Open Virtual Mobility

O2-A3.4: VMLH analytics report

- Final -

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Imprint: This publication is O2-A3.4 of the Open Virtual Mobility Erasmus+ strategic partnership founded by the European Commission 2017 - 2020 under **2017-1-DE01-KA203-003494,** URL: https://www.openvirtualmobility.eu/

This paper is the O2-A3.4 document - Virtual Mobility Learning Hub analytics report and aims at presenting the digital analytics of the VMLH.

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Executive summary

The *O2-A3.4: VMLH analytics* report includes all digital analytics performed for the entire OpenVM project time and includes the web analytics and learning analytics.
This report is intended for researchers interested in the design and technical features and analytics behind the Open Virtual Mobility Learning Hub.
For the web analytics we gathered analytics for the **OpenVM website** https://www.openvirtualmobility.eu/ in the period **1 Sep 2017 – 25 Aug 2020**. The website was quite well accessed as it had **8681** unique users who visited the website **13246** times. The users were very diverse, also outside of the project partners' countries, as most users were from the **United States** (22%), **Germany** (10%), **Italy** (9%), **Romania** (9%), **Netherlands** (5%), **Spain** (4%) and **France** (4%).

Regarding the learning analytics the overall activity inside the Hub for the past two years (**August 31st 2018 - August 31st 2020)** had a nonlinear evolution, with different peaks (October 2019 - January 2020, and April - May 2020) mainly due to the project's piloting phases in which students conducted most of the activity. A good measure of the OpenVM Learning Hub's activity is the current status of the content. According to the list of resource and activity instances used

throughout the Open Virtual Mobility Learning Hub (VMLH) , the most popular resource types are: HTML pages: 203 instances, External URLs: 112 instances, Files: 73 instances; while the top activity types are: Interactive Content (h5p): 291 instances, Quiz: 72 instances, Assignments (file upload or online text): 49 instances.

The VMLH learning analytics report looks at the quantitative impact, measured using metrics and statistics provided in the VM Learning Hub and website. Combined with the O5 and O6 report this report provides the key metrics related to the impact of the project:

- Enhanced Virtual Mobility skills of educators and students in higher education measured based on the positive results of eAssessments for each course, types and number of OpenVM badges issued and earned to recognise VM skills
- Inclusion of disabled educators and students are measured by the number of persons with diverse challenges registered in the VM Learning Hub and actively participating in all courses and earning badges
- Reduced gender-specific barriers related to the uses of technology was measured by the number of female users and participants and their level of participation, interaction and task completion, included in the O2-A2.5: VMLH validation report

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1. Aims and Scope

This report includes all digital analytics performed for the entire OpenVM project time and includes the web analytics and learning analytics.

2. Methodology - Digital Analytics

Digital analytics encompasses the collection, measurement, analysis, visualisation, and interpretation of digital data illustrating user behaviour on websites, mobile sites, and mobile applications. The Digital analytics used by the OpenVM project consists of web analytics and learning analytics. (Chaffey, 2012)

Digital analytics use the concept of a purchase funnel. There are different stages within the funnel that describe user interactions. A basic purchase funnel includes the following steps:

- Acquisition involves building awareness and acquiring user interest
- Behavior is when users engage with the application
- Conversion is when a user-visitor becomes a user and transacts with our application (Chaffey, 2012)

Figure 1. The Purchase Funnel

In the online world, it is possible to measure many different aspects of the funnel using digital analytics. The main goal is to track what online behavior led and online activities and use that data to make informed decisions about how the application is used by the different users and also how to reach new users.

Web analytics groups together the measurement, collection, analysis and presentation of data from the web in order to understand and optimise how websites are used. Web analytics allows us to study user behaviour on the OpenVM website and Learning Hub, including the mobile application.

Today, web analytics is a key element in digital marketing and website optimisation. Web analytics is based on data collected by audience measurement tools, the one used in the project is Google Analytics. Google Analytics is a platform that collects data and compiles it into useful reports.

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To track a website, we used a Google Analytics account of the Politehnica University of Timisoara, based on the university servers and digital data, where also the OpenVM online tools are hosted. We added a piece of Javascript tracking code to each page and application on the OpenVM online hubs. Every time a user visits the website or the Hub, the tracking code will collect anonymous information about how that user interacted with the page.

The Google Analytics report which we use for the analysis of the OpenVM site and Learning Hub is based on:

- Real-Time Reports: look at live user behavior on a website including information like where the users are coming from and if they're converting.
- Audience Reports: show characteristics about users like age and gender, where they're from, their interests, how engaged they were, whether they're new or returning users, and what technology they're using.
- Acquisition Reports: show which channels (such as advertising or marketing campaigns) brought users to the OpenVM site. This could include different marketing channels such as: "Organic" (or unpaid search), "CPC" ("cost per click" or paid search), "Referral" (traffic that comes from another website), "Social" (from a social network), or "Other," (a group of low volume traffic sources)
- Behavior Reports: show how people engaged on OpenVM site including which pages they viewed, and their landing and exit pages.

Learning analytics, the part of digital data analysis that has impact on the learning and teaching, refers to the measurement, collection, analysis and reporting of data about the progress of learners and the contexts in which learning takes place (Gasevic, 2015). Using the increased availability of big datasets around learner activity and digital footprints left by student activity in learning environments, learning analytics can improve the understanding of how learning takes place and how learning occurs in online environments.
Every time a user interacts with the OpenVM Learning Hub – logging into the virtual learning environment, performing activities or submitting assessments online – they leave behind a digital footprint (Mah, 2016). Learning analytics is the process of using this data to analyse the impact of this data, how the system behaves towards users and to improve learning and teaching, which are part of the OpenVM LH MOOCs piloting (O6) and OpenVM LH evaluation (O2).
The learning analytics for the OpenVM Learning Hub is based on the use of the Moodle learning data and statistics module [1].

[1] https://docs.moodle.org/38/en/Analytics

The Open Virtual Mobility Learning Hub analytics report looks into web analytics and learning analytics.

3. Results

OpenVM Website analytics and data

We gathered analytics for the **OpenVM website** https://www.openvirtualmobility.eu/ in the period **1 Sep 2017 – 25 Aug 2020**.

The website had **8681** unique users who visited the website **13246** times. The average session duration is **2 minutes and 26 seconds**.

The **evolution of the number of users** visiting the website is displayed below:

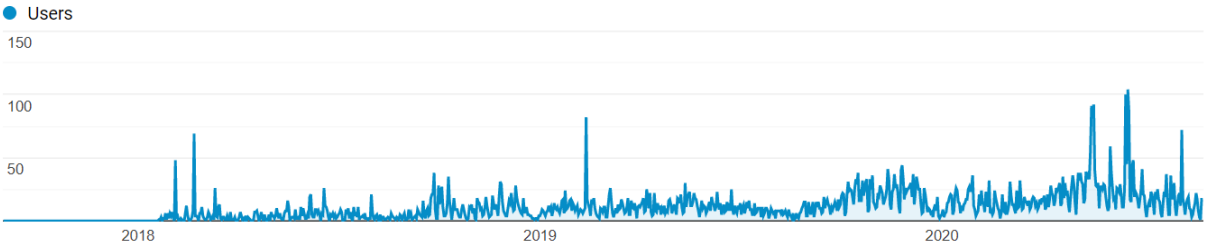


Figure 2. Evolution of the number of users visiting the website

The most visited sections of the website are the **Homepage**, the **Learning Hub**, the **About Us**, the **Open Credentials**, and the **Publications**.

Most users were from the **United States** (22%), **Germany** (10%), **Italy** (9%), **Romania** (9%), **Netherlands** (5%), **Spain** (4%) and **France** (4%).

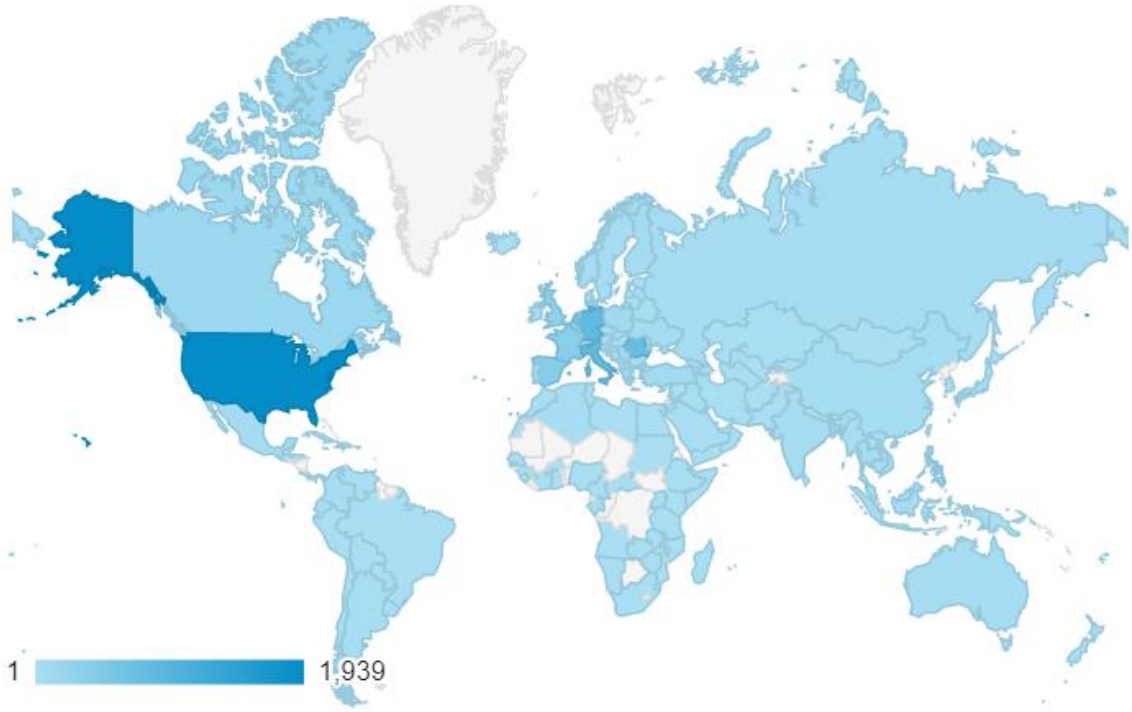


Figure 3. Countries where users come from on the website

More than **two-thirds** of the users visited the website from a **desktop** device, while around **15%** opened the website on their **smartphone**.

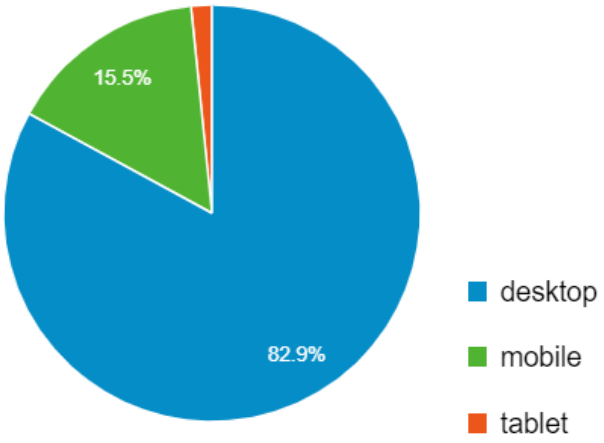


Figure 4. Devices used by the users to access the website

Regarding the channels, around **half** of the users found the website through **organic search** (Google, Bing), **35%** came **directly** (they knew the URL), around **15%** found the website through a **link** from

other websites and around **5%** found out about the website on **Social Media** (Twitter, Facebook, YouTube, LinkedIn, in this order).

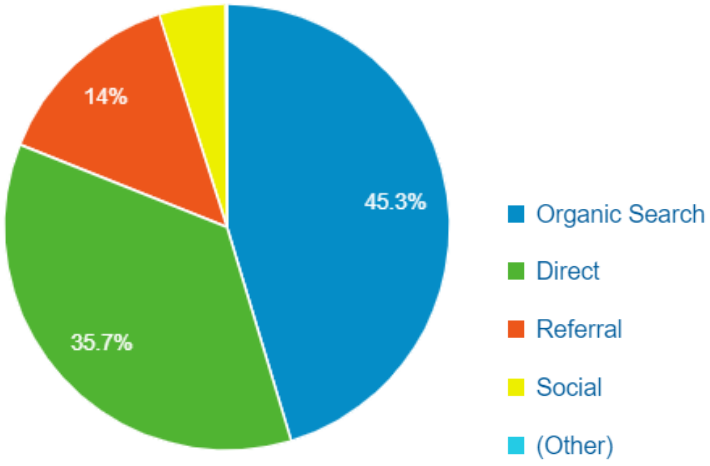


Figure 5. User acquisition channels

Currently, the OpenVM website offers **330 OERs** (Open Educational Resources) presented in 12 categories.

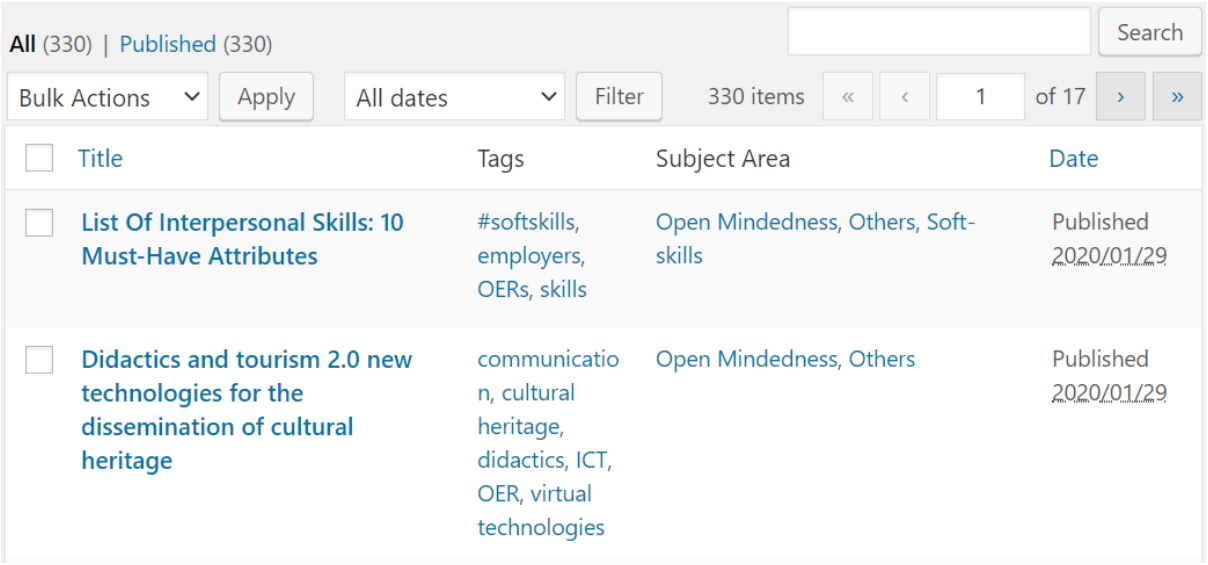


Figure 6. Screenshot of OERs on the website (backend)

OpenVM Hub analytics and report

The activity inside the OpenVM Learning Hub is separate from the website, and reflects all the operations for creating, managing and following the MOOCs, OERs and other administrative areas of the platform.

Since it is based on the popular LMS Moodle, activities inside the Hub are split according to the roles users of the platform possess in different contexts.

The overall activity inside the Hub for the past two years (August 31st 2018 - August 31st 2020) is presented in the following Figure 7. The evolution of this activity is evident, with different peaks (October 2019 - January 2020, and April - May 2020) mainly due to piloting phases in which students comprised the bulk of the activity.

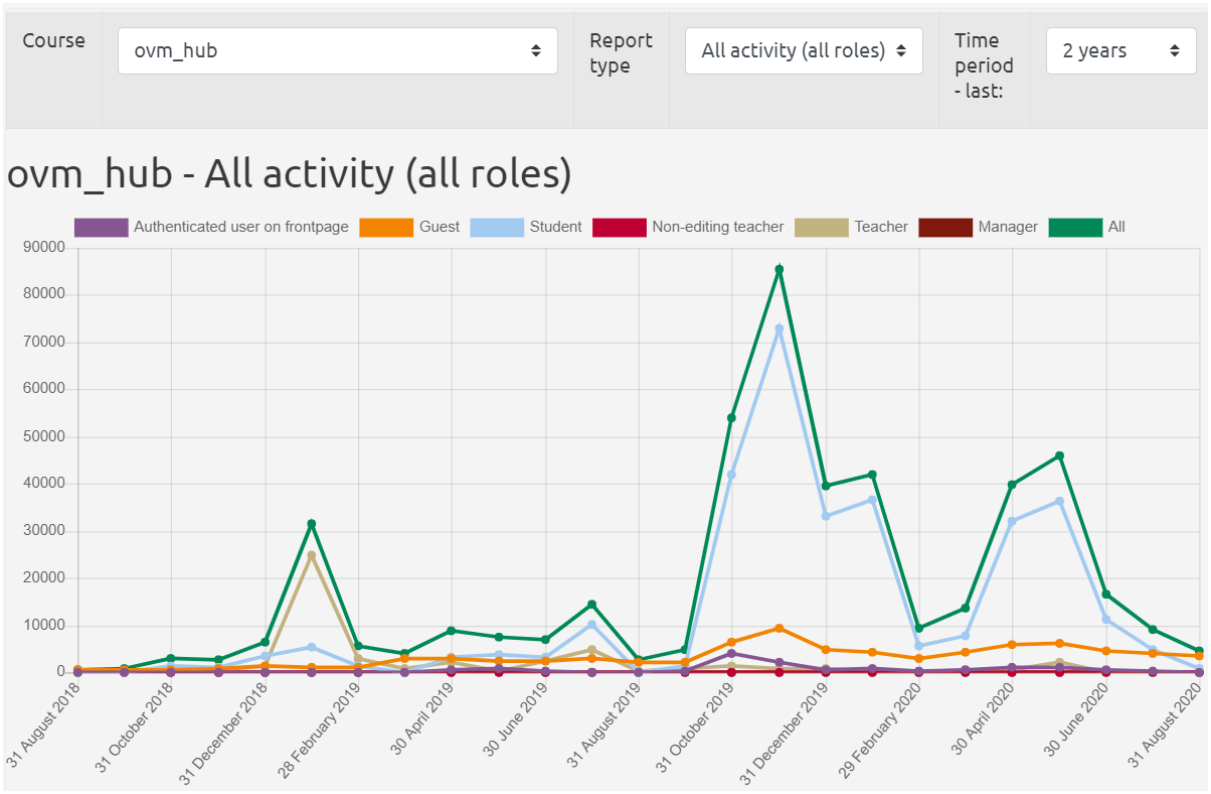


Figure 7. Usage statistics (hits - page requests) for the last 2 years, for all user roles

A good measure of the Hub's activity is the current status in regards to content. According to the list of resource and activity instances used throughout the VMLH (available in the following Figure 8), the most popular resource types are:

- Webpages: 203 instances,
- URLs: 112 instances,
- Files: 73 instances,

while the top activity types are:

- Interactive Content (h5p): 291 instances,
- Quiz: 72 instances, and
- Assignments (file upload or online text): 49 instances.

The forum (with 144 instances deployed) is a special type of activity, since it is created automatically in each new course on the Hub (even if more instances can be subsequently added).

The two types of activity plugins especially created for the VMLH (Group formation and OpenVM Survey) are also well represented, with 9 instances each.

Open Virtual Mobility Learning Hub

Dashboard / Site administration / Plugins / Activity modules / Manage activities

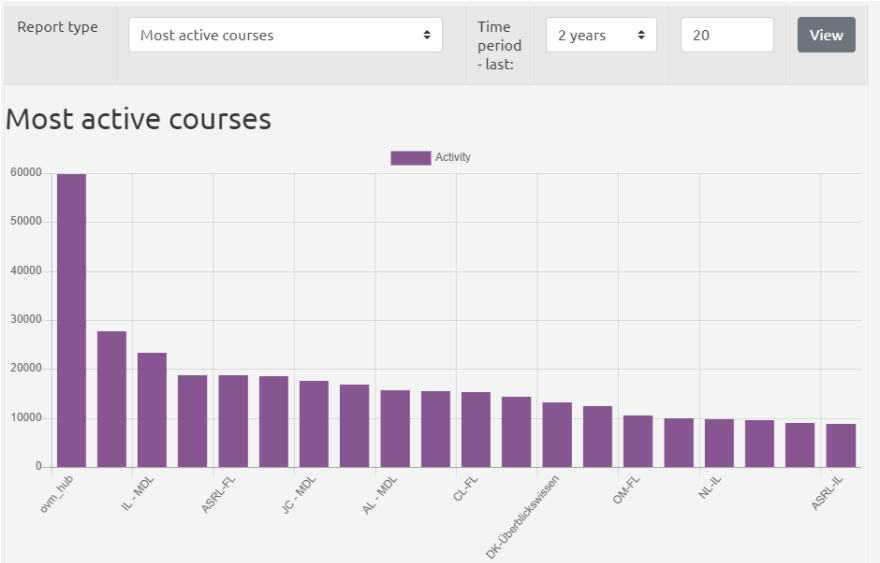
Activities

Activity module	Activities	Version	Hide/Show	Settings	Uninstall
Assignment	49	2019111800		Settings	Uninstall
Book	0	2019111800		Settings	Uninstall
Chat	0	2019111800		Settings	Uninstall
Choice	2	2019111800			Uninstall
Group choice	9	2019051002		Settings	Uninstall
Database	2	2019111800		Settings	
Feedback	2	2019111800		Settings	
Folder	0	2019111800		Settings	Uninstall
Forum	144	2019111801		Settings	
Glossary	0	2019111800		Settings	
Group formation	9	2018062300		Settings	Uninstall
Interactive Content	291	2020020500		Settings	Uninstall
IMS content package	0	2019111800		Settings	Uninstall
Label	59	2019111800		Settings	Uninstall
Lesson	9	2019111800		Settings	Uninstall
External tool	0	2019111800		Settings	Uninstall
OU blog	40	2018032001		Settings	Uninstall
OpenVM survey	9	2020070805			Uninstall
Page	203	2019111800		Settings	Uninstall
Quiz	72	2019111800		Settings	
File	73	2019111800		Settings	Uninstall
SCORM package	0	2019111800		Settings	Uninstall
Stamp collection	3	2017111200			Uninstall
Survey	0	2019111800			Uninstall
URL	112	2019111800		Settings	Uninstall
Wiki	0	2019111800			Uninstall
Workshop	20	2019111800		Settings	Uninstall

Figure 8. Overview of activity and resource instances

Aside from the general activity on the Hub (discussed previously), statistics allow the analysis of the activity inside each of the courses on the platform, with a hierarchy of the most active 20 courses presented in the following image. The first course in this top 20 (with more than double the number

of hits of the next course in the hierarchy) is a special type of course, in that it represents the common parts of the platform (the individual Dashboards, the Frontpage, etc.), and is therefore not a proper course.



Show chart data

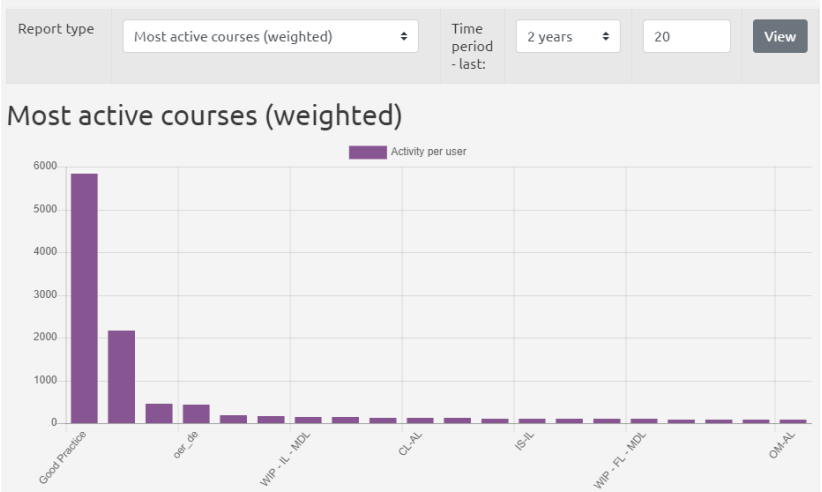
Course	Activity
ovm_hub	59796
FL - MDL	27781
IL - MDL	23400
CL-IL	18839
ASRL-FL	18704
IS-FL	18630
JC - MDL	17553
CL-AL	16875
AL - MDL	15680
IS-IL	15539
CL-FL	15401
NL-FL	14355
DK-Überblickswissen	13212
oer_de	12431
OM-FL	10500
JC - ASRL	9877
NL-IL	9698
upt_tt2019	9532
IS-WL	9037
ASRL-IL	8888

Figure 9. List of most active courses by number of hits (clicks)

The list above (Figure 9) presents the total number of hits, regardless of the number of enrolled users. Here is the legend of abbreviations:

- ➔ FL-Foundation Level
- ➔ IL-Intermediate Level
- ➔ AL-Advanced Level
- ➔ MDL-Media and Digital Literacy
- ➔ CL-Collaborative Learning
- ➔ ASRL-Active Self-Regulated Learning
- ➔ IS-Intercultural Skills
- ➔ ADL-Autonomy-Driven Learning
- ➔ NL-Networked Learning
- ➔ OM-Open Mindedness
- ➔ OEVM-Open Education and Virtual Mobility

A weighted list which takes into account the number of enrolled users is presented as follows (Figure 10).



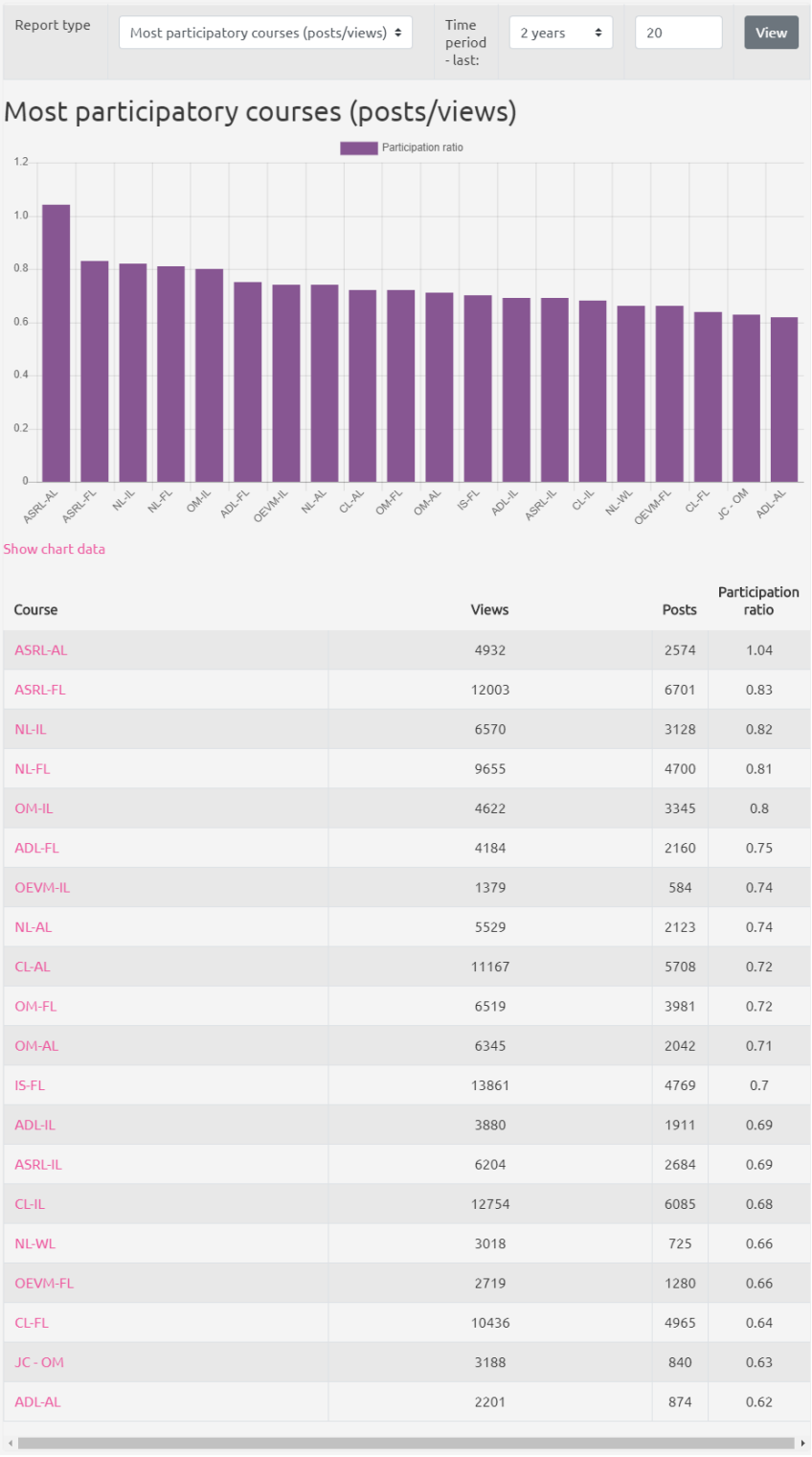
Show chart data

Course	Activity	Users	Activity per user
Good Practice	5830	1	5830
market	4321	2	2160.5
DK-Überblickswissen	13212	29	455.59
oer_de	12431	29	428.66
DK-Praktische Anwendung	5564	29	191.86
DK-Weitergabe an Andere	4963	29	171.14
WIP - IL - MDL	156	1	156
WIP - JC - MDL	275	2	137.5
CL-IL	18839	144	130.83
CL-AL	16875	140	120.54
NL-FL	14355	121	118.64
upt_tt2019	9532	83	114.84
IS-IL	15539	141	110.21
NL-IL	9698	94	103.17
WIP - AL - MDL	99	1	99
WIP - FL - MDL	391	4	97.75
FL - MDL	27781	305	91.09
IS-FL	18630	209	89.14
NL-AL	7652	86	88.98
OM-AL	8387	97	86.46

Figure 10: List of most active courses, weighted by number of enrolled users and sorted descending by activity per user

The hits previously mentioned include any type of interaction, including simple navigation. By taking into account the type of action (according to the CRUD convention), the *active clicks* (any action

which changes something) could be separated from simple viewing and compile the following list (Figure 11).



Course	Views	Posts	Participation ratio
ASRL-AL	4932	2574	1.04
ASRL-FL	12003	6701	0.83
NL-IL	6570	3128	0.82
NL-FL	9655	4700	0.81
OM-IL	4622	3345	0.8
ADL-FL	4184	2160	0.75
OEVM-IL	1379	584	0.74
NL-AL	5529	2123	0.74
CL-AL	11167	5708	0.72
OM-FL	6519	3981	0.72
OM-AL	6345	2042	0.71
IS-FL	13861	4769	0.7
ADL-IL	3880	1911	0.69
ASRL-IL	6204	2684	0.69
CL-IL	12754	6085	0.68
NL-WL	3018	725	0.66
OEVM-FL	2719	1280	0.66
CL-FL	10436	4965	0.64
JC - OM	3188	840	0.63
ADL-AL	2201	874	0.62

Figure 11. List of most participatory courses

Another relevant metric analyzed was the number of questions employed in quiz-type activities, since this is a direct measure of the participatory nature of a course (a student cannot simply view a quiz, they must answer the questions). The results of this analysis are presented in the form of the following list (Figure 12).

Report settings

This report lists all the contexts in the system where there are questions of a particular type.

Question type: All

Get the report

Report for all question types

Context	Total	Visible	Hidden
Course: Media and Digital Literacy - Foundation Level	37	37	0
Course: Media and Digital Literacy - Intermediate Level	37	37	0
Course: Welcome to the MOOC Media and Digital Literacy!	30	30	0
Course: Welcome to the MOOC Collaborative learning!	30	30	0
Course: WIP - Welcome to the MOOC - Media and Digital Literacy!	30	30	0
Course: Autonomy-driven learning - Intermediate level	27	27	0
Course: Networked learning - Foundation Level	25	25	0
Course: Networked learning - Intermediate Level	23	23	0
Course: Networked learning - Advanced Level	21	21	0
Course: Collaborative learning - Intermediate Level	20	20	0
Course: Welcome to the MOOC Autonomy-driven Learning!	20	20	0
Course: WIP - Media and Digital Literacy - Foundation Level	20	20	0
Course: WIP - Media and Digital Literacy - Intermediate Level	20	20	0
Course: Autonomy-driven learning - Foundation level	18	18	0
Course: Welcome to the MOOC Networked Learning!	18	18	0
Course: Collaborative learning - Foundation Level	17	17	0
Course: Collaborative learning - Advanced Level	17	17	0
Course: Autonomy-driven learning - Advanced level	17	17	0
Course: Intercultural skills - Intermediate level	15	15	0
Course: Active Self-regulated learning - Advanced Level	15	15	0
Course: Welcome to the MOOC Intercultural skills!	14	14	0
Course: Open mindedness - Foundation Level	14	14	0
Course: Open mindedness - Intermediate Level	14	14	0
Course: Active Self-regulated learning - Intermediate level	13	13	0
Course: Active Self-regulated learning - Foundation Level	12	12	0
Course: Welcome to the MOOC Open mindedness!	12	12	0
Course: Open mindedness - Advanced Level	12	12	0
Course: Welcome to the MOOC Active Self-regulated Learning!	11	11	0
Course: Intercultural skills - Foundation level	8	8	0
Course: Intercultural skills - Advanced level	8	8	0
Course: Open Education and Virtual Mobility - Foundation Level	8	8	0
Course: Test course	3	3	0
Course: Open Education and Virtual Mobility - Intermediate Level	3	3	0
Course: Test Course UPT	3	3	0
Course: Digitale Kompetenzen - Einführung	1	1	0
Total	593	593	0

Figure 12. Number of question instances in quiz activities, ordered by courses

4. Conclusion

The OpenVM analytics report looks at the quantitative impact measured using metrics and statistics provided in the OpenVM Learning Hub and website, and combined with the O5 and O6 report provide the key metrics related to the impact of the project:

- Enhanced Virtual Mobility skills of educators and students in higher education measured based on the positive results of eaAssessments for each course, types and number of OpenVM badges issued and earned to recognise VM skills.
- Inclusion of disabled educators and students are measured by the number of persons with diverse challenges registered in the OpenVM Learning Hub and actively participating in all courses and earning badges
- Reduced gender-specific barriers related to the uses of technology was measured by the number of female users and participants and their level of participation, interaction and task completion, included in the O2-A2.5: VMLH validation report

The *O2-A3.4 VMLH analytics report* is a key report for the results and metric data of the OpenVM project.

5. References

Chaffey, D., Patron, M. *From web analytics to digital marketing optimization: Increasing the commercial value of digital analytics*. J Direct Data Digit Mark Pract 14, 30–45 (2012)

Gasevic, Dragan & Dawson, Shane & Siemens, George. (2015). *Let's not forget: Learning analytics are about learning.* TechTrends. 59. 10.1007/s11528-014-0822-x.

Mah, D. *Learning Analytics and Digital Badges: Potential Impact on Student Retention in Higher Education*. Tech Know Learn 21, 285–305 (2016).

Attachments

none

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