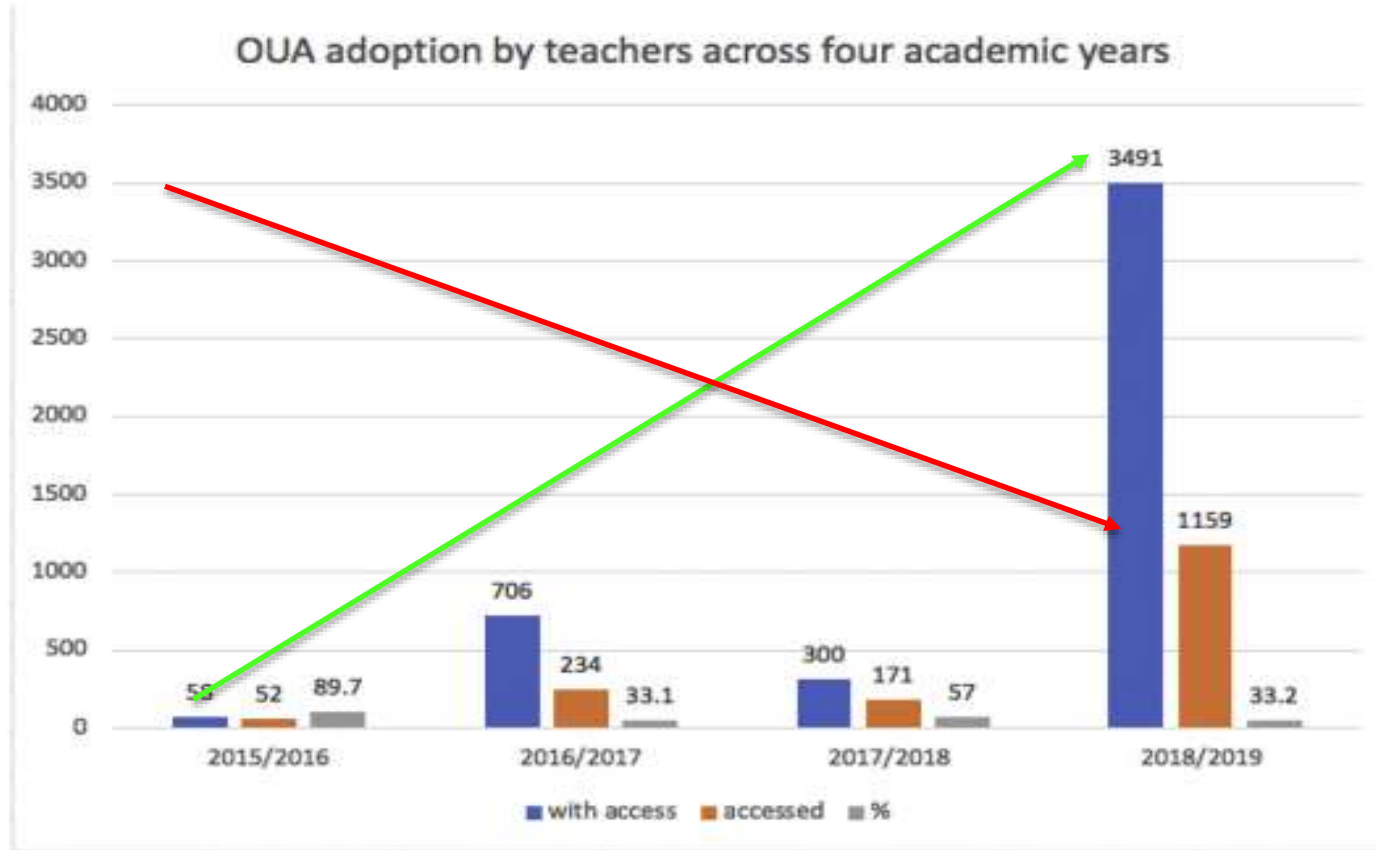
Activity space

Start

VLE opens

F FS **N** O OF OFS OR ORF ORFS ORS OS R RF RFS RS S

F FS **N** O OF OFS OR ORF ORFS ORS OS R RF RFS RS S

Start

F FS **N** O OF OFS OR ORF ORFS ORS OS R RF RFS RS S

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time

Pass

Fail

No submit

TMA-1

VLE trail: successful student

TMA-1

VLE trail: student who did not submit

OU Analyse demo

Fig. 2. OUA adoption by teachers during the last 4 academic years.

Herodotou, C., Rienties, B., Hlosta, M., Boroowa, A., Mangafa, C., Zdrahal, Z., (2020). Scalable implementation of predictive learning analytics at a distance learning university: Insights from a longitudinal case study. *Internet and Higher Education, 45,* 100725.
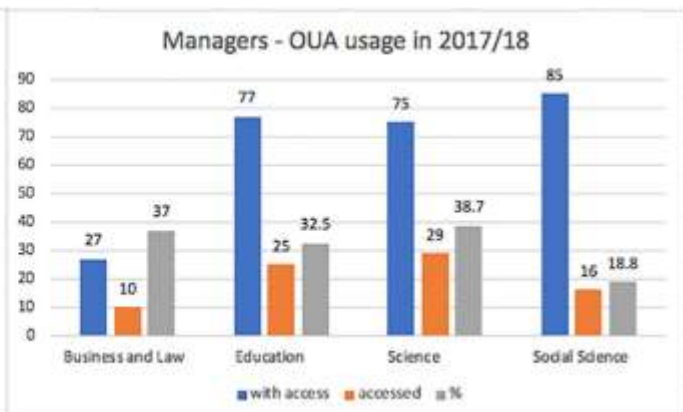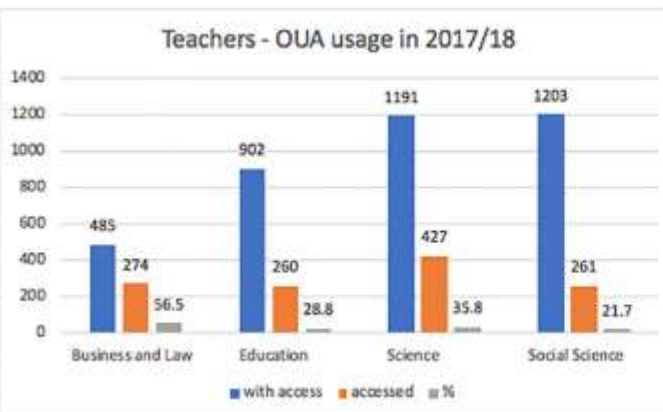
2015/16
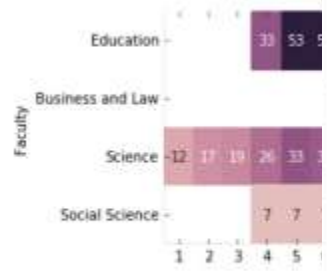
Fig. 3. Percentage

2016/17

Fig. 4. Percentage

Teachers - OUA usage in 2017/18
Managers - OUA usage in 2017/18
Course Chairs- OUA usage in 2017/18
All Staff - OUA access in 2017/18

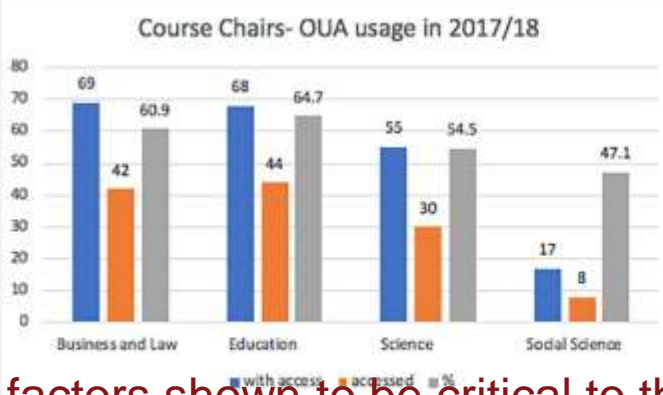with access   accessed   %

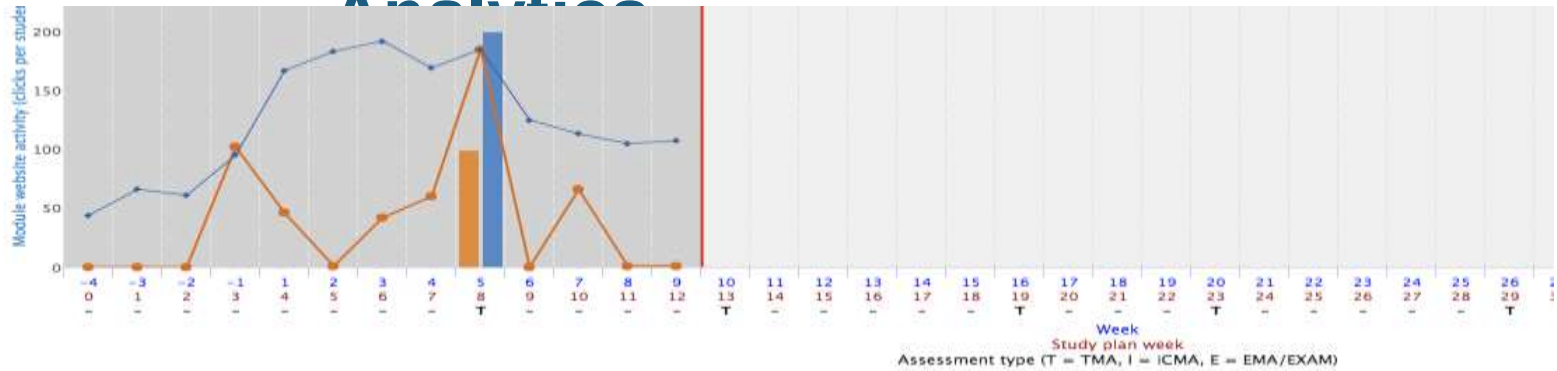Fig. 7. Staff usage of OUA in 2018/19 across four faculties.
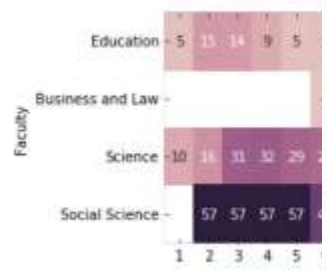
- Amongst the factors shown to be critical to the scalable PLA implementation were: Faculty's engagement with OUA, teachers as "champions", evidence generation and dissemination, digital literacy, and conceptions about teaching online.

Herodotou, C., Rienties, B., Hlosta, M., Boroowa, A., Mangafa, C., Zdrahal, Z., (2020). Scalable implementation of predictive learning analytics at a distance learning university: Insights from a longitudinal case study. *Internet and Higher Education, 45,* 100725.

Student Facing Analytics

What do practitioners want and where should distance learning institutions be going?

The Open University

Design

Design

Inquiry

First Module

2nd Module

Nth Module

Design

Life long learning

Qualification

Rienties, B., Olney, T., Nichols, M., Herodotou, C. (2020). Effective usage of Learning Analytics: What do practitioners want and where should distance learning institutions be going? *Open Learning, 35*(2)*, 178-195*
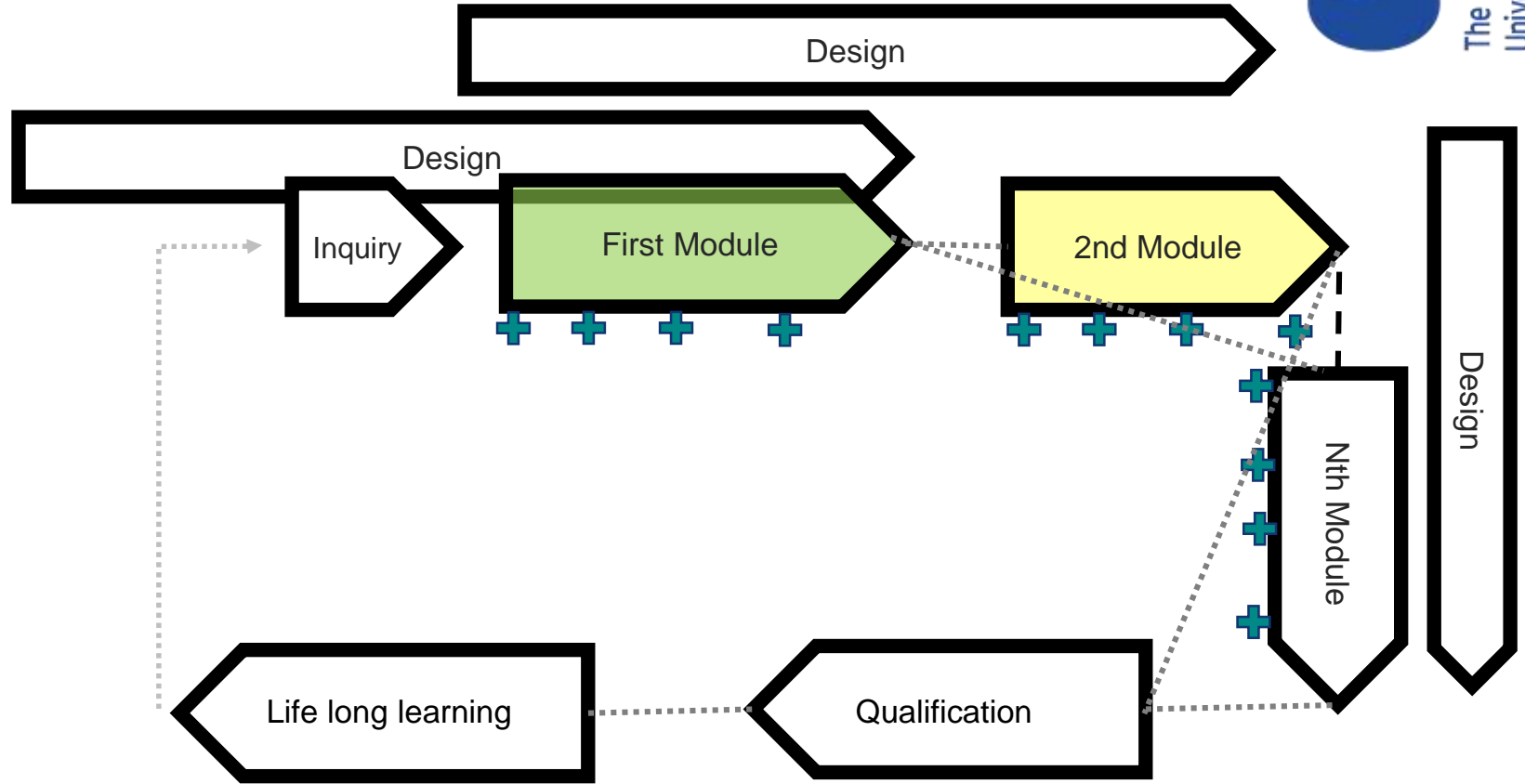
ORGANISATIONAL CAPABILTIES

The Open University

Design → Inquiry → First Module → 2nd Module → Nth Module
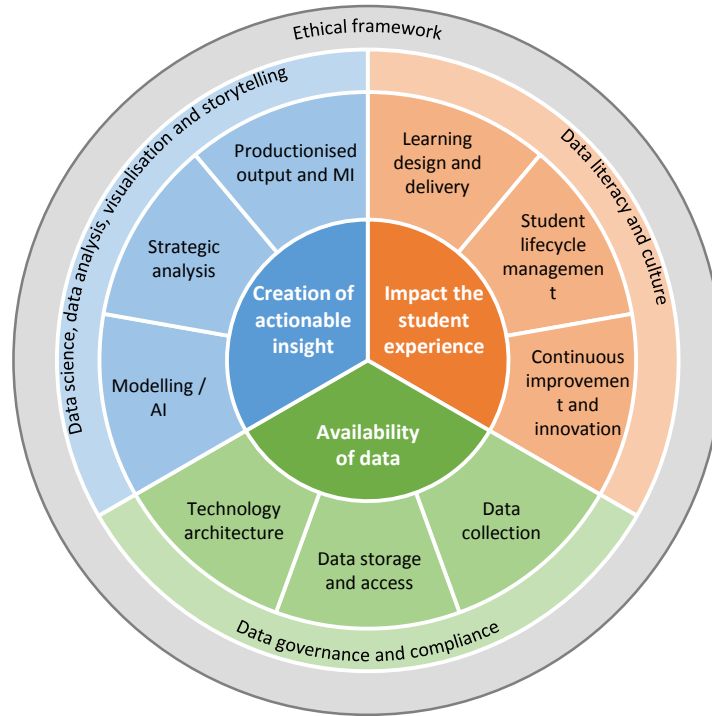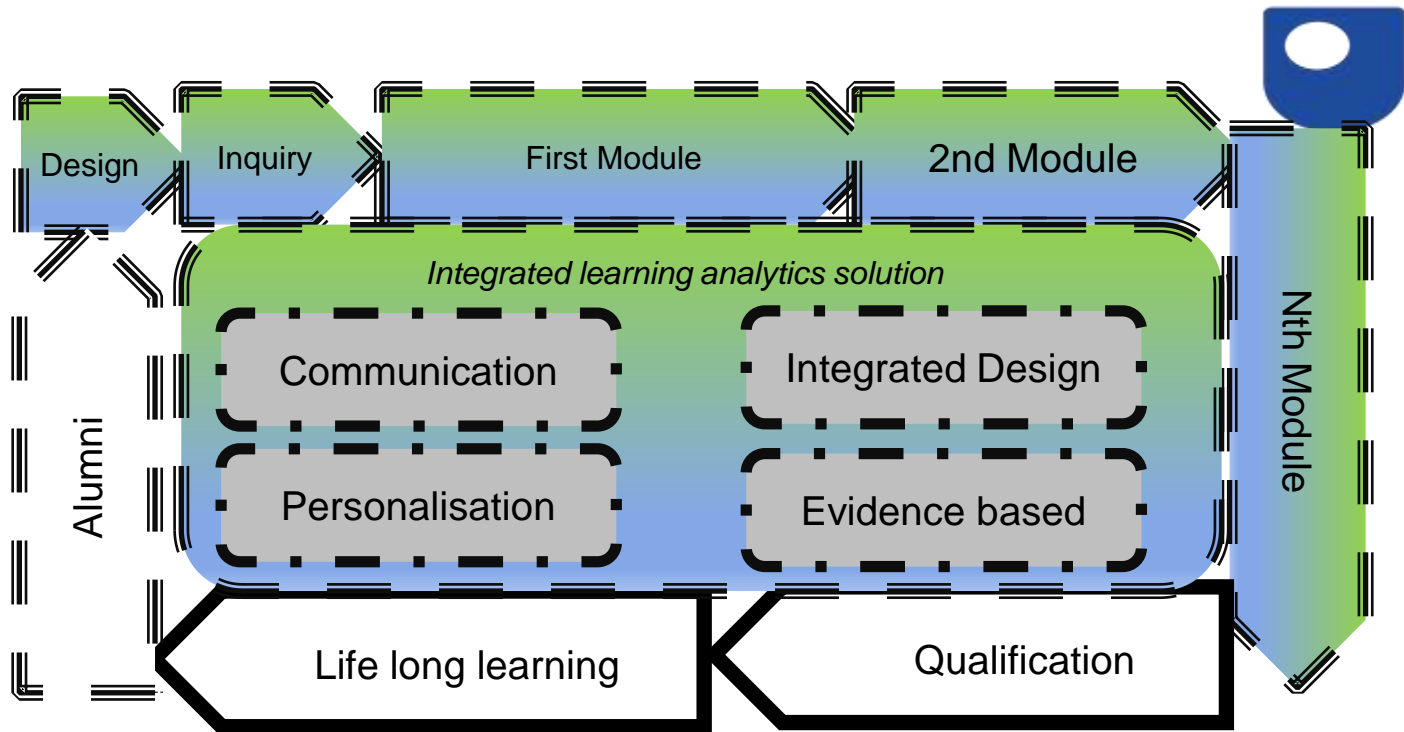
Alumni

Integrated learning analytics solution

Communication

Integrated Design

Personalisation

Evidence based

Life long learning

Qualification

Rienties, B., Olney, T., Nichols, M., Herodotou, C. (2020). Effective usage of Learning Analytics: What do practitioners want and where should distance learning institutions be going? *Open Learning, 35*(2)*, 178-195*

What have I learned in six years at the OU

Change is slow, but can be enhanced with:

1. Clear senior management support
2. Bottom-up support from teachers and researchers who are willing to take a risk
3. Evidence-based research can gradually change perspectives and narratives
4. You quickly forget about the small/medium/large successes and fail to realise that you are making a real impact
5. Large-scale innovation takes substantial time and effort
6. It is all about people…

iet

Further reflections

1. What about the ethics?
2. What about professional development?
3. Are we optimising the record player?

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E: bart.rienties@open.ac.uk
W: www.bartrienties.nl
W: https://www.organdonation.nhs.uk/
W: https://www.sportentransplantatie.nl/