



The Open
University



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All papers referred to in this presentation can be
accessed via

<https://iet.open.ac.uk/people/bart.rienties>



Implementing learning analytics and learning design at scale: Lessons from the Open University UK



iLed

Innovating Learning Design
in Higher Education

My aims with you today

1. How the number of student enrolments in Open University, UK, has changed before/during/after COVID-19?
2. How learning analytics has become important during/after COVID-19?
3. Research trends and future directions of learning analytics research



The Open University

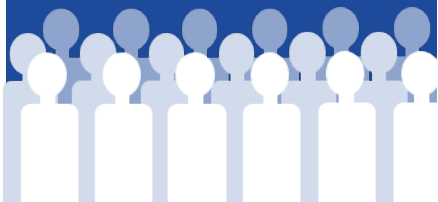
Leading global distance learning, delivering high-quality education to anyone, anywhere, anytime



Largest
University
in Europe

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

196,131 formal
students



No formal
entry
requirements



33%
enter with one
A-level or less

55%

of students are
'disadvantaged'

66% ²⁵

of new
undergraduates
are 25+

60%

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

1 in 4

Open University students
has a disability (50,408)



3 in 4

Students are
already in work



1,300

employers use
OU learning
solutions to
develop
workforce



Institutional Performance Pairwise Comparison

Declared disability v No disability

Data last updated
27/01/2024

Presentation: All | Select a characteristic: Disability | Select a pairwise comparison: Declared disability v No dis... | UG/PG: Undergraduate | Microcredential: All

Select a measure

- 1. % Registered at start
- 2. % Registered at 25% FLP
- 3. Start to 25% FLP
- 4. TMA01 Submission rate
- 5. Completion rate
- 6. Pass rate
- 7. Good pass rate
- 8. Return rate
- 9. Complete to pass rate

Measure Key

Measure 1	Measure 2
Declared Disability	No Disability

Nation: All

Access route students: All

Credit transfer students: All

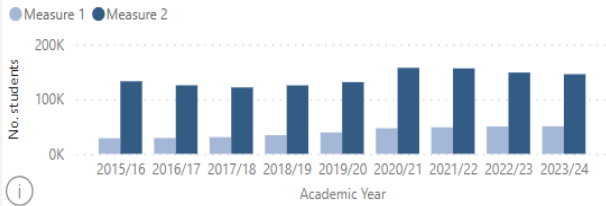
New or Continuing: All

Study intensity: All

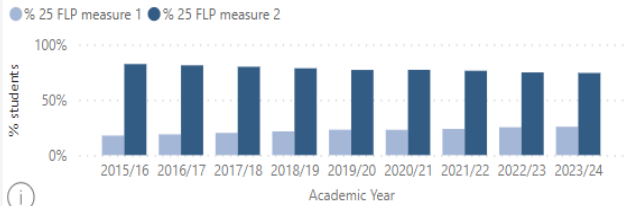
Module Level: All

Recruitment trends

Volume registered at 25% FLP

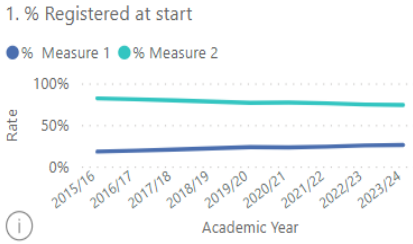


Proportion registered at 25% FLP

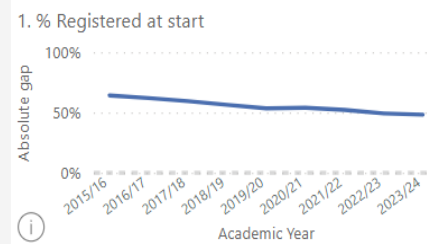


Awarding gap trends

Measure trend by demographic



Awarding gap trend



Performance against Target - Pending

- Module metric student profile demographic
- Institutional
- Institutional KPI
- Student Group Overview
- Pairwise Performance
- Institutional APS Monito...
- Institutional APP Monitoring
- APP Targets - Access, Su...
- OU Targets
- Faculty
- BOS
- Board of Study KPI
- Student Group Overview
- Pairwise Performance
- Module Gap Comparator
- Institutional APS Monito...
- Module

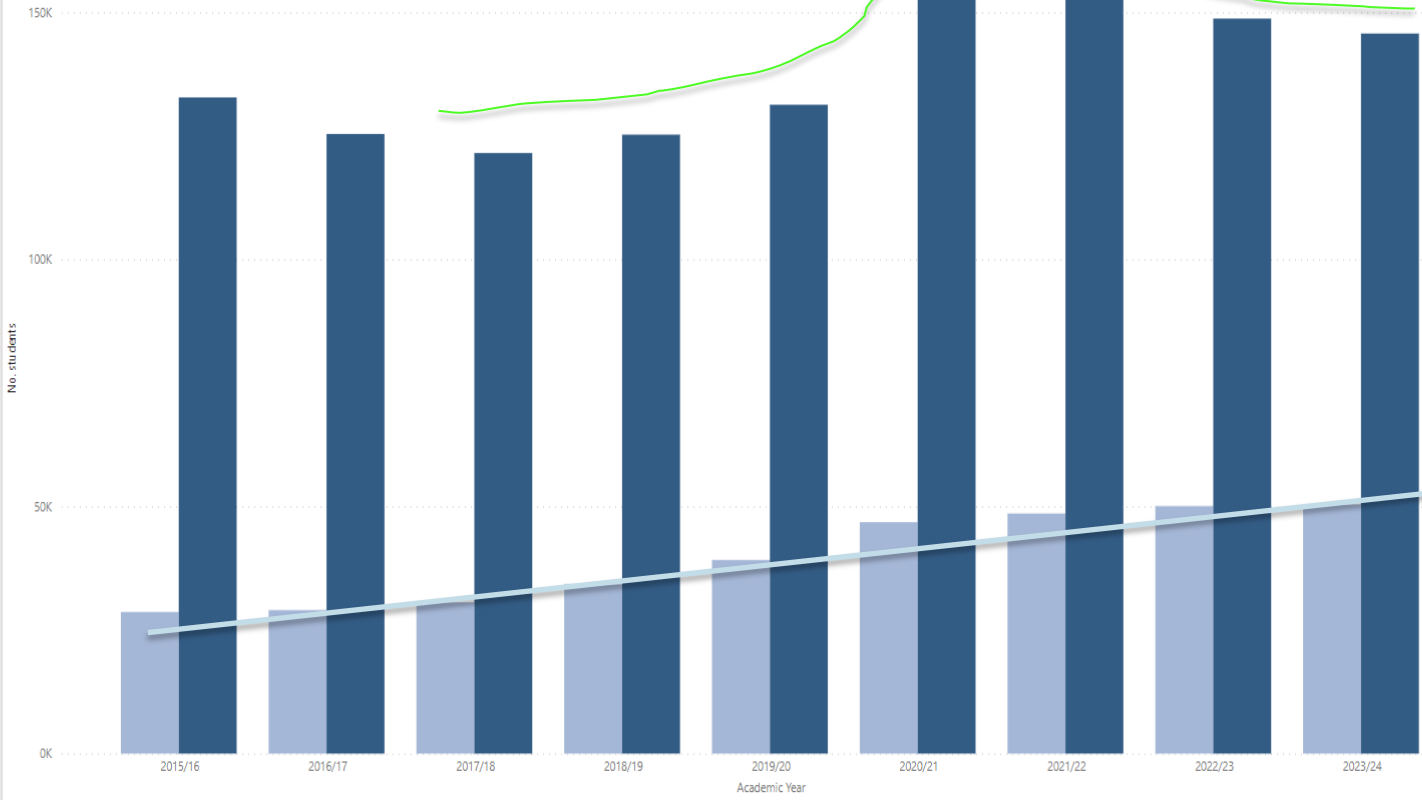
Module metric student profile demographic

- Institutional
- Institutional KPI
- Student Group Overview
- Pairwise Performance**
- Institutional APS Monito...
- Institutional APP Monitoring
- APP Targets - Access, Su...
- OU Targets
- Faculty
- BOS
- Board of Study KPI
- Student Group Overview
- Pairwise Performance
- Module Gap Comparator
- Institutional APS Monito...
- Module

Back to report

VOLUME REGISTERED AT 25% FLP

Measure 1 Measure 2

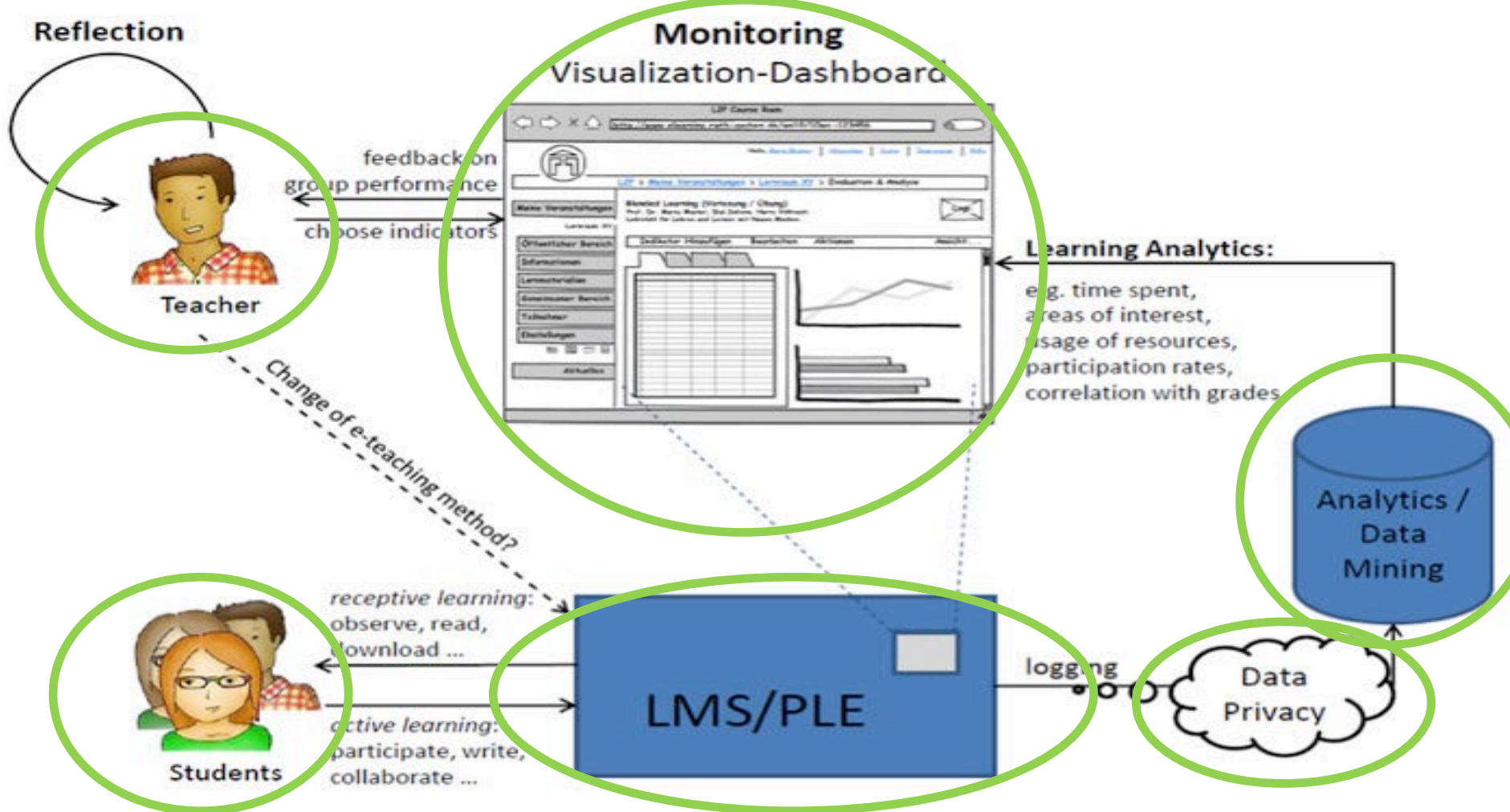


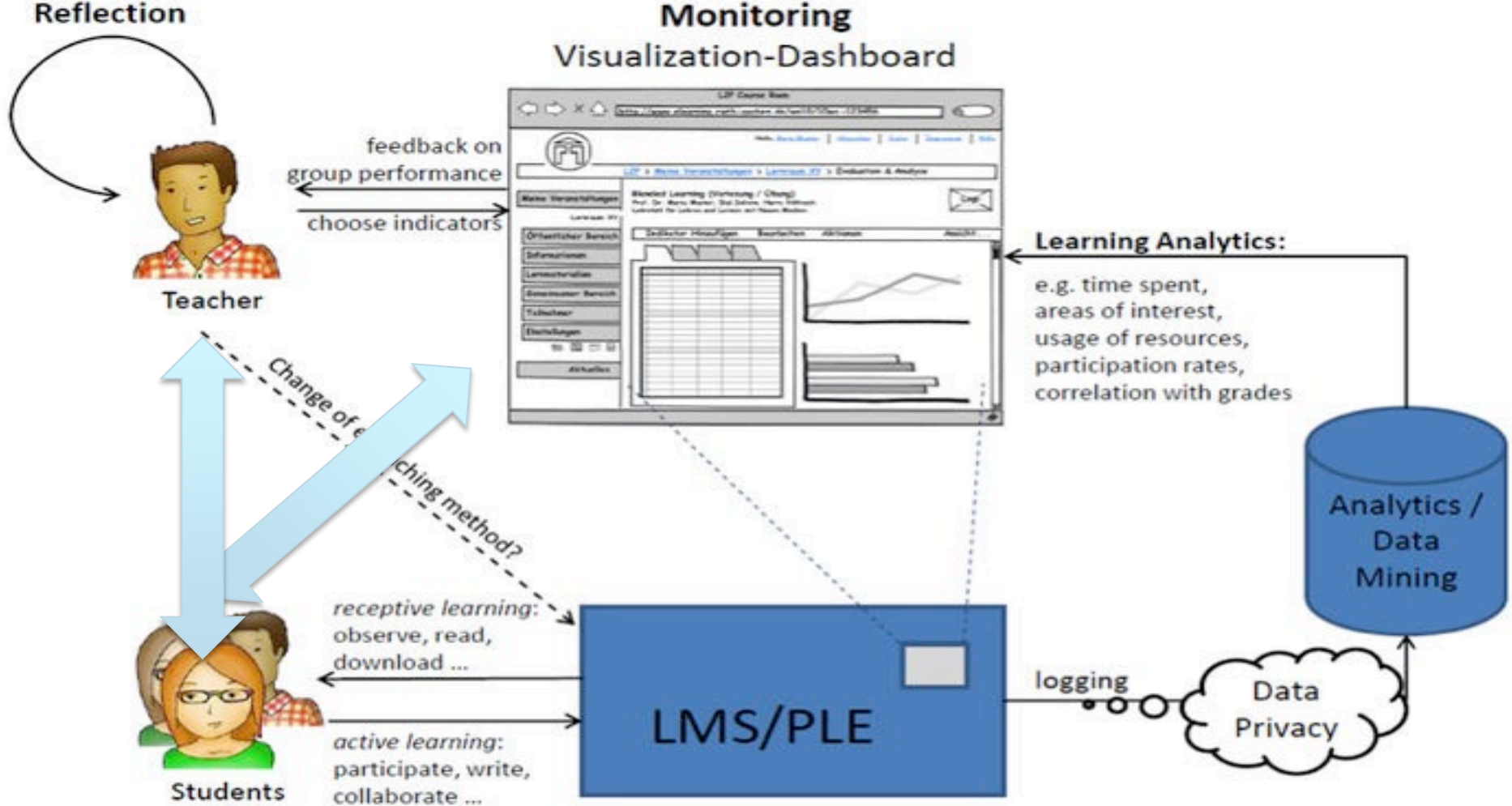
Filters

Search

Filters on this visual

- AV is (All)
- Measure 1 is (All)
- Measure 2 is (All)





What we have learned in 10 years in terms of benefits of LA?

Learners

Enhance engagement of students	Improve learning outcomes
Personalization of learning	Increase in students adaptivity
Enrich personalized learning environments	
Increase self - reflection & self-awareness	
Parents (Monitoring students' activities)	

1. Support access and inclusion
2. EDI

Faculty

Enhance Assessment services	Make efficient interventions
Get a real - time feedback	Get a real - time insight
Understand students learning habits	Modify content for students' desire
Monitoring students' activities	Predicting student performance
Provide warning signal	Improve teaching strategy
Improve instructor performance	Sources recommendation
Get a deeper understand teaching/learning	
Researchers (Increase efficiency Education & serious games, Identify knowledge gaps)	

1. Improved pedagogical awareness
2. Improved data literacy and confidence
3. Driver for change based upon evidence

Institutions

Identifying target course
Improve learning design

1. Identify good practice/teachers/modules
2. Alignments between modules/qualifications
3. Indications of good practice between/across institutions

Case-studies included from Arizona State University (USA), Dublin City University (IRE), Georgia State University (USA), Northern Arizona University (USA), New York Institute of Technology (USA), **The Open University (UK)**, Open Universities Australia (AUS), Purdue University (USA), Rio Salado College (USA), Sinclair Community College (USA), Tecnológico de Monterrey (Mex), University of Alabama (USA), University in Ankara (TUR), University of Maryland (USA), University of Michigan (USA), University of Wollongong (AUS)

What we have learned in 10 years in terms of challenges of LA?

1 **Ethics and privacy.** Various questions arise here, e.g., who has access to the data and personal information, how long it is kept, how much data is safe and who owns the data.

2 **Scope and quality of data.** Questions that arise include how much data should be collected, how much data should have variety, what type of data has value for learning and how much reliable predictions can be made.

3 **Theoretical and educational foundations.** There is a lack of attention to learning and teaching theories. *LA* should be based on pedagogical and epistemological assumptions.

4 **Research.** More research is needed to establish the foundations of *LA* (Dollinger & Lodge, 2018).

5 **Practice.** There is a lack of transference of *LA* theory to practice (Dollinger & Lodge, 2018). A user center design methodology as well as include the final user in the design process is needed to develop *LA* systems and applications (Dominguez F et al., 2020).

6 **Institutions.** It is essential to align the points of view of researchers, educators, learners, educational technologists and administrators regarding *LA* (Leitner & Ebner, 2019).

7 **Measurement of impact.** It is well known that *LA* can impact students learning by supporting teaching and learning strategies (Knight, Gibson, & Shibani, 2020).

OU has Ethics LA policy since 2014

Data Governance

Actual adoption and sense making

OU #1 in Europe, #2 in world

Actual adoption and sense making

LA embedded in design and practice

Good evidence within a module, more needed across qualifications and diversity

What we have learned from large scale adoption of predictive learning analytics at the OU (2014-2023)



Predictions

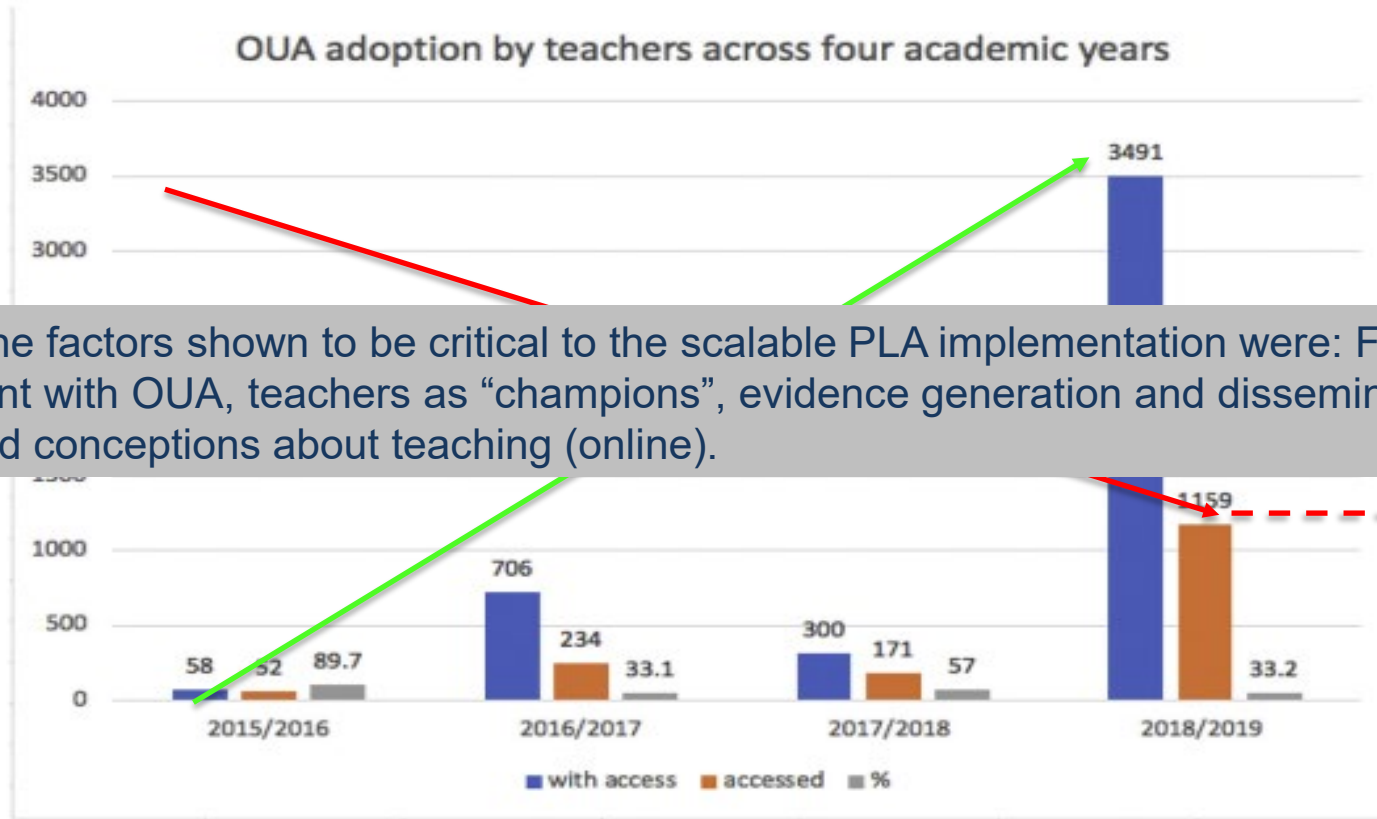
Student Information					Next TMA predictions Generated: 2020/02 (today) Week: 19			Long term predictions Generated: 2020/02 (14 days ago) Week: 13	
Student ID	Name	Tutor PI	Staff tutor PI	TMA	Submission	Risk of NS	Grade	Completion	Passing
A0000000	Freddy Hayes	98167702	81625251	●●●●●●●●	N/A	N/A	N/A	71.80%	51.40%
A0000000	Helen Bestor	91199169	88966557	●●●●●●●●	N/A	N/A	N/A	81.90%	51.40%
A0000000	Arba Dicki	20387629	52955221	●●●●●●●●	N/A	N/A	N/A	95.100%	61.70%
A0000000	Kitty Ulrich	10123672	1202332	●●●●●●●●	N/A	N/A	N/A	71.80%	41.50%
A0000000	Dimitrios Schizas	36019326	12521221	●●●●●●●●	N/A	N/A	N/A	81.90%	81.90%
A0000000	Hilpota Aulbacher	01133225	38197990	●●●●●●●●	N/A	N/A	N/A	00.00%	00.00%
A0000000	Genevieve Hechurst	52012919	78222331	●●●●●●●●	N/A	N/A	N/A	00.00%	00.00%
A0000000	Cornea Fortules	83007917	87258119	●●●●●●●●	N/A	N/A	N/A	95.100%	81.90%
A0000000	Dusty Schiller	59111600	73972385	●●●●●●●●	N/A	N/A	N/A	51.40%	41.50%
A0000000	Gustafage Brinkke	68319368	53887702	●●●●●●●●	N/A	N/A	N/A	00.00%	00.00%
A0000000	Emmy McKeown	62982867	68152571	●●●●●●●●	N/A	N/A	N/A	95.100%	95.100%
A0000000	Ermanur Grant	88181111	62062619	●●●●●●●●	N/A	N/A	N/A	81.90%	71.80%
A0000000	Deven Rath	35511285	76264711	●●●●●●●●	N/A	N/A	N/A	95.100%	95.100%
A0000000	Anne Wehner	28793398	81039211	●●●●●●●●	N/A	N/A	N/A	41.50%	21.20%
A0000000	Arto Wilman	28941389	89102833	●●●●●●●●	N/A	N/A	N/A	71.80%	71.80%
A0000000	Milton Johns	26121760	25722885	●●●●●●●●	N/A	N/A	N/A	41.50%	41.50%
A0000000	Ora Reynolds	69229281	42945229	●●●●●●●●	N/A	N/A	N/A	95.100%	81.90%
A0000000	Karl Daniel	31451427	38294853	●●●●●●●●	N/A	N/A	N/A	N/A	N/A
A0000000	Jasmine Pacey	22223272	79428216	●●●●●●●●	N/A	N/A	N/A	95.100%	81.90%
A0000000	Clara Hingor	62825515	62615228	●●●●●●●●	N/A	N/A	N/A	81.90%	81.90%
A0000000	Katrina Cummings	53899889	25797123	●●●●●●●●	N/A	N/A	N/A	51.40%	21.20%
A0000000	Nicole Gerlach	90178211	31388729	●●●●●●●●	N/A	N/A	N/A	95.100%	95.100%
A0000000	Annabelle Pomeroy	70896074	68395714	●●●●●●●●	N/A	N/A	N/A	95.100%	95.100%
A0000000	Jermine Bernard	21223522	98321381	●●●●●●●●	N/A	N/A	N/A	95.100%	81.90%
A0000000	Ely Johnson	53971752	30728891	●●●●●●●●	N/A	N/A	N/A	95.100%	95.100%

Showing 1 to 25 of 1,315 entries

Kuzilek, J., Hlosta, M., Hermannova, 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.

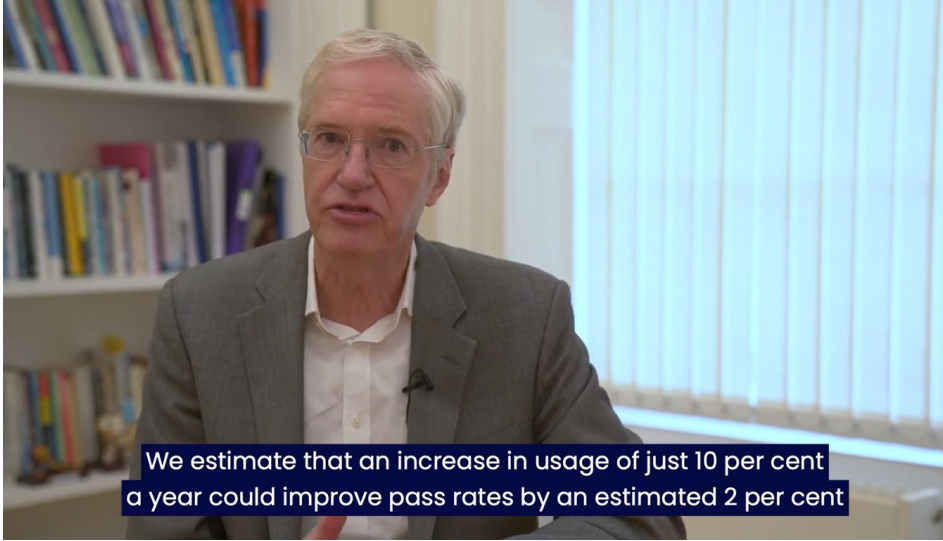
Kuzilek, J., Hlosta, M., & Zdrahal, Z. (2017). Open University Learning Analytics dataset. Scientific Data, 4, 170171. doi: 10.1038/sdata.2017.171

Wolff, A., Zdrahal, Z., Hermannova, 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.

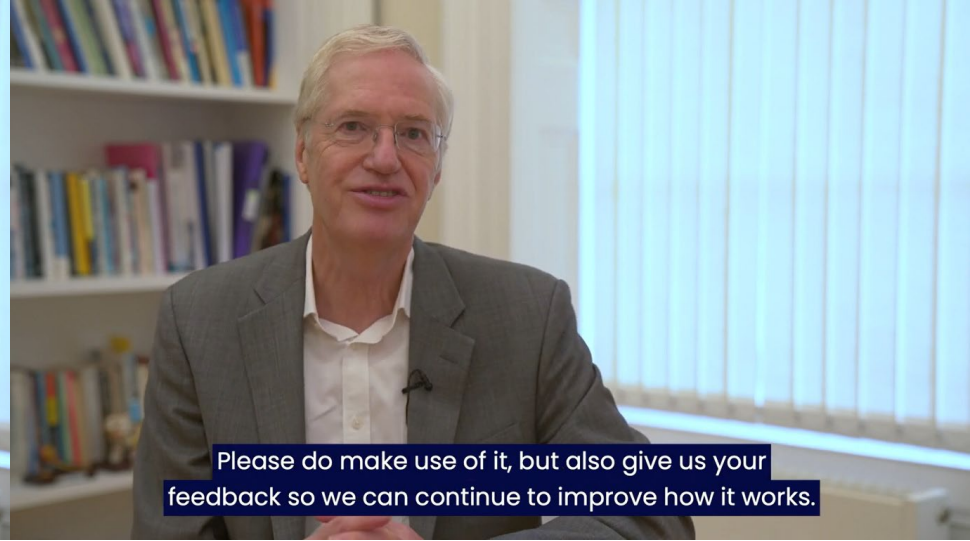


Amongst the factors shown to be critical to the scalable PLA implementation were: Faculty's engagement with OUA, teachers as “champions”, evidence generation and dissemination, digital literacy, and conceptions about teaching (online).

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



We estimate that an increase in usage of just 10 per cent a year could improve pass rates by an estimated 2 per cent

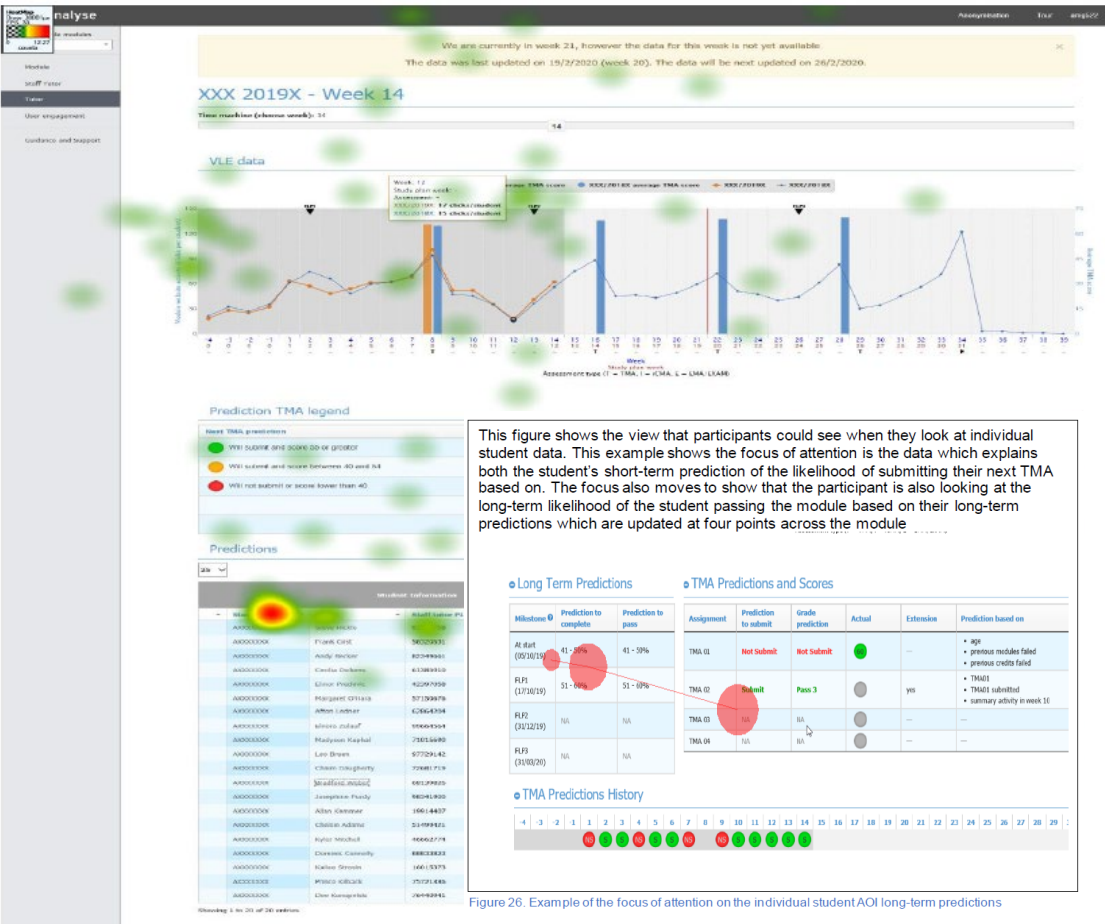


Please do make use of it, but also give us your feedback so we can continue to improve how it works.

Prof Tim Blackman, Vice Chancellor The Open University, 11 November 2022

<https://www.youtube.com/watch?v=Lir6ThLg6bM>

Figure 22. Heat map example of the density of the fixations on stimuli



This figure shows the view that participants could see when they look at individual student data. This example shows the focus of attention is the data which explains both the student's short-term prediction of the likelihood of submitting their next TMA based on. The focus also moves to show that the participant is also looking at the long-term likelihood of the student passing the module based on their long-term predictions which are updated at four points across the module

Figure 26. Example of the focus of attention on the individual student AOI long-term predictions

- Eye-tracking combined with think-aloud protocol of experienced teachers using PLA
- Most teachers comfortable with main dashboard, but worried about ethics/data
- Some erroneous interpretations and sense making of actual data
- Uncertainty about what options to address identified issues

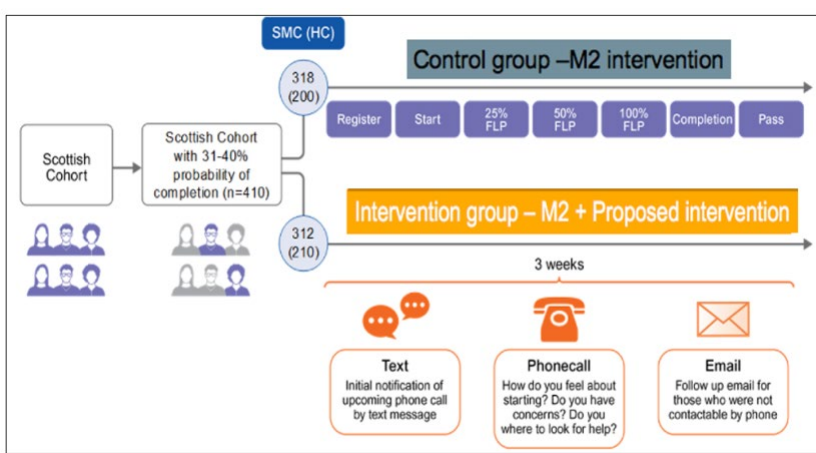


Figure 1. Intervention design to support students with 31–40% probability of course completion.

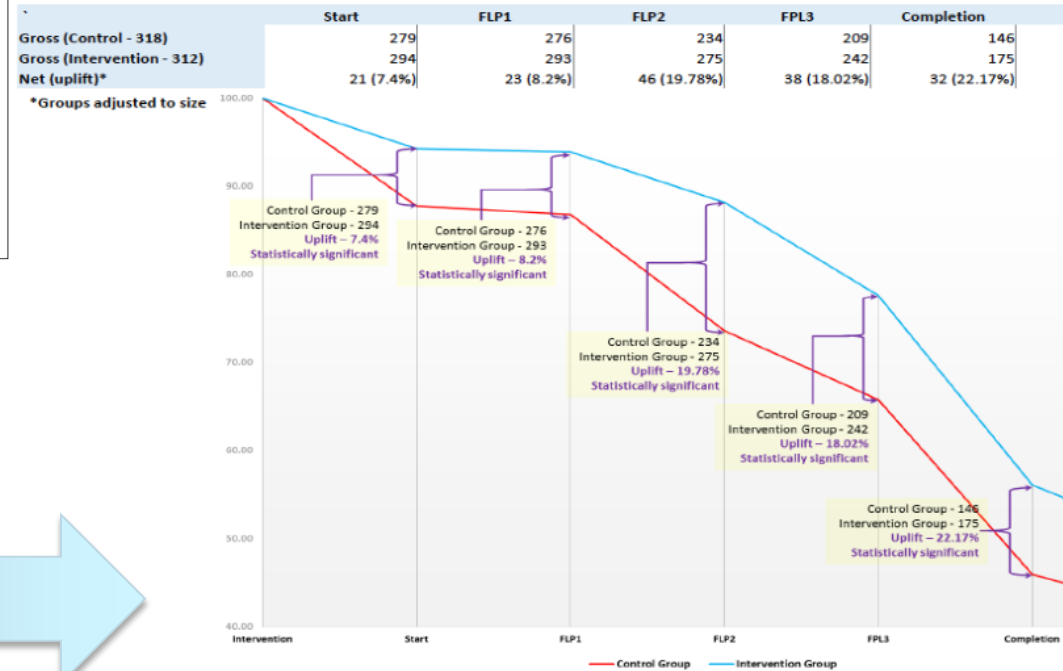


Figure 2. Student retention rates (number of students present) at each course milestone.

Herodotou, C., Naydenova, G., Borooa, A., Gilmour, A., & Rienties, B. (2020). How can predictive learning analytics and motivational interventions increase student retention and enhance administrative support in distance education? *Journal of Learning Analytics*, 7(2), 72-83. <https://doi.org/10.18608/jla.2020.72.4>

Magic of learning design (does not come easy)



Learning Design: European Approaches

Barbara Wasson¹ · Paul A. Kirschner²

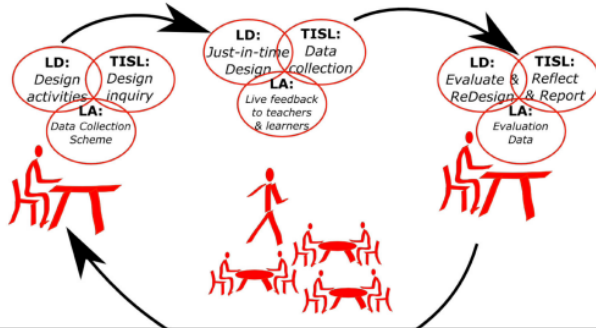
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Abstract

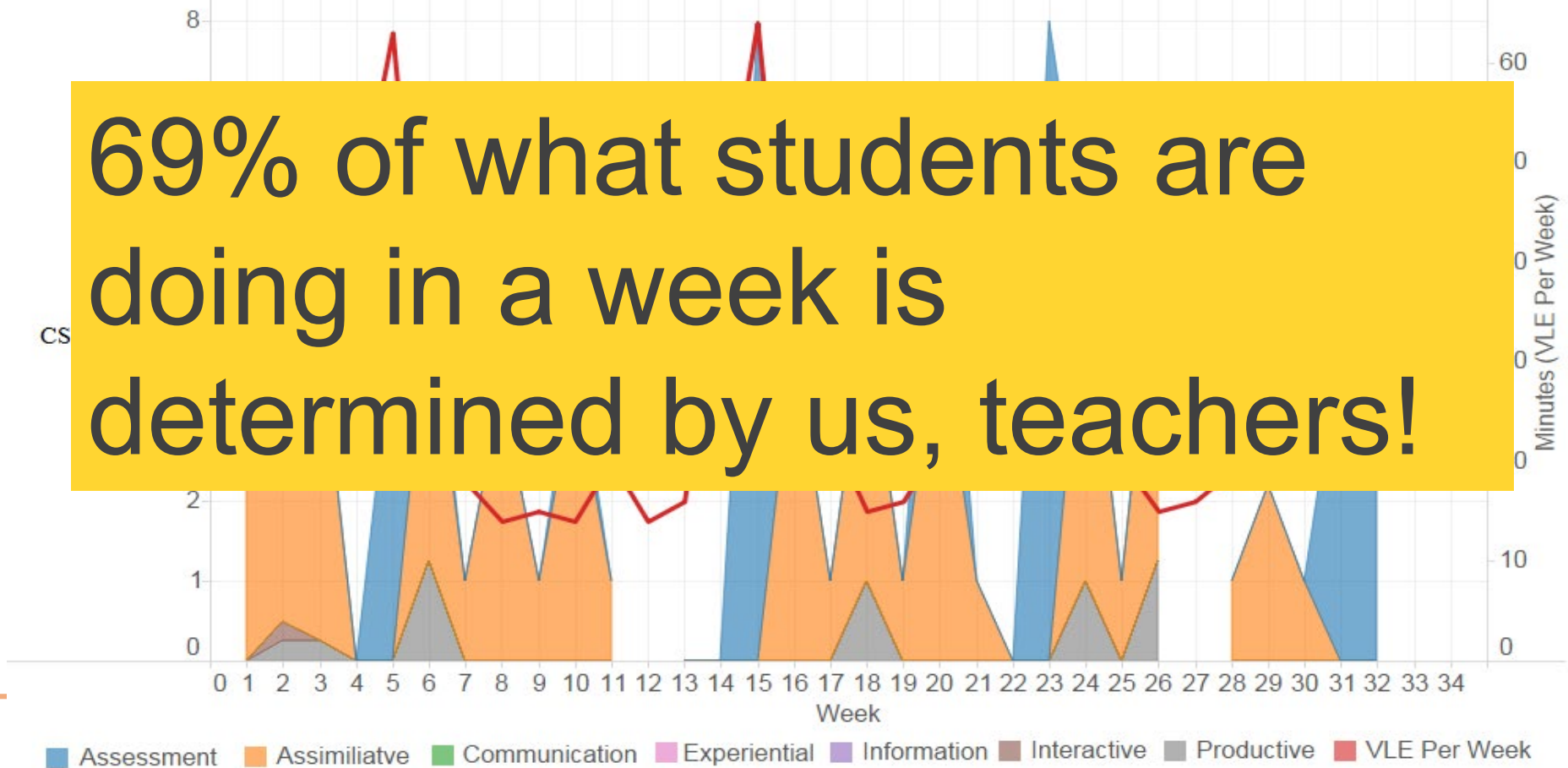
Research on instructional and learning design is ‘booming’ in Europe, although there has been a move from a focus on content and the way to present it in a formal educational context (i.e., instruction), to a focus on complex learning, learning environments including the workplace, and access to learner 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; Luckin et al. 2016; Wasson et al. 2016). While instructional design is an often heard term in the United States and refers

“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**, Toeteneel 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 (Toeteneel and Rienties 2016; Rienties and Toeteneel 2016; Rienties et al. 2015).”

Fig. 7 Teacher-led design inquiry of learning and innovation cycle (Wasson et al. 2016)



69% of what students are doing in a week is determined by us, teachers!



Nguyen, Q., Rienties, B., Toetnel, L., Ferguson, R., Whitlock, 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.

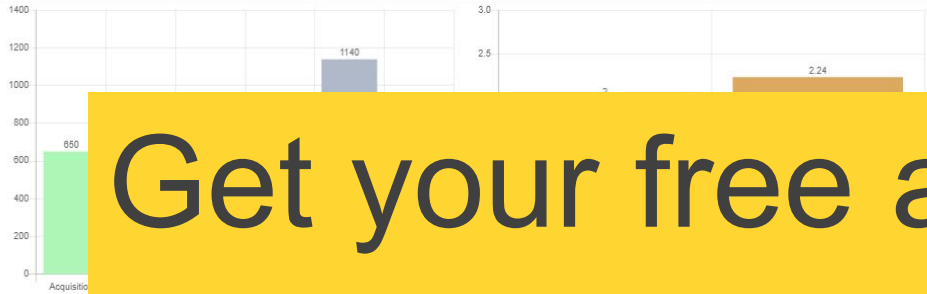
Teaching entrepreneurial competences1

COURSE DETAILS

PLANNING

ANALYSIS

Learner workload



Total workload

Competence

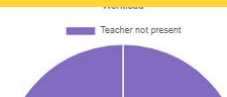
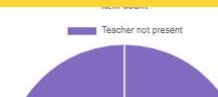
660 min

Mode of delivery



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Rienties, B., Balaban, I., Divjak, B., Grabar, D., Svetec, B., Vonda, P. (2023). Applying and translating learning design approaches across borders. *Practicable Learning Analytics*. O. Viberg and A. Gronlund (Eds). Springer Nature.

Rienties, B., Divjak, B., Eichhorn, M., Iniesto, F. Saunders-Smits, G., Svetec, B., Tillmann, A., Zizak, M. (2023). Online professional development across institutions and borders. *International Journal of Educational Technology in Higher Education*.



The 14th International Learning Analytics and Knowledge Conference

March 18 - 22, 2024

Kyoto, Japan



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SOCIETY FOR LEARNING ANALYTICS RESEARCH

The Society for Learning Analytics Research (SoLAR) is an interdisciplinary network of leading international researchers who are exploring the role and impact of analytics on teaching, learning, training and development.



ABOUT KYOTO UNIVERSITY

The local host of LAK24 is Kyoto University which is the second oldest Japanese university, one of Asia's highest ranked universities and one of Japan's National Seven Universities. One of Asia's leading research-oriented institutions, Kyoto University is famed for producing world-class researchers, including nine Nobel Prize laureates, two Fields medalists and one Gauss Prize winner. Kyoto University promotes itself as an academic institution fostering a "spirit of freedom".



LAK24 UPDATES

Dear Learning Analytics Community,

We write to inform you that the SoLAR Executive Committee has made the difficult decision to cancel the integrated virtual component of LAK24 scheduled for March 18 - 22, 2024.

To view the formal announcement from Bart Rienties, SoLAR President on behalf of the SoLAR Executive Committee regarding a change in the LAK24 conference format, visit:
<https://www.solaresearch.org/events/lak/lak24/news/>

<https://www.solaresearch.org/>

Next steps

1. How to use AI to identify common design patterns by teachers?
2. How to use AI to semi-automate some of the design and LA decisions?
3. How to use AI to provide automatic recommendations of TLA activities

Ooh yeah, and what about the role of educators and students?



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質問はメールで受け付けます

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in Higher Education



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