Open Virtual Mobility

O2-A3.5: VMLH Final prototype and report

- Final -

Outcome 2 Activity A3.5 VMLH Final prototype and report	
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Imprint

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This paper is the Outcome O2 – A3.5 Virtual Mobility Learning Hub Final prototype and report and aims at presenting the final prototype version of the Virtual Mobility Learning Hub.

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Executive summary

The *O2-A3.5 Final prototype and report* presents how the Open Virtual Mobility Learning Hub achieved its final prototype version, starting from the concept developed in O2-A2, integrated into the online environment, taking into account partners' discussions and suggestions, as well as results and developments from other activities and, in the end it was evaluated with users and updated after the user evaluation.

What are the objectives of this paper?

The main objective of this report is to present how the University Politehnica of Timisoara, leader of Output 2, arrived at the final prototype of the Virtual Mobility Learning Hub, going through several steps.

Who is this paper for?

- Pedagogues and didacticians interested in the design and technical infrastructure behind the Virtual Mobility Learning Hub.

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- Researchers interested in discussion and presentation of currently existing challenges in the field of VLEs and user case scenarios.

What topics are addressed in this paper?

VLEs, OERs, MOOCs, Open badges, LMS, Moodle

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Acknowledgements

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1. Aims and Scope

To present how the Politehnica University of Timisoara partner, head of Output 2, arrived at the final prototype of the Virtual Mobility Learning Hub, going through several steps. It considers information starting with **O2-A1 Technical Concept**, mainly *O2-A1.1: VM Learning Hub concept* and the *O2-A1.2: VMLH Design, User, Functional and Technical Specifications*, followed by the technical implementation developed part **of O2-A2 Implementation**, especially the *O2-A2.2: VMLH with smart tools, assessment, credentials* and the *O2-A2.3: VMLH with integrated OERs & MOOCs* and *O2-A2.6: VM Learning Hub in all partner languages* and the evaluation of the OpenVMLH done in **O2-A3 Evaluation**.

2. Methodology

The applied methodology for the concept and implementation of the Virtual Mobility Learning Hub (VMLH) follows the principles of agile development (Beck, 2001), and socio-cognitive engineering method (Sharples, 2002; Andone, 2009), with focus on frequent technical and user cases iterations and then, user tests to improve user experience.

The methodology and tools applied in O2-A1 in relation to O2-A2: UPT internal consultations, OpenVM internal consultations, external consultation on VMLH with experts, continuous adaptation and improvements based on usability evaluations.
The development of the VMLH implied an interdisciplinary
approach from web technologies, mobile technologies, Web 2.0, interactive media and audio-video technologies, open access and tools for semantic technology, user interfaces and web usability. The methodology used in OpenVMLH results was also published in (Ternauciuc, 2019).

3. Results

Starting from the diagram of the VMLH, as presented in *O2-A1: VMLH Concept Description*[1], we analyzed the functionalities envisioned for the VMLH.

The structure of the VMLH is (see Figure 1):
(1) VM Skills - a description of virtual mobility skills including alignment to existing competency frameworks in a competency directory (O3);
(2) VM e-Assessment - different forms of digital self-/assessment including digital evidence (such as testimonials, digital assets, e-portfolios, crowd evidencing) applied as elements of open credentials and supporting open, evidence-based assessment (O4);
(3) VM Open Credentials - digital recognition of VM skills based on current forms of open digital credentials such as Open Badges and Blockcerts (O5);
(4) VM Content - User Generated Content, Open Educational Resources and other forms of Open Content to support learning about VM and developing VM Skills (O6);
(5) VM Activities - Open Learning Activities including learning in and through MOOCs, peer-to-peer activities, virtual/blended collaborations (O6);
(6) VM Market / Connections - finding cooperation partners for VM activities ;
(7) VM Data - data about learning pathways and learning outcomes captured by xAPI and feeding into E-Assessment, Open Credentials and recommendations for learning.

[1] https://www.openvirtualmobility.eu/outputs/1095-o2-learning-hub/

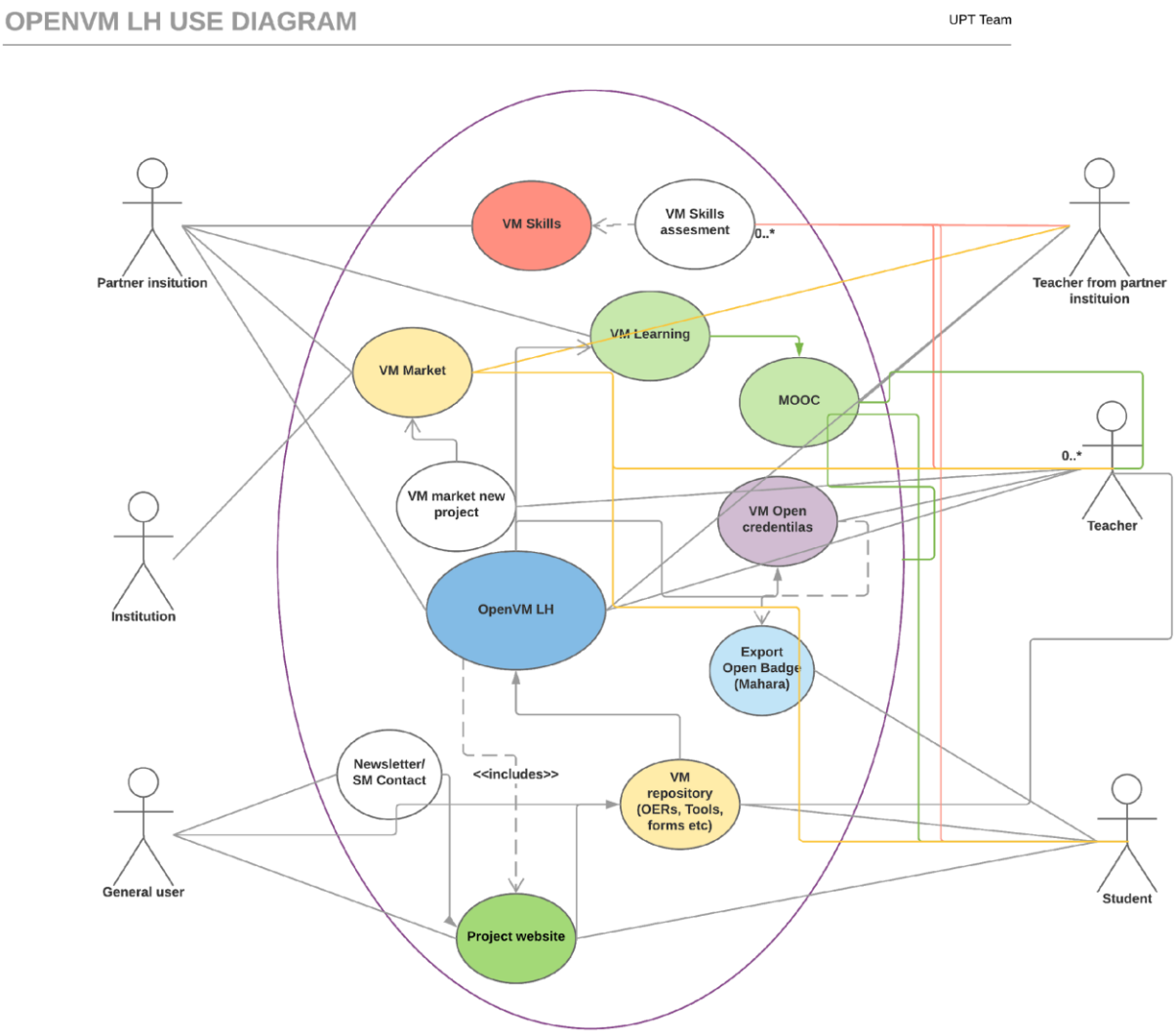

Figure 1. VMLH functional diagram

After this was discussed amongst partners and validated we moved on to the next phase and implemented these functionalities and structure into a Moodle environment, starting the VMLH per se. The technical structure and functionality of the VMLH was detailed into *02-A2 VIRTUAL MOBILITY LEARNING HUB TECHNICAL IMPLEMENTATION* (Figure 2). Moodle was chosen as the basis for the VMLH due to its reputation as the leading open-source learning management system (LMS), the fact that it covers most of the needs of a modern learning environment, the possibility of networking different university platforms through the MNET procedures (Moodle Net - the LMS's single-sign on solution), and previous successful experiences (in academia, as well as learning related projects) acquired by the partners' technical teams.

Plugins and different customizations were integrated in order to incorporate into the VMLH, key project items such as Mahara, Open Badges, Blockcerts or the e-assessment tool (see Figure 2).

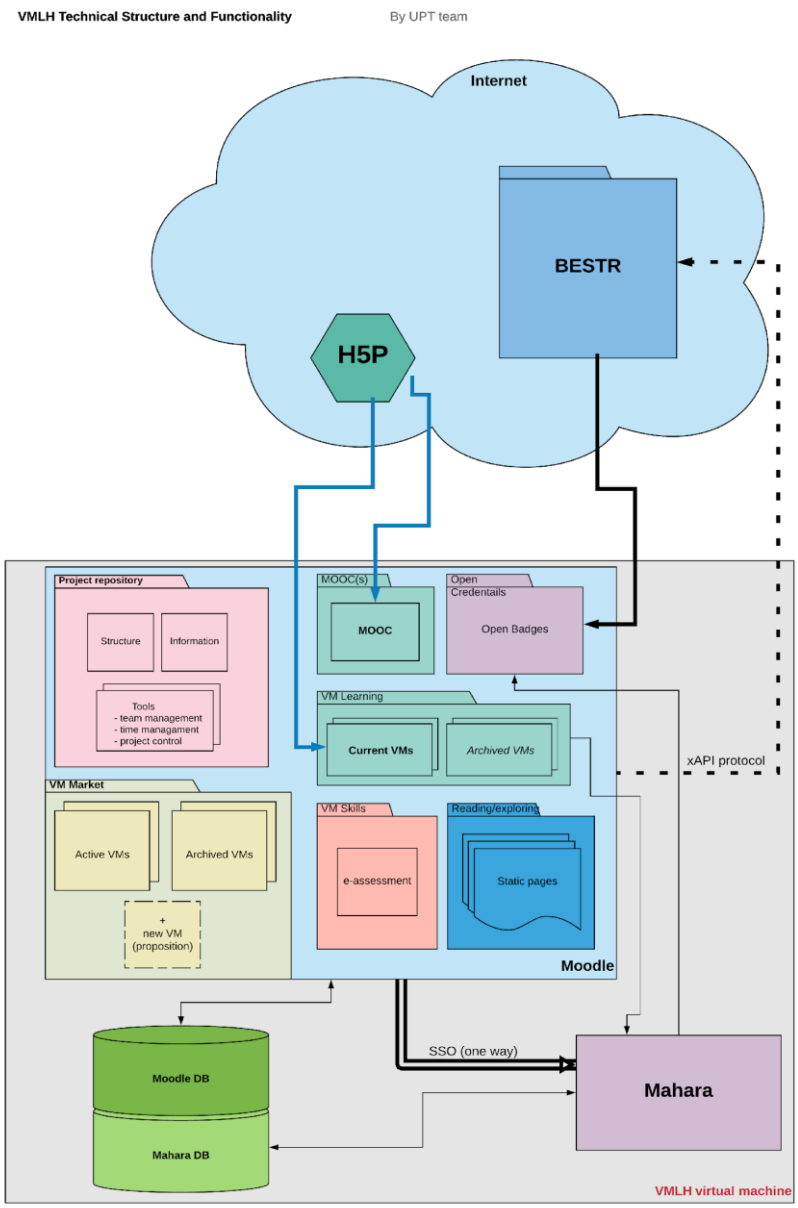

Figure 2 VMLH Technical Structure and Functionality

All tools were tested during the initial piloting phases with users from all project countries and validated one by one. The graphical interface of the platform was an ongoing work, as we developed and improved this at the suggestions of both project partners and also users testing the hub. Several other functionalities were integrated after discussions in partner meetings. The final OpenVirtual

Mobility Interface is based on the project graphics and the user evaluation, all the while allowing for further improvements, after the project end date.

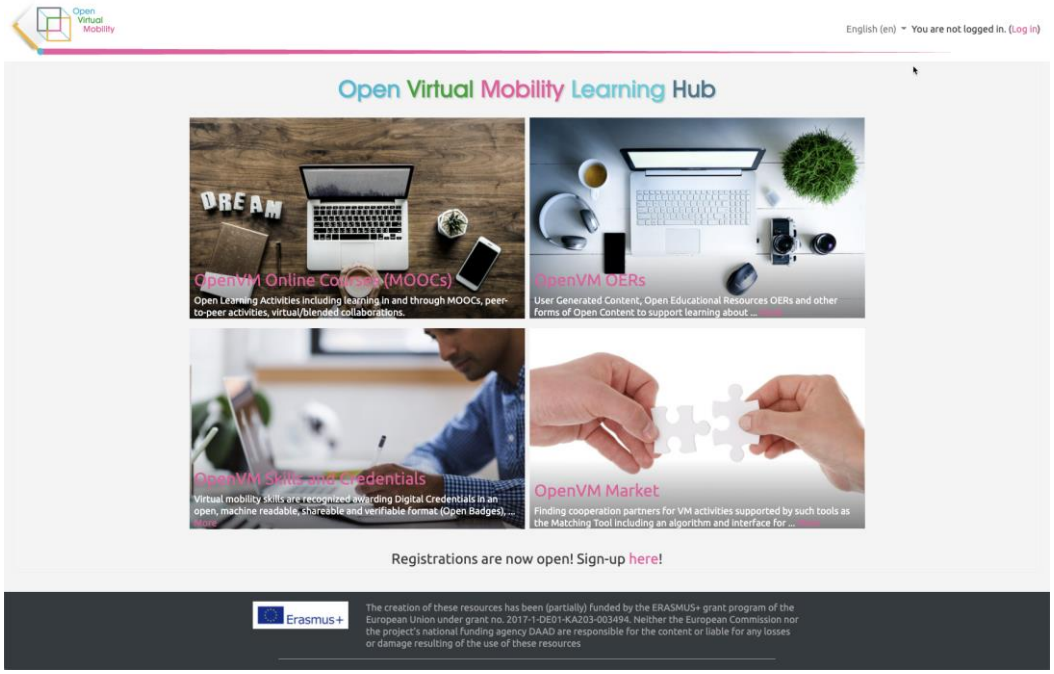

Figure 3 The Virtual Mobility Learning Hub landing page

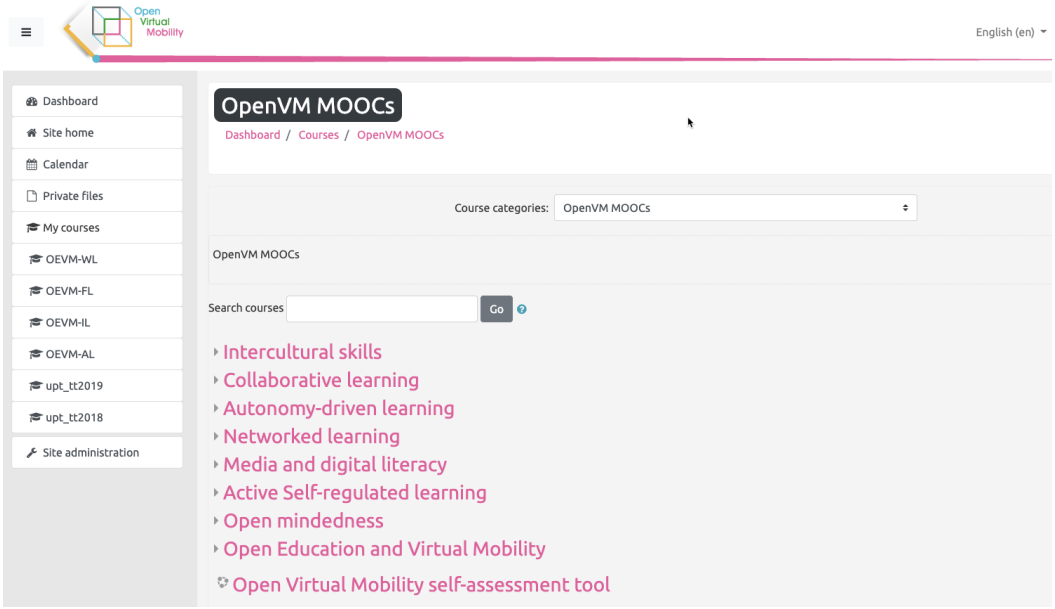

Figure 4 The list of OpenVM MOOCs available on the Hub

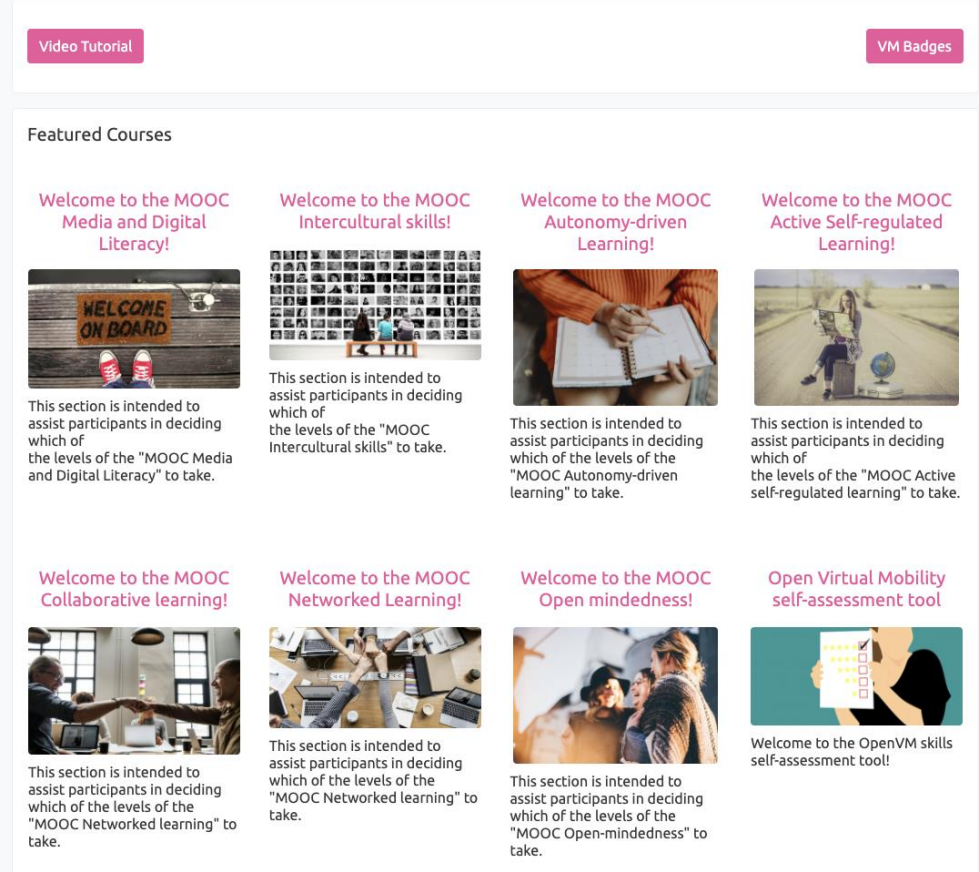

Figure 5 Open Virtual Mobility Learning Hub featured courses

Further, we integrated the MOOCs and OERs in the VM Learning Hub which incorporates several components and technologies as it was described in the *O2A1 LH Concept*. Even from the VMLH Frontpage, users can access the main MOOCs available on the platform through the *Featured Courses* block. A short description and an evocative image are provided for each of the 8 available courses, which can be accessed by clicking the MOOC's title. By navigating through the VMLH interface, users can also access the OpenVM MOOCs category, which lists all of the available courses, regardless of their inclusion in the Featured Courses block (which can be done manually). Each of the MOOCs has an introductory paragraph, highlighting it's target audience, prerequisites and rewards. The landing page of the MOOC also provides direct links to the four components each of the MOOCs is comprised of:

- The Welcome section
- The Foundation level
- The Intermediate level
- The Advanced level

Except for the Welcome section, all the other levels provide their own badge upon completion by students. That badge is displayed on the right column of the course and is greyed out (via transparency manipulation by Cascading Style Sheets - CSS) until the current student acquires it.

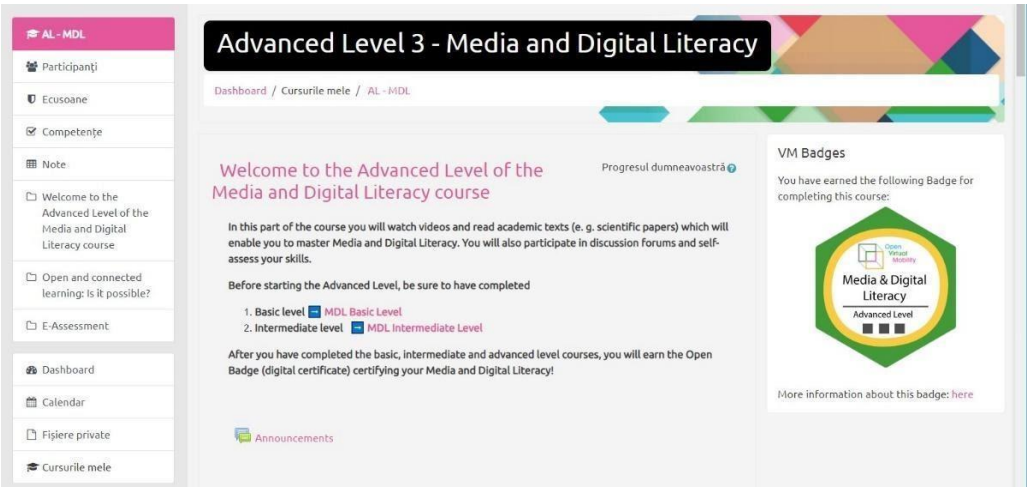

Figure 6 Example of a badge already obtained

Open Educational Resources have been integrated in the VMLH as independent modules inside the courses). Mostly, they have been produced using H5P; a method to create, share and reuse interactive content. There are currently more than 300 OERs integrated in the VMLH. They are listed in the OER section of the website[2].

More details about MOOC and OER integration can be found in our *02-A2.3 VIRTUAL MOBILITY LEARNING HUB WITH INTEGRATED OERS AND MOOCS* report[3].

In parallel with the development of the hub we also developed the VMLH mobile app. The OpenVM application was created by integrating the open-source Moodle Mobile application and it has been configured to work with the Open Virtual Mobility Learning Hub. OpenVMLH mobile app main features are:

- Easily access course content - browse the content of OpenVM courses, even when offline
- Connect with course participants - quickly find and contact other people in OpenVM courses
- Keep up to date - receive instant notifications of messages and other events,
- Post in forums, submit assignments and answer assessment tests in OpenVM courses
- Track progress - View completion progress in OpenVM courses and access badges

[2] https://www.openvirtualmobility.eu/oer/

[3] https://www.openvirtualmobility.eu/outputs/1095-o2-learning-hub/

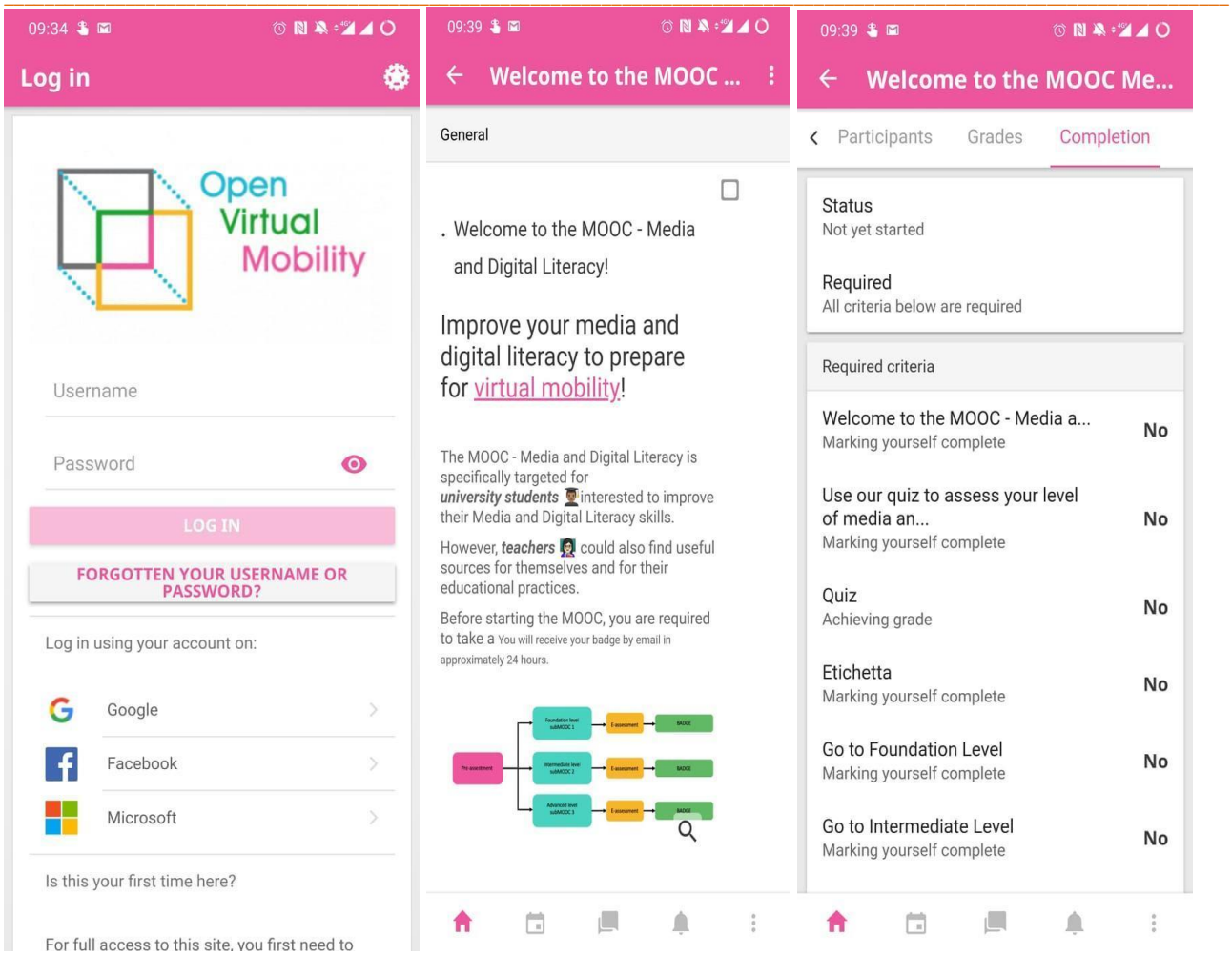

Figure 7 Open Virtual Mobility Learning Hub mobile app

Our next step was the usability evaluation process of both the hub and the mobile app. This was based on common work between all partners of the OpenVM project. It was performed as part of the **O2-A3 Evaluation**. During the testing, several standardized usability methods were conducted: observation sessions, think aloud, error testing and focus groups. Based on the errors encountered, problems raised during the evaluation were solved and solutions identified. Proper changes were made both on the platform and in the MOOC courses with help from all project partners. The platform was also tested by eLearning experts, who offered valuable feedback which helped us improve the hub and mobile app.

From a technical point of view, the UPT team continuously modified the platform according to the problems identified. From a pedagogical point of view, the UPT team supported each partner's course tutors to make changes according to the problems identified.

Analyzing the update report we provided, through discussions amongst all partners, we could conclude what KPIs were reached already in 2019 and which areas the project partners needed to further work on.

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Several user guides were created in order to better help users of the VMLH.
For more details and references to the user guides please refer to *VMLH Usability Report (Online and Mobile), VMLH Update Report* and *VMLH User Guides* [4].

4. Conclusion

The VM Learning Hub was created as an online and mobile learning environment with technologies, innovative forms of skill recognition with Open Credentials (e. g. Open Badges, Blockcerts) and innovative forms of collaboration (e. g. algorithm-based matching of learning groups with the Matching Tool), captivating and engaging learning experience (e. g. using meaningful gamification), and flexible forms of learning and collaborating (e. g. VM Mobile App).

The final prototype of the VMLH was reached after several evaluations made by project partners and users. It was continuously in use since 31 August 2018 and is updated and maintained by the UPT team primarily.

5. References

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Attachments

none

[4] https://www.openvirtualmobility.eu/outputs/1095-o2-learning-hub/