Open Virtual Mobility
Open VM Competence Framework
Final draft

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Executive summary

To establish the conceptual framework on Open Virtual Mobility learner skills and competences a study was conducted involving experts on both Virtual Mobility and Open Education. This study was aimed at answering two questions: which skills and competences do learners acquire and build when participating in Open Virtual Mobility Activities and which contextual factors determine Open Virtual Mobility Activities?

Using a Group Concept Mapping (GCM) methodology, the authors have defined a learner competence framework comprising of 8 competences that are relevant for and developed in OpenVM activities. These competences are:

- Intercultural skills & attitudes
- Networked learning
- Active self-regulated learner skills
- Media and digital literacy
- Autonomy-driven learning
- Interactive and collaborative learning in an authentic international environment
- Open-mindedness
- Gaining Knowledge of Virtual Mobility and Open Education

Additionally, the study identified three topics concerning contextual requirements and facilities for Open Virtual Mobility in higher education. These are:

- Individual characteristics and learning/study behavior of the student
- Institutional support in providing information and access to the student
- Design of OpenVM activities

The statements in these last three clusters point towards both personal (individual) and institutional micro and meso-level perspectives (design, support and access).

The distinction that is thus demonstrated provides an unambiguous answer to the research questions posed for this GCM study, namely what skills and competences learners acquire and build when participating in Open Virtual Mobility Activities and what the contextual determinants should be considered when implementing Open VM. The answer is based on the contributions of a representation of European experts with theoretical and practical experience in virtual mobility. Since experts are practically unanimous on pointing out to these skills as relevant separate entities that constitute the skills of learners, participants of open virtual mobility, these skills form a plausible point of departure in building a framework of OpenVM skills.

The paper presents the OpenVM competence framework with its eight learner competences. It gives some background on the study that was conducted to define the competence framework, and goes into much detail on the competences are part of the OpenVM competence framework. This paper addresses the concepts of Virtual Mobility and Open Education, and how they interrelate.

This paper is intended for anyone interested in Open Virtual Mobility Activities, and the learner competences that can be developed with such activities.

Contributors

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All participants of the GCM study

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1. Aims and Scope

This output presents the Open VM competence framework including the underpinning in the form of a research study that led to the construction of the framework. It discusses the 8 competences comprising the OpenVM competence framework in detail. The framework will be further validated and developed based on the mapping with existing competence frameworks as well as on the outcomes of the OpenVM project.

2. Background and rationale

Internationalization has been a key theme for many decades in higher education. Multiple governmental schemes across the world have invested in creating offerings of high quality education, with collaborations across national borders (Varghese, 2018). One of the concepts related to implementing internationalization of higher educational curricula, particularly in the European Higher Education Area, is the concept of Virtual Mobility (VM), defined as "a set of ICT supported activities, organized at institutional level, that realize or facilitate international, collaborative experiences in a context of teaching and/or learning" (Erasmus + programme guide, 2018).

VM is a form of mobility between two or more (often European) higher education institutions, supported by a curricular, legal and institutional framework. Through VM, learners enrolled as students in one higher educational institute have the opportunity to follow a course at another higher educational institute in the online mode. As this is institutionally supported, VM participants enjoy the formal advantages of studying at that other institute, such as instructional support and assessment of their performance in the course. Also, the gained credits for a successfully completed VM course are accepted by the students' home institutions and recognised as part of the curriculum. VM can take a variety of forms ranging from taking regular courses to virtual seminars, virtual internships, virtual campusses and other forms of virtual learning and collaboration on which students from partner universities can take part (Bijnens, e.a., 2006).

To support this form of student learning and mobility, the student, the home institution and the "virtually" visited institution make use of a Learning Agreement as an instrument, that stipulates the rights and duties of each party in the agreement (Ubachs & Henderikx, 2018).

In the last two decades, there has been an upsurge in open online learning developed and offered by a range of higher education institutions, including the world most prestigious universities (Yuan

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& Powell, 2013). Most notably, Massive Open Online Courses (MOOCS) and Open Educational Resources (OER) have significantly influenced the global educational scene in the last years (Jansen & Schuwer, 2015; Orr, Weller & Farrow, 2018).

Universities invest in online and blended learning in Open Education formats for diverse purposes, including the idealistic goals of reaching out to young people (e. g. in developing countries) who do not have traditional opportunities to participate in higher education, thus improving accessibility and lowering the barrier to high quality education for millions. They see the potential of open online education and OER in innovating higher education, developing and testing new designs and new educational formats. Furthermore, open online courses are used by universities to present and promote their curricular offering (Castano Munos, e.a., 2016; Hollands, & Tirthali, 2014; Kiers, 2016).

Momentarily, Virtual Mobility as a form of cross-border online learning and Open Education, which is both online and borderless by default, notwithstanding their significant similarities, are two distinctly different strands, each with its own rich potential of contributing to the internationalization of higher education (Daniel, 2012; Ubachs & Henderikx, 2018). In the Open Education philosophy the learner determines where and what to study, how much time and effort to invest and with what result (Henderikx, Kreijns, & Kalz, 2017; Hew & Cheung, 2014). In Virtual Mobility, the contracts between institutions determine the respective "whats" and "hows" (Ubachs & Henderikx, 2018).

The 21st century educational landscape evolves towards new formats that overcome the rigid distinctions that used to dominate higher education (Wiley & Hilton III, 2009). Universities develop online courses and encourage students to follow them as part of their curricula or preparation to regular courses, consortia of universities develop and run online courses together, organize virtual learning activities and facilitate student exchanges within consortia (de Kraker, Cörvers & Lansu, 2014, Nascimbeni, e.a., 2018). Students use of a plethora of educational resources with or without formal institutional approval.

Opening up of formal education, the development of diverse "blends" between formal and open education is of particular importance from the perspectives of global citizenship and lifelong learning. An example of the global citizenship perspective are Virtual Exchanges which focus on communication and interaction between geographically separated individuals and/or groups with the support of educators and/or facilitators in order to increase awareness of environmental issues, promote intercultural understanding, global citizenship, digital and language literacy (e.g., de Kraker, Cörvers & Lansu, 2014). In the digital 21st century further development of knowledge, skills and competences acquired within the initial higher education will take place in various constellations of social and professional communities and networks, workplace learning both on- and offline, locally and elsewhere, without borders, through commercial and open courses, offline

and online open resources and practices (Cronin, 2017; Tovar Caro & Lesko, 2014). The higher education will inevitably undergo further changes integrating, "blending" online courses and quality resources produced elsewhere in their curricula.

In this highly dynamic context, re-conceptualizing Virtual Mobility against the backdrop of Open Education increases the sustainability of this form of learning.

In the frame of the Erasmus+ strategic partnership Open Virtual Mobility (OpenVM) 9 European partner organisations from higher education set the goals of developing a shared understanding of the concept of OpenVM and its core characteristics. The opportunities of virtual mobility are still rarely used by higher education leaders, educators, students in Europe mainly due to the limited availability of online courses, caused by a lack of knowledge, skills and experience. Open Virtual Mobility partnership addresses these challenges and aims at enhancing the uptake of virtual mobility in higher education by improving VM skills and in consequence VM readiness by creating a European Virtual Mobility Learning Hub for achievement, assessment and recognition of VM skills (Buchem at al., 2018).

In conformity with the learner-driven philosophy of Open Education, the focus is put on the learner: on the prerequisites that should be in place for the learner to benefit from OpenVM and on the learner skills and competences that OpenVM supports.

To establish the conceptual framework on Open Virtual Mobility learner skills and competences a study was conducted involving experts on both Virtual Mobility and Open Education. This study was aimed at answering two questions:
-   Which skills and competences do learners acquire and build when participating in Open Virtual Mobility Activities?
-   Which contextual factors determine Open Virtual Mobility Activities?

3. Methodology

To answer the research questions the Group Concept Mapping (GCM) methodology was applied (Kane & Trochim, 2007). GCM can be used to collect and organize ideas of individuals so that collective understanding of a concept can be reached and to be further knowledge development, design activities and /or decision or policy making could take place.
Data generation and analysis in GCM is a structured multi-step mixed-method approach in which advanced statistical analyses are applied to qualitative data to identify patterns in the data. The output of this analysis are maps representing a collective standpoint of all participants on the studied issue. Such maps are then used to validate the shared understanding with study participants and in order to formulate further actions or strategies (Kane & Trochim, 2007).

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Participants

Expertise on and affinity with the Virtual Mobility and Open Education on the conceptual level or in the educational practice formed the pre-requisite of the participation. Such experts are scarce, therefore for each phase in the study additional recruitment was undertaken to complement the expertise within the OpenVM project. Each project partner invited experts from their respective national networks for brainstorming, sorting and rating. OE Global conference (oeglobal.org) was used as the venue for validation and the outcomes were finalized in a focus group with experts linked to the Open VM project. A total of 49 participants took part in at least one phase of the study with 32 participants completing all phases. All are experts in the domains of virtual mobility and/or open education with experience in higher education as university professors or education management and support.

A detailed overview of participants, their background characteristics and the level of particpation is provided in Output 2.

Instruments

The GCM online environment (https://conceptsystemsglobal.com/) was used for data generation and analysis. Printouts of the generated visual representations of the results (various maps) were used at the validation and interpretation workshop.

Procedure

(1) **Recruiting participants.** All OpenVM project members were invited to participate in the study and were requested to share the invitation with their respective networks including representatives of the research community, educators, internationalization officers at Higher Education Institutions, HE boards representatives and policy makers. Project members approached their contacts through e-mail with a reminder in case of non- response and invited to participate in the sorting and rating activities through the online tool. Informed consent request was requested through the GCM tool.

(2) **Idea generation.** Idea generation was steered by the focus prompt. "Please, complete the statement "In the context of Open Education, Virtual Mobility implies that students …. ". Participants were invited to give as many answers as they wished in the form of short direct statements. In total 101 statements were generated in the idea generation phase of the study.

(3) **Data cleaning and removal duplicates.** All duplicate statements were removed. Statements were checked for repetition or ambiguity issues by two project members separately, results were compared and full agreement was reached on statements to be removed. The final set included 90 unique statements.

(4) **Sorting and rating.** Participants were invited to group statements based on their similarity in meaning in meaningful clusters, provide the clusters with meaningful labels and to evaluate each statement on dimensions of importance and feasibility on a scale from 1 to 5.

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(5) **Analysis.** Multi-dimensional scaling (MDS) and hierarchical cluster analysis (HCI) were performed with the GCM tool, and visuals were generated for conceptual analysis, interpretation and validation with the stakeholders. Preliminary data interpretation was performed by the two lead authors in preparation for the validation and consolidation phase.

(6) **Interpretation, validation and consolidation.** Two sessions were held to interpret, validate and consolidate the outcomes of the analysis. An OE Global conference 2018 an Action Lab activity was used as an interpretation and validation workshop. During the workshop visual representations of preliminary clusters, the respective statements and key statistics were presented to the workshop participants who discussed the presented data and provided feedback. Contributions of the participants were written down and analyzed by the lead authors. Based on the outcomes of the validation workshop an overview of the clusters with tentative labels was made to support the final step - a consolidation workshop that was held with 5 selected project members with both theoretical and practical expertise on VM. The outcomes of the consolidation workshop are considered final results of the GCM study.

4. Results

Point map of the GCM outcomes

90 statements generated in GCM are presented in a detailed point map at figure 1. On this point map each point stands for one unique statement of the final set of 90 statements.
Statements that are sorted together by more participants are located closer to each other.
Kruskal's stress value statistic indicates the goodness of fit of the data, the extent to which the data point map represents the way individuals sorted the data. Less stress value is an indication of a better fit which should be in the range between 0.205 and 0.365 (Kane & Trochim, 2007). In this study the stress value constituted an goodness of fit of acceptable level of 0.2531.
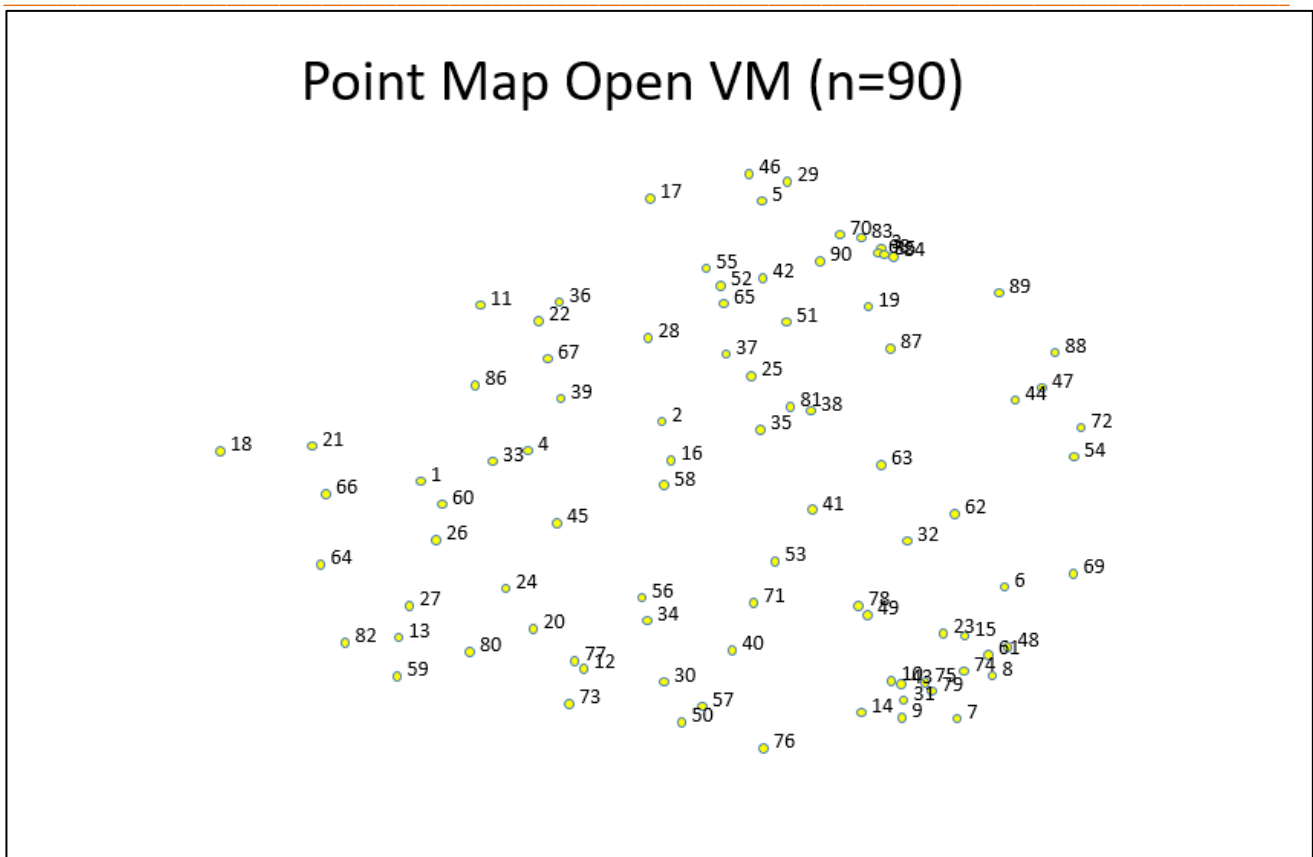
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Open Virtual Mobility, Output O1-A1, 6 November 2018   #openvirtualmobility @openVM_erasmus

Figure 1 The outcomes of the Group Concept Mapping study on OpenVM: the point map of 90 statements.

Clusters

Figure 2 presents a 10-cluster solution that resulted from the sorting activity based on the MDS and HCI, and supported by analysis of the bridging value statistic and the outcomes of the validation workshop. The choice of the 10-cluster solution is also supported conceptually.
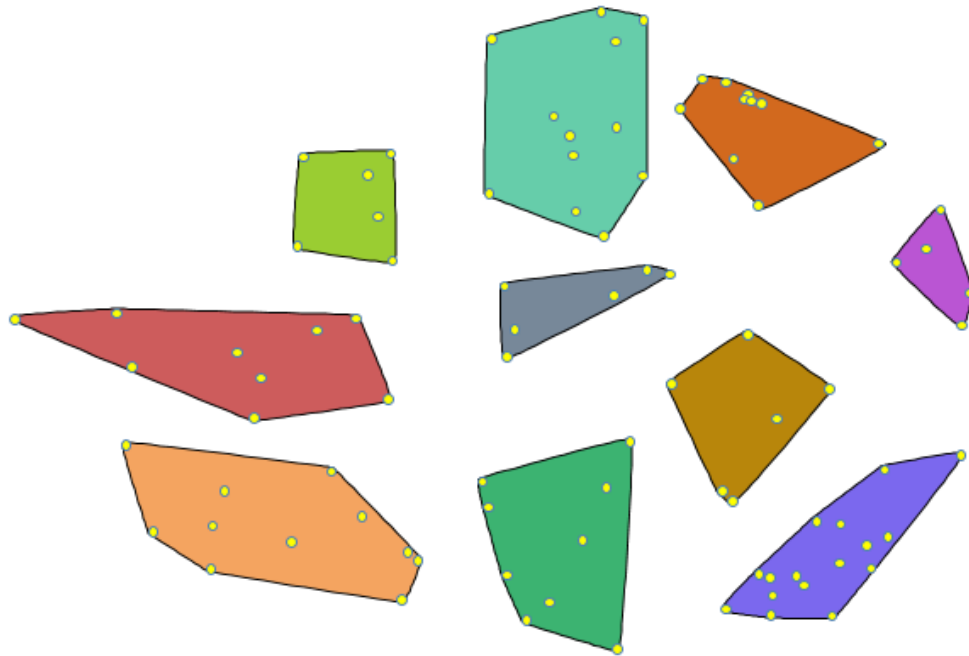
Figure 2. The outcomes of the Group Concept Mapping study on OpenVM: a 10- cluster solution

Labels

The GCM tool suggested "a best match" labels to the clusters that were used to steer discussion at the validation workshop. The final labels resulted from the expert consolidation session based on agreement of all 5 participating experts. Figure 3 is a visual representation of the clusters with the respective labels. Table 3 shows the clusters with their labels and exemplary statements per cluster.

Open VM conceptual model
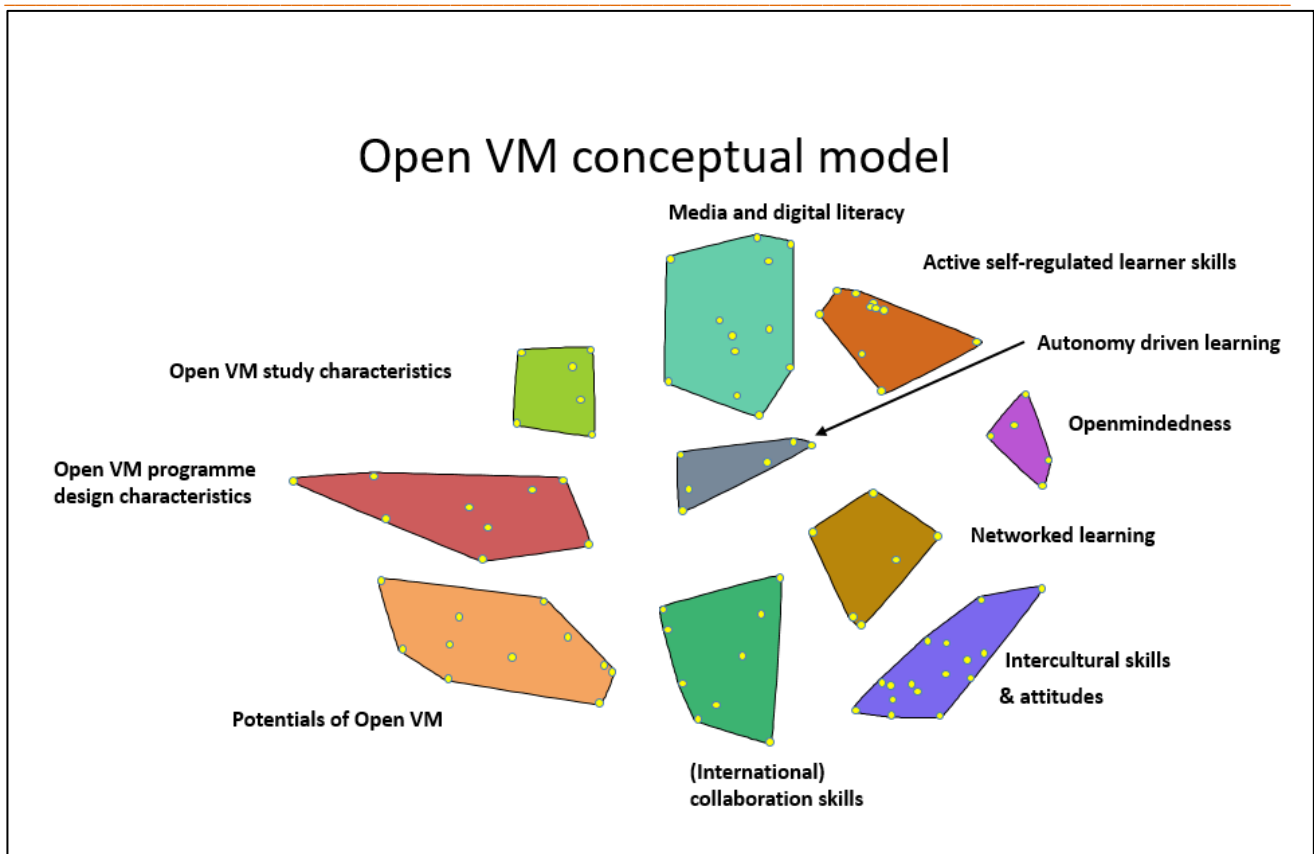
Bridging value statistic: clusters as anchors and bridges

GCM makes use of the bridging value statistic which is based on the calculation of how often (i.e., by how many participants) a particular statement has been grouped together with other statements in relation to the distance between these statements. A low bridging value indicates that an item is sorted with nearby statements on the map while high values (nearing 1) imply that participants sorted a particular statement with statements far on the map. A cluster bridging index is an average of the values within the cluster. Bridging value index of the cluster indicates to what extent a cluster is a consistent and coherent entity, separate from other clusters. The higher the bridging value, the more the cluster and its constituent elements (statements) are connected to other clusters and statements in other clusters. In the 10-cluster model of Open VM, the average bridging values vary from 0.12 to 0.54 as presented in Table 3.

As the table 3 demonstrates, most of the clusters on the Open VM cluster map has low to very low bridging value. That means, that they form consistent independent clusters. Three clusters have higher bridging value, indicating that these cluster and their consistent components are closely connected to statements in other clusters.

Thus, the 10 cluster solution includes clusters with low bridging values (the so called anchor clusters) and clusters with higher bridging values (the so called bridges). There is a high great level of agreement between the GCM participants on clusters 1, 2, 3, 4, 5 and 6. As labels of the clusters indicate, these clusters describe the skills that learners develop in Open VM and the skills that they

need to succeed in Open VM. Cluster 7 (open-mindedness) which has a higher bridging value describes an attitude. The three remaining clusters, also with higher bridging values are more related to external aspects of Open VM such as Open VM programme characteristics or pre-requisites of VM.

Table 3. Open VM clusters with exemplary statements per cluster with their respective bridging values

Cluster with per cluster exemplary statements with their respective bridging values as an answer to the prompt **In the context of Open Education, Virtual Mobility implies that students [develop]…**	M bridging values (SD)	N statements per cluster
1. Intercultural skills & attitudes • gain knowledge about the culture they "visit" • have exposure to different working and cultural backgrounds, which could raise both new potentials and barriers at the same time • feel confident in interacting with people from other cultures after a VM experience	0.12 (0.13)	16
2. Networked learning • learn to work and cooperate in an international setting with the use of ICT and social platforms • learn about dealing with complex situations through the VM activity • learn about dealing with ambiguity through the VM activity	0.25 (0.05)	6
3. Active self-regulated learner skills • should be able to plan and organize their own learning process • are able to self-reflect • aims of VM in student development -self-discipline in learning	0.16 (0.13)	10
4. Media and digital literacy • are proficient in searching for good quality courses and resources • are digitally literate • are proficient in using digital platforms	0.22 (0.08)	12
5. Autonomy-driven learning • develop persistence and creativity in organizing their own study. i.e., They might need to find suitable and feasible courses on their own and convince curriculum boards of the quality of learning in OE contexts • can enhance their lifelong learning skills • can learn in an open digital context	0.21 (0.07)	6
6. Interactive and collaborative learning in an authentic international environment • exchange knowledge with peers from different disciplines • collaborate with peers from different disciplines • the open digital context facilitates collaboration about international students	0.31 (0.07)	9

7. Open-mindedness • are open minded • are not afraid of interacting with peers and teaching staff at other institutions • are willing to improve their proficiency in foreign languages	0.53 (0.07)	5
8. Potentials of Open VM • have access to high quality learning processes that otherwise would not be possible for them • do not have to pay any fees for attending a virtual mobility course of a foreign institution • receive academic recognition for participating in virtual mobility	0.39 (0.11)	9
9. Open VM study characteristics • carry out the learning process under the characteristics of open education • students create their digital identity through the open context • using IT tools in a transparent and efficient way to interact with other participants and the learning material	0.53 (0.11)	6
10. Open VM programme design characteristics • are involved in predetermined learning activities, open and collaborative, through which they can acquired knowledge thanks to innovative learning methods • the construction of a well-defined learning path in which collaborative and international activities are pivotal • needs guidance and support to make the right choices and to stay motivated	0.54 (0.20)	8

Open VM skills and competences and external factors

As figure 4 demonstrates, the 10-cluster solution of the GCM applied to the concept of Open VM indicates that the conceptual framework includes both learner characteristics (skills and competences) and external factors.
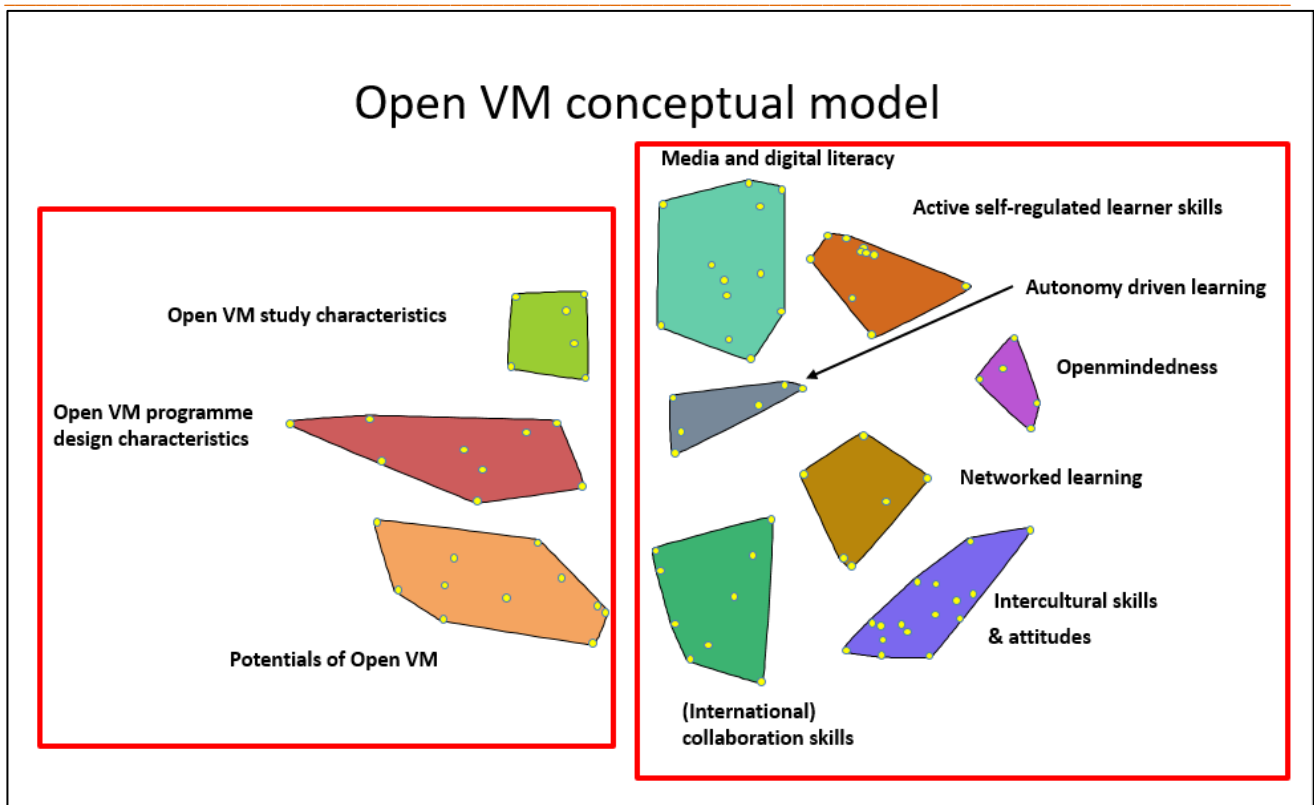
Figure 4 Open VM conceptual framework and its constituent parts.

To sum up, according to the conducted GCM study, Open Virtual Mobility activities encourage the development of 7 learner skills and competence areas. These are:

- Intercultural skills & attitudes
- Networked learning
- Active self-regulated learner skills
- Media and digital literacy
- Autonomy-driven learning
- Interactive and collaborative learning in an authentic international environment
- Open-mindedness

The statements in three clusters point towards both personal (individual) and institutional micro and meso-level perspectives (design, support and access).

- Individual characteristics and learning/study behavior of the student
- Institutional support in providing information and access to the student
- Design of OpenVM activities

The distinction that is thus demonstrated provides an unambiguous answer to the research questions posed for this GCM study, namely what skills and competences learners acquire and build when participating in Open Virtual Mobility Activities and what the contextual determinants should be considered when implementing Open VM. The answer is based on the contributions of a representation of European experts with theoretical and practical experience in virtual mobility. Since

experts are practically unanimous on pointing out to these skills as relevant separate entities that constitute the skills of learners, participants of open virtual mobility, these skills form a plausible point of departure in building a framework of OpenVM skills.

Open VM competence framework

Based on the outcomes of the GCM study and in conformity with the aims – to provide underpinning for design and development activities in the project the seven skills and competence areas were described including their constituent skills and subskills.
Furthermore, an additional competence area on the knowledge of the concept of Virtual Mobility was added.

The eight skills and competences areas are described as follows.

1. Intercultural skills and attitude

Intercultural skills and attitude		
Developing intercultural skills and attitude implies that the student acquires cultural knowledge and a better understanding of cultural perspectives, including understanding of own cultural identity, that the student enhances and demonstrates cultural understanding and can apply intercultural awareness in culturally challenging circumstances		
Gaining cultural knowledge - Gain knowledge about the culture they "visit" - Get to know other cultural-based perspectives of education	*Understanding cultural perspectives* - Improve understanding of intercultural issues at general and disciplinary level - Get a feeling of how learning (or teaching) is like in a different country	*Enhancing own cultural identity* - Gain knowledge about own culture - Become self-aware of their own cultural identity
Enhancing cultural understanding - Gain international, intercultural experiences - Experience different cultural settings (in all its facets) through online courses - Exposure to different working and cultural backgrounds	*Demonstrating cultural understanding* - Direct interaction with peers from other cultural settings during VM activities - Exchange knowledge with peers from different cultural settings - Be able to deal with intercultural issues	*Applying intercultural awareness in culturally challenging circumstances* - Learn to reserve judgment on the people you work with, to avoid cultural misunderstandings -Become self-aware of the cultural prejudices - Can deal with intercultural issues Feel confident in interacting with people from other cultures

2. **Interactive and collaborative learning in an authentic international environment**

Interactive and collaborative learning in an authentic international environment:
Interactive and collaborative learning in an authentic international environment implies that the student develops teamwork skills, collaborates with peers across disciplines and contexts, acquiring new international learning experiences and interacting with authentic international tools, systems and resources in a foreign language.

Enhanced team work skills	*Collaborating with peers from different disciplines*	*Collaborating with peers within the context of an international learning experience*	*Interacting with authentic international resources in a foreign language*
- Enhance team work skills	- Exchange knowledge with peers from different disciplines - Interact and collaborate with peers from different disciplines	- Experience different learning methodologies - Have a learning experience different from learning offline and in own country - Collaborate in the open digital contexts	- Interact with libraries and databases, in other countries in a foreign language - Access to and use of authentic resources in a foreign language
Enhanced team work skills	*Collaborating with peers from different disciplines*	*Collaborating with peers within the context of an international learning experience*	*Interacting with authentic international resources in a foreign language*
- Enhance team work skills	- Exchange knowledge with peers from different disciplines - Interact and collaborate with peers from different disciplines	- Experience different learning methodologies - Have a learning experience different from learning offline and in own country - Collaborate in the open digital contexts	- Interact with libraries and databases, in other countries in a foreign language - Access to and use of authentic resources in a foreign language

3. Autonomy-driven learning

Autonomy-driven learning:
Being able to learn in an autonomy-driven way implies that the student self directs, and regulates own learning process, independently chooses in what mode or context to study, what tools to (learn to) use and how to organize the learning process

Demonstrating self-directedness in decision-making on own learning	*Demonstrating independent learning*
- Develop learning self-regulation strategies - Develop persistence and creativity in organizing one's own study	- Be able to study in a flexible way, independent of time and place - Enhance lifelong learning skills - Adapt and further develop knowledge of Open Education ICT tools - Learn in an open digital context

4. Networked learning

Networked learning:
Being able to learn in networked way (= engage in networked learning) implies that the student is able to use digital networks in/for learning and communication in international contexts or environments and is able to tackle complex, ambiguous and ill-defined issues and situations in (emerging or existing) social networks

Engaging in digital networking	*Dealing with complexity in networked learning*
- Be able to use networks (being "networking savvy") for learning - Learn to work and cooperate in an international setting with the use of ICT and social platforms - Enhance international and digital competence	- Cross boundaries in learning - Learn how to deal with complex situations - Learn how to deal with ambiguity

5. **Media and Digital Literacy**

Media and Digital Literacy:		
Media and Digital Literacy implies that the student is able to use resources effectively to learn, can assess the quality of resources and demonstrates "learner control		
Demonstrating learner control - Bring a high level of self-regulation competency to the online collaboration aspect - Set one's own learning objectives - Organize content and schedules	***Being proficient in using online learning technologies*** - Awareness of the differences between on- and offline - Proficiency in searching for new courses & resources and - Proficiency in using digital platforms - Proficiency of independent use of tools for online communication	***Being proficient in assessing quality in courses and resources found online*** - Proficiency in assessing course and OER quality

6. **Active self-regulated learner skills:**

Active self-regulated learner skills:		
Being an active self-regulated learner implies that the student is able to self-regulate own learning process, can reflect on learning experience and one's own progress and can demonstrate that he/she has the agency of one's own learning.		
Being able to self-regulate learning processes - Be self-responsible - Be self-disciplined - Be able to plan & organize one's own learning - Be pro-active	***Being able to self-reflect on learning experiences*** - Be able to reflect on one's own learning process - Be communicative	***Demonstrating ownership over own learning (attitude)*** - Being motivated to learn - Be constructive towards the course goal. - Have both digital and cultural competences

7. **Open-Mindedness**

Open-Mindedness		
Open-Mindedness implies that the student is tolerant to others, has an open attitude towards others, demonstrates willingness to improve knowledge (of foreign languages) and demonstrates self-confidence in interaction with peers and teachers.		
Being open-minded and tolerant - Be open-minded - Be tolerant	***Demonstrating self-confidence in interaction with peers and teaching staff*** - Be not afraid of interacting with peers or teachers at other institutions	***Show willingness to improve proficiency in foreign languages*** - Be proficient in foreign languages - Be willing to further improve proficiency in foreign languages

Gaining Knowledge of Virtual Mobility and Open Education	
Gaining Knowledge of Virtual Mobility and Open Education implies that the student displays a higher level of understanding of the work forms, contexts and collaboration modes that the student engages with during a Virtual Mobility activity, an Open Education activity or an OpenVM activity.	
Understanding Virtual Mobility	*Understanding Open Education*
- Demonstrate understanding of Virtual Mobility models	- Demonstrate understanding of Open Education models
- Improve understanding of opportunities created by Virtual Mobility context	- Improve understanding of opportunities created by Open Education context

5. Discussion

Next steps in the development of the Open VM framework necessarily include a perspective on established competence frameworks. The competences emerging from the GCM study on OpenVM activities are related to skills and competences defined in well-used existing competence frameworks. Most notable is the European Reference Framework on Key Competences for Lifelong Learning of ESCO (European Skills, Competences and Occupations, ESCO, 2018). However, OpenVM competences are notable in that they are complex competences, where their uniqueness emerges from their specific combination of skills, and situation in the VM or open setting. A suitable validation exercise for the results of this study will be a detailed mapping of the OpenVM competences on existing competence frameworks, in order to develop a validated OpenVM competence framework. This is future research envisaged by the lead authors.

The results of this study also pose a clear challenge for teachers, course designers and policy makers in higher education in the current 21st century educational landscape. The breadth of the competences covered in OpenVM activities, as emerging from this study, indicates the need for a complex design of Open Virtual Mobility activities, through which students will be challenged to develop. This also implies the necessary facilities students need to have access to in order to engage in OpenVM activities and thus have rich learning experiences through OpenVM,

This study has some limitations. The experts who participated in in the study are well familiar with the topics of Open Education and Virtual Mobility, they are primarily university teachers or researchers. Other "adult" stakeholders are marginally represented and students, those who form the main target group of OpenVM activities are not represented. Including students in the study might have identified different priorities and interests. Such inclusion may be possible in the context of current VM activities and exchanges in new or existing consortia of universities.

The labels and definitions given to the final 7 clusters remain provisional. We can expect more nuanced descriptions to emerge through further use of the competence framework (foreseen in the OpenVM project).

7. References

Bijnens, H., Boussemaere, M., Rajagopal, K., Op de Beeck, I., & Van Petegem, W. (2006). European cooperation in education through Virtual Mobility – a best-practice manual. Heverlee: EUROPACE izvw.

Buchem, I., Konert, J., Carlino, Ch., Casanova, G., Rajagopal, K., Firssova, O. & Andone, D. (2018). Designing a collaborative learning hub for Virtual Mobility skills – Insights from the European project Open Virtual Mobility. In: P. Zaphiris and A. Ioannou (Eds.) *Learning and Collaboration Technologies. Design, Development and Technological Innovation*. Springer International Publishing AG, Lecture Notes in Computer Science, vol. 10924, pp. 350-376. ISBN 978-3-319-91742-9

Castaño Muñoz, J., Punie, Y., Inamorato dos Santos, A., Mitic, M. & Morais, R. (2016). *How are Higher Education Institutions dealing with openness? A survey of practices, beliefs and strategies in five European countries*. Institute for Prospective Technological Studies. JRC Science for Policy Report, EUR 27750EN; doi:10.2791/709253

Cronin, C., (2017). Openness and praxis: Exploring the use of open educational practices in higher education. *International Review of Research in Open and Distributed Learning, 18* (5). 18-34.

de Kraker, J., Cörvers, R., Lansu, A. (2014). E-learning for sustainable development: linking virtual mobility and transboundary competence. In: Azeiteiro, U.M., Leal Filho, W., Caeiro, S., (Eds.). *E-learning and sustainability*, Peter Lang.

Daniel, J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox and possibility. *Journal of Interactive Media in Education, 3*(0). Retrieved from http://www-jime.open.ac.uk/jime/article/viewArticle/2012-18/html

Erasmus + Programme Guide (2018). Retrieved from https://ec.europa.eu/programmes/erasmus-plus/sites/erasmusplus2/files/erasmus-plus-programme-guide2_en.pdf

ESCO European Skills/Competences, qualifications (2018, October 16). Retrieved from https://ec.europa.eu/esco/portal

Henderikx, M.A., Kreijns, K., & Kalz, M. (2017) Refining success and dropout in massive open online courses based on the intention–behavior gap. *Distance Education, 38* (3), 353-368, DOI: 10.1080/01587919.2017.1369006

Hew, K.F., & Cheung, W.S. (2014). Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges. *Educational Research Review 12*, 45–58.

Hollands, F., & Tirthali, D. (2014). Why do institutions offer MOOCs? *Online Learning, 18* (3). Retrieved from http://olj.onlinelearningconsortium.org/index.php/jaln/article/view/464

Jansen, D., & Schuwer, R. (2015). *Institutional MOOC strategies in Europe.* Status report based on a mapping survey conducted in October - December 2014. EADTU. Retrieved from http://www.eadtu.eu/documents/Publications/OEenM/Institutional_MOOC_strategies_in_Europe.pdf

Kane, M., & Trochim, W. M. K. (2007). *Concept Mapping for Planning and Evaluation*. Thousand Oaks, CA. Sage Publications.

Kiers, J.(2016). MOOCs and their effect on the institution: Experiences in course design, delivery and evaluation; research; faculty development; unbundling and credits for MOOCs. *Foro de Educación, 14* (21), 133-149.

Nascimbeni, F., Burgos, D., Aceto, S., Wimpenny, K., Maya, I., Stefanelli, C., & Eldeib, A. (2018, April). Exploring intercultural learning through a blended course about open education practices across the Mediterranean. *Global Engineering Education Conference (EDUCON)*, 2018 IEEE (pp. 285-288). IEEE.

Orr, D., Weller, M., & Farrow, R. (2018). *Models for online, open, flexible and technology-enhanced higher education across the globe – a comparative analysis*. International Council for Open and Distance Education (ICDE). Oslo, Norway. Available from https://oofat.oerhub.net/OOFAT/. CC-BY-SA.

Tovar Caro, E.; Lesko, I. (2014). Analysis of successful modes for the implementation and use of OpenCourseWare (OCW) and Open Educational Resources (OER) in Higher Education. The virtual mobility case. *Revista Iberoamericana de Educación a Distancia, 17* (1), 131-148.

van Tryon, P. J. S., McDonald, J., & Hirumi, A. (2018). Preparing the next generation of instructional designers: a cross-institution faculty collaboration. *Journal of Computing in Higher Education*, 1-29.

Ubachs, G., & Henderikx, P. (2018). *EADTU Mobility Matrix*, (pp. 26). Maastricht, NL: EADTU. Retrieved from https://tinyurl.com/EADTU-mobility-matrix

Varghese, N. V. (2018). Globalization and Cross-Border Mobility in Higher Education. *Educational Access and Excellence, 1*, 9.

Wiley, D., & Hilton III, J. (2009). Openness, dynamic specialization, and the disaggregated future of higher education. *The International Review of Research in Open and Distributed Learning, 10* (5). http://www.irrodl.org/index.php/irrodl/article/view/1106/1925

Attachments

1. Presentation (ppt) slides given at OEGlobal conference
2. A presentation of the outcomes at Open VM project meeting, Timisoara, 2018