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Disclosing learners' behaviour and engagement into online and blended courses: Case study of Vytautas Magnus University

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Learning analytics for learners' behaviour observation

- Online learning platforms like MOOCs and Moodle access and collect large amounts of data allowing to observe and analyse learners' interaction, behaviour and engagement into study process at macro and micro levels.
- Clustering can help to illustrate learners' profiles based on their behaviour, like time spent of doing and completing the assignment, test or other learning activity, group learning, or time of one's engagement into specific activity (Antonenko, Toy & Niederhauser, 2012; Dutt, Ismail & Herawan, 2017).

Learners' behaviour clusters:

- Douglas et al. (2016) cluster learners into five groups based on their **material usage**: 1) *fully engaged learners*; 2) *consistent viewers*; 3) *two-week engaged learners*; 4) *one-week engaged learners*; 5) *sporadic learners*.
- Anderson et al. (2014) identify 5 clusters based on learners' engagement into the course through **video lectures and assignments**: *viewers*; *solvers*; *all-rounders*; *collectors*; and *bystanders*.

Learners' behavior clusters:

- Different clusters are suggested describing learners' behavior based on their **socialization and networking activities**:
 - Koller, Ng & Chen (2013) classify learners into *participants, active participants, community contributors*;
 - Khalil, Kastl & Ebner (2016) classify into *dropouts, excellent students, gamblers or learners who played with the system, and social learners*.



Theoretical foundations:

- Amount of interactions online can contribute to students' achievements in courses (Ellis, Han & Pardo, 2017);
- Participation in discussion forums and attendance of online lectures are positively associated with each other (Koc, 2017);
- Teachers' role changes from a knowledge deliverer to learning process designer (Buckingham Shum, & Crick, 2016);
- Learning analytics should be built upon educational theory in order to enable the use of advance machine learning methods to model behavioural, cognitive, and social processes associated with learning (Gašević, 2017).

Theoretical suggestions for learners engagement

- Shifting from the course related material to discussions before the mid-term, allowing learners to progress with a more in-depth analysis and understandings of the topic (Kim, 2016).
- Developing a badge system that has a positive impact on learners' participation and engagement (Anderson et al, 2014).

Research questions:

Desk research was implemented to answer the following research questions:

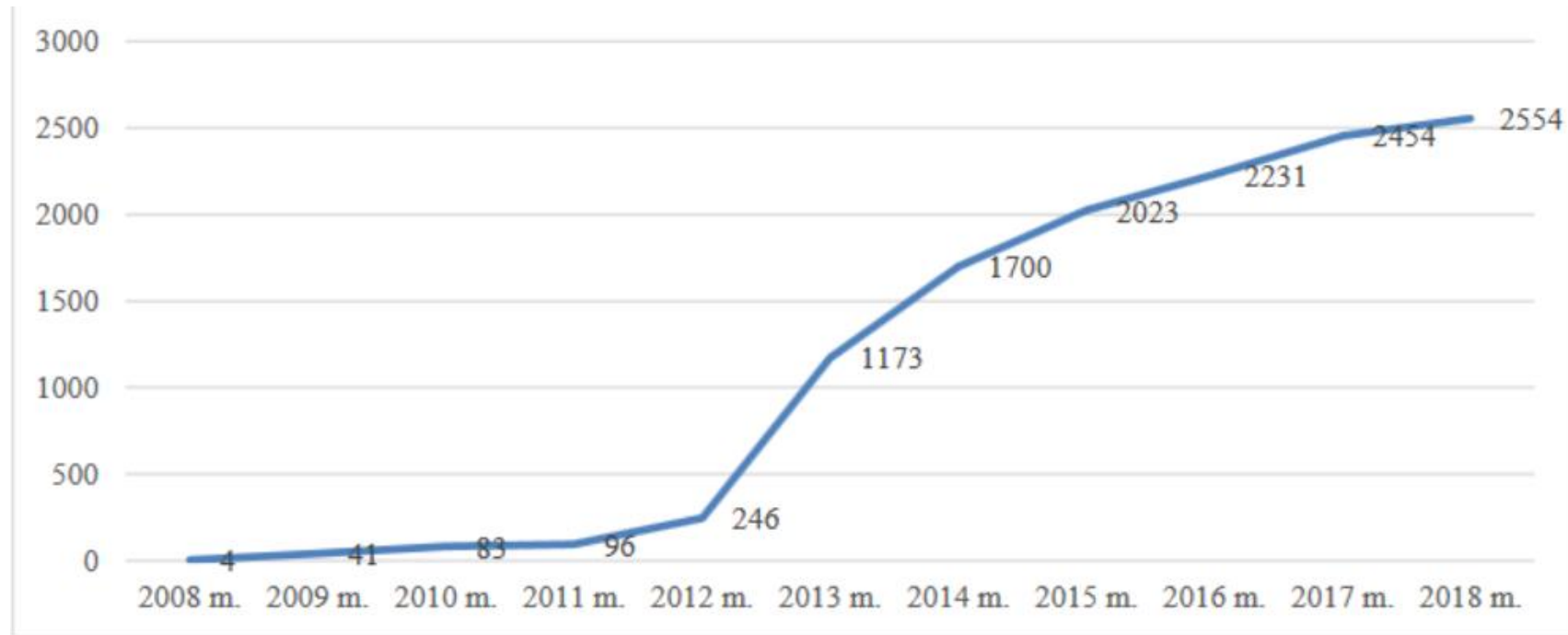
1. what are behavioural trends of VMU learners on Moodle platform?
2. what tools are used by teachers, aiming to correspond to diverse learning behaviours?





Results of the desk research

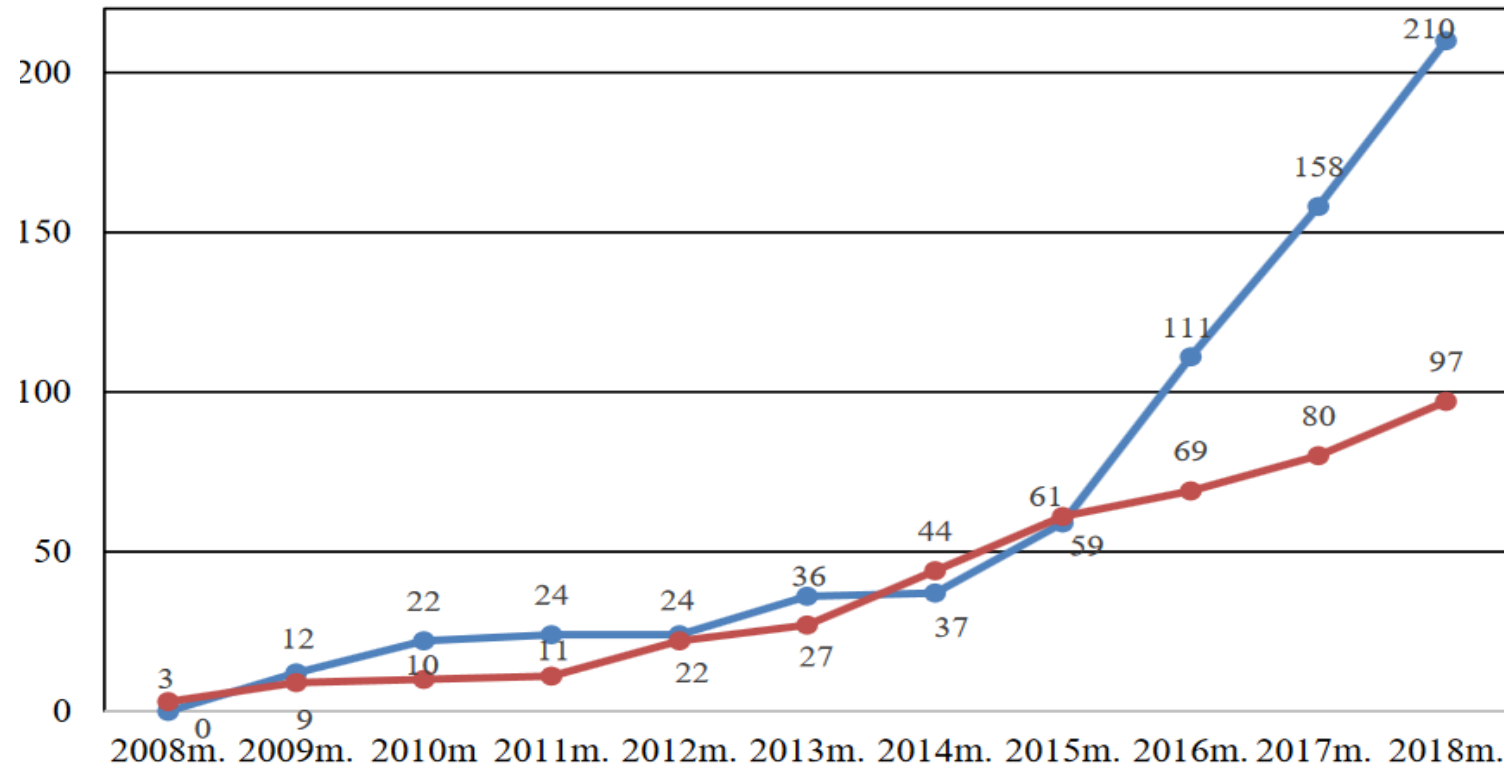
Number of courses uploaded on VMU Moodle platform



2554 courses, 705 teachers, 5694 students. About 87% of university courses are on VMU Moodle platform (date: 01/03/2019).

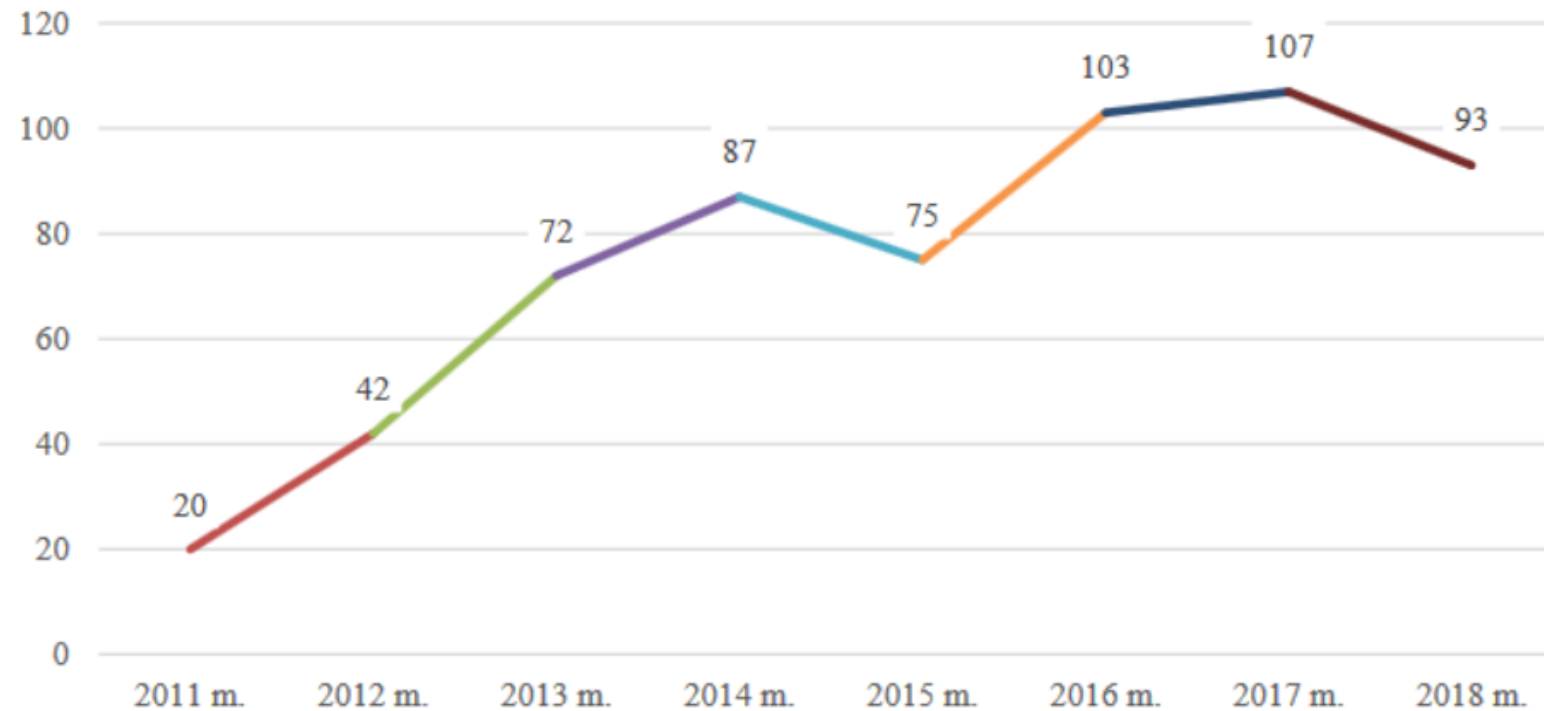


Number of **blended** and **online** modules on VMU Moodle platforms

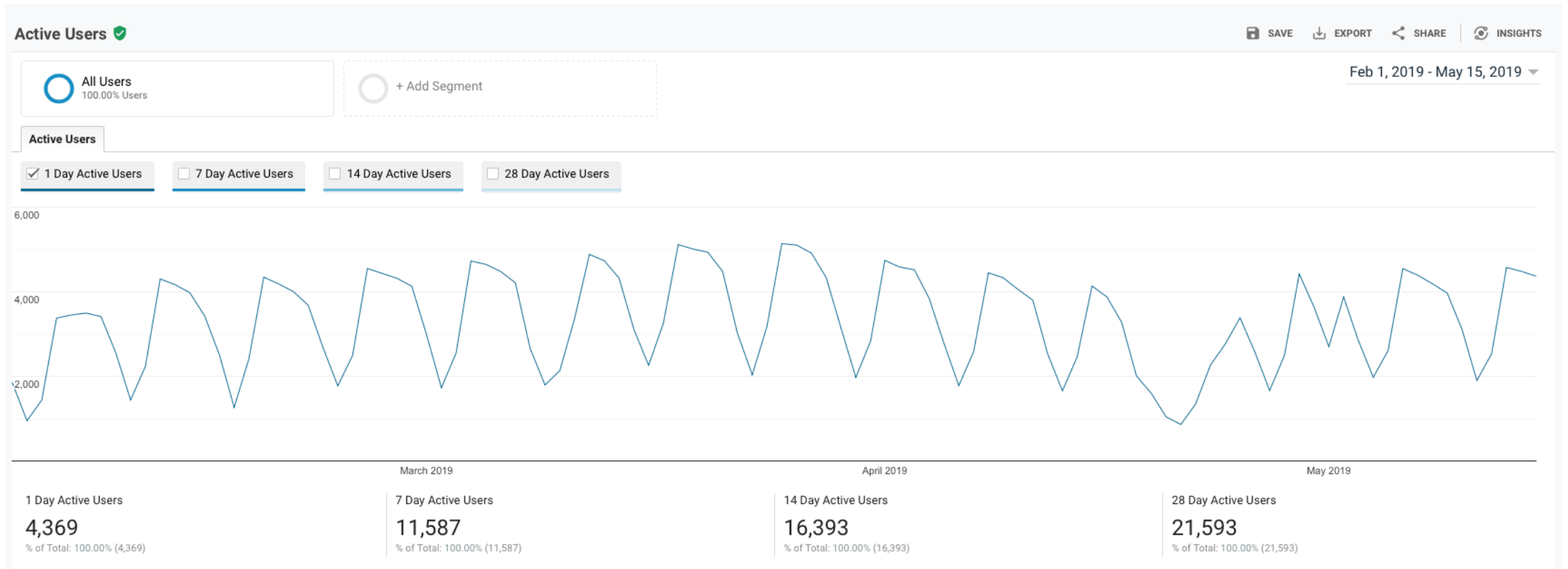




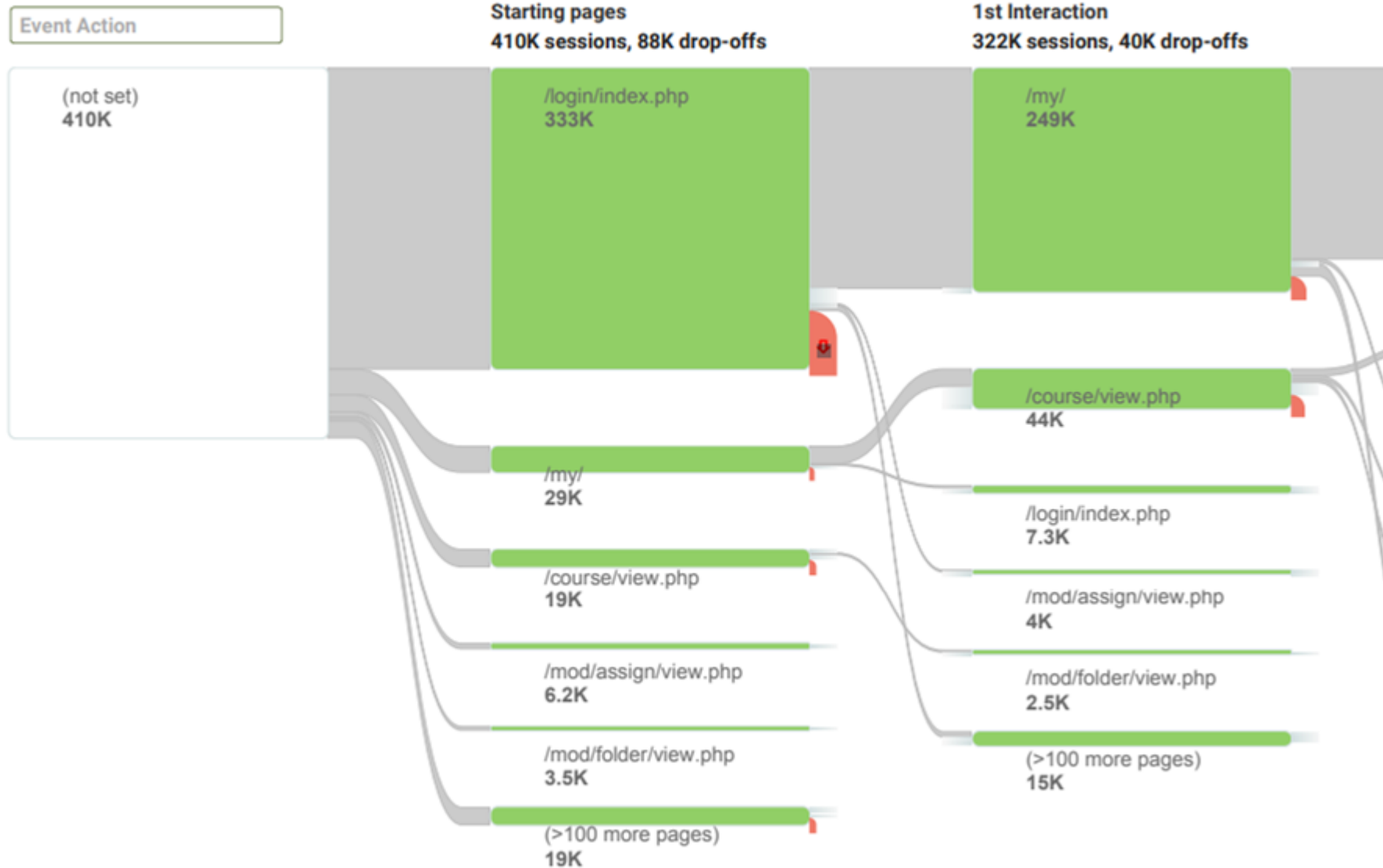
Users from 130 countries visited VMU Moodle in 2011 – 2018

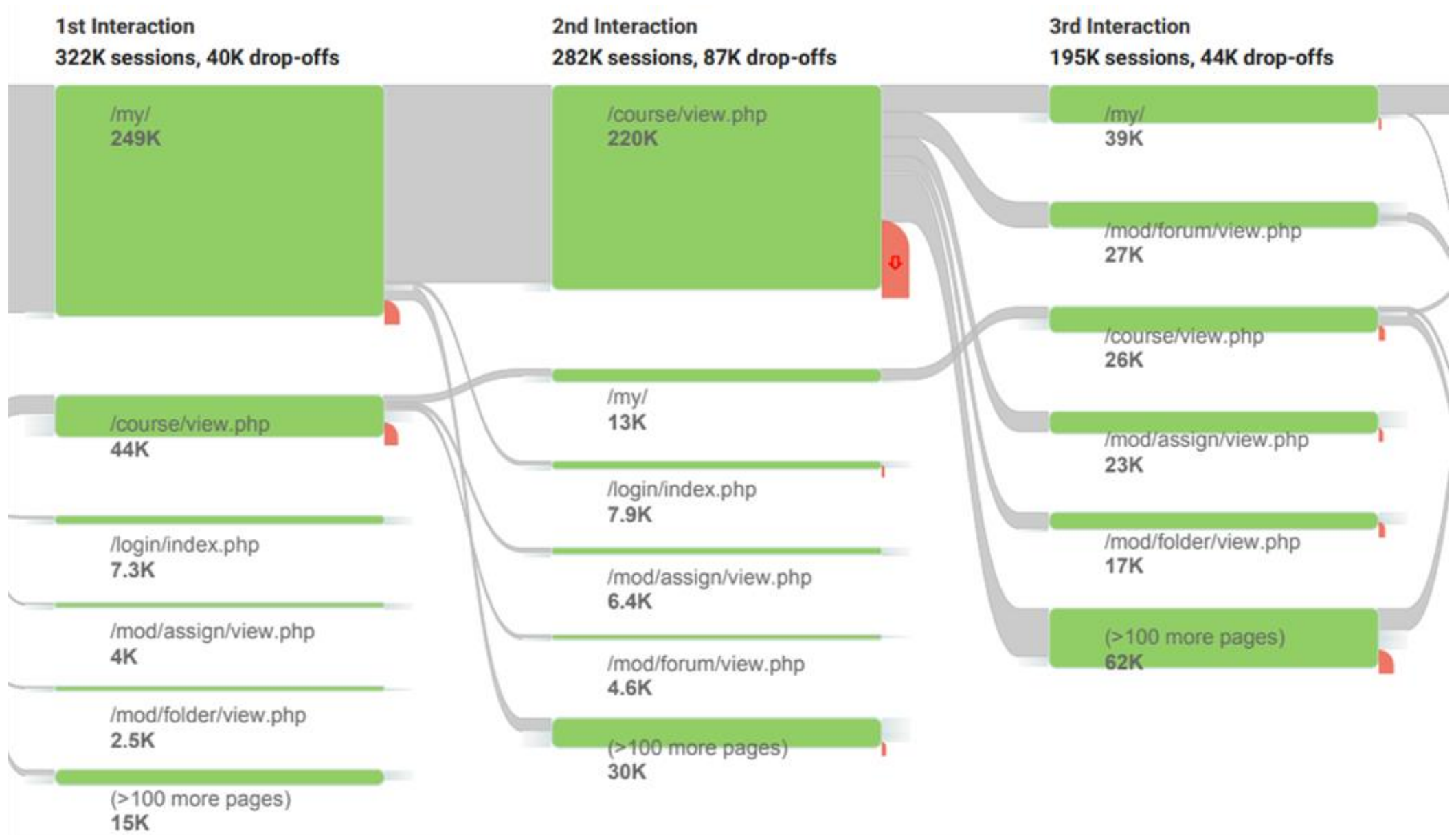


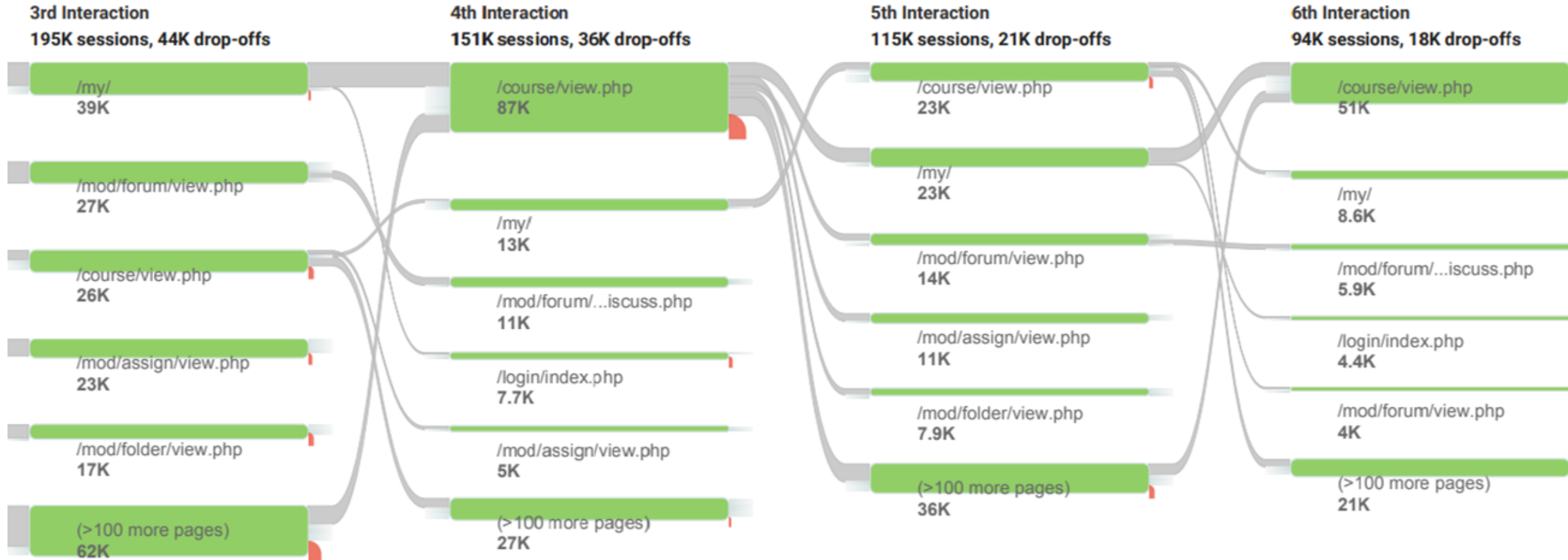
Active users connections



Learners' behavioral flow







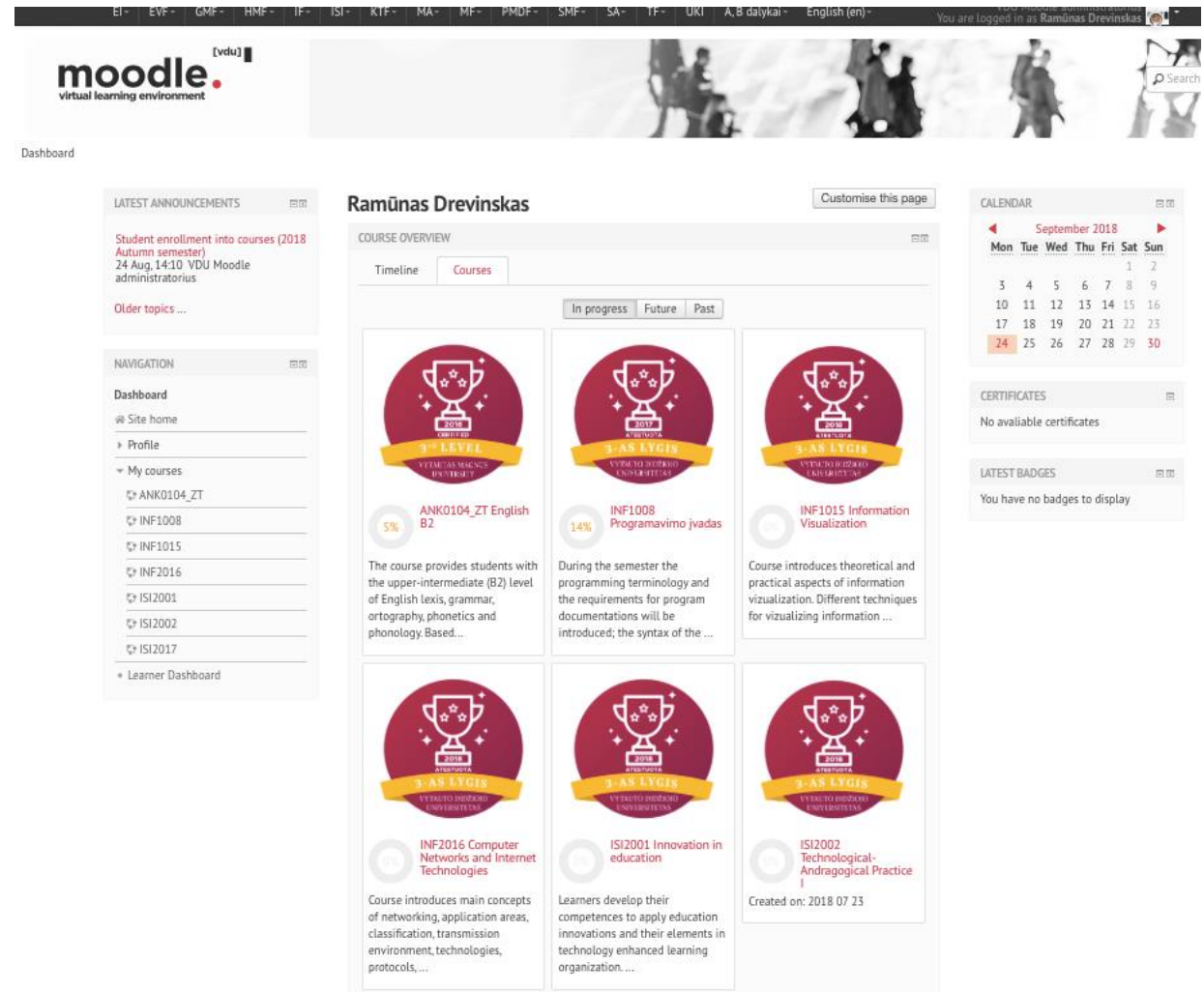
The most popular tools used in Moodle

	2012	2013	2014	2015	2016	2017	2018
Assignment	1045	1465	2185	3069	4426	5824	7104
Chat	215	247	226	225	258	285	282
Choice	73	83	118	148	259	351	419
Feedback	20	33	90	100	152	191	282
Forum	1928	2884	4170	4772	5802	6526	6821
Glossary	190	229	232	249	257	286	324
Group choice	8	38	47	78	140	199	217
HotPotatoes	748	908	933	1085	1141	1286	1304
Mindmap	12	37	53	79	155	165	139
Quiz	922	1023	1092	1187	1568	1940	2130
Wiki	56	73	156	187	234	252	272
Workshop	38	55	71	89	66	71	69
Database					45	66	80

Development of badge system at VMU:

Since July 2018:

- 335 University teachers rewarded with the badges for developing open or blended modules;
- 6 study modules have integrated badge reward system for active students.



The screenshot displays a Moodle user dashboard for Ramūnas Drevinskas. The main section is titled 'Ramūnas Drevinskas' and shows a 'COURSE OVERVIEW' for the user. The overview is divided into 'In progress', 'Future', and 'Past' sections. There are six badges displayed in a 2x3 grid, each representing a different course module with its progress percentage and a brief description. The badges are: ANK0104_ZT English B2 (5% progress), INF1008 Programavimo įvadas (14% progress), INF1015 Information Visualization, INF2016 Computer Networks and Internet Technologies (1% progress), ISI2001 Innovation in education, and ISI2002 Technological-Andragogical Practice (Created on: 2018 07 23). The dashboard also includes a 'LATEST ANNOUNCEMENTS' section, a 'NAVIGATION' menu, a 'CALENDAR' for September 2018, and a 'CERTIFICATES' section showing 'No available certificates'.

Conclusions

- Increased number of online and blended modules raise teachers' awareness on accessing and analysing learners' behaviour;
- Students demonstrate the need for an easily-absorbed information in small pieces;
- They demonstrate tendency to quit after the 4th click, and do not spend much time analysing course content, instead focus on the latest topic and discussion forums;
- Discussion forums are highly used, although in many cases, they serve as a platform for formal discussions, rather than an activity encouraging metacognitive and critical thinking, or socialization processes;
- Teachers need to acquire new competences, as there is a gap between knowing how to monitor learners' behaviour and how to act upon this data.

Further research steps

- Qualitative research on teachers' readiness to reconsider learners' behaviour and improve learning design according to the tendencies is being conducted, focusing on the following questions: how teachers apply LA data for their course improvement, do they recognise how this data should be monitored, what data do they monitor, and how they facilitate learners' discussions?
- Analysis of individual modules will be conducted, to observe how different activities are planned and created, encouraging teachers' metacognition and learners' engagement into the course.