Open Virtual Mobility

Open VM Conceptual Guidelines

- Draft -

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Executive summary

This part of the output aims to translate the OpenVM Competence Framework (O1-A1) into practically applicable conceptual design guidelines/principles. It does so by reviewing existing/running examples of Open Virtual Mobility against the Competence Framework, in order to distill design principles.
As step one in this process one particular case of open Virtual Mobility (TalkTech project) was described against the openVM framework. The paper presents the outcomes of this analysis.
The paper is directed at all stakeholders of Virtual Mobility: students, teachers/university professors and HE institutions officers responsible for international collaboration.

Contributors

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2. Background and rationale

The concept of virtual mobility (VM) implies active engagement in learning together with others, as the Erasmus + program guides speaks of VM "as a set of ICT supported activities, organized at institutional level, that realize or facilitate international, collaborative experiences in the context of teaching and/or learning" (Erasmus + programme guide, n.d.). Learning together, interacting and collaborating with learners from different universities, different cultures and contexts at a distance, with the help of digital and social media enhances the development of transversal skills and competences that may seem peripheral from the core curriculum perspective. Such skills, however, are acknowledged as important 21st century skills (Voogd, & Pareire Robin, 2010). Thus, VM and in particular Open VM that puts the learner central, can provide a genuine surplus value to the university education of the 21st century.
In the highly dynamic context in which different strands of online learning develop in the direction of convergence, 11 European partners set the goal of developing a shared understanding of the concept of Open Virtual Mobility (OpenVM) and its core characteristics in the frame of an Erasmus+ project OpenVM. In conformity with the learner-driven philosophy of Open Education, the primary focus is put on the learner: on the prerequisites that should be in place for the learner to benefit from opening up VM and on the learner skills and competences that OpenVM should and can support (Buchem, e.a., 2018).
To determine the skills and competences that may be involved in Open Virtual Mobility, the OpenVM project initiated a Group Concept Mapping study (Kane & Trochim, 2007) inviting experts on both VM and OE domains throughout Europe to take part in the study.
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 - 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 details of this study and the resulting Competence framework can be found in A1 and A2 of the intellectual output O1.

Figures 1 and 2 illustrate the result.

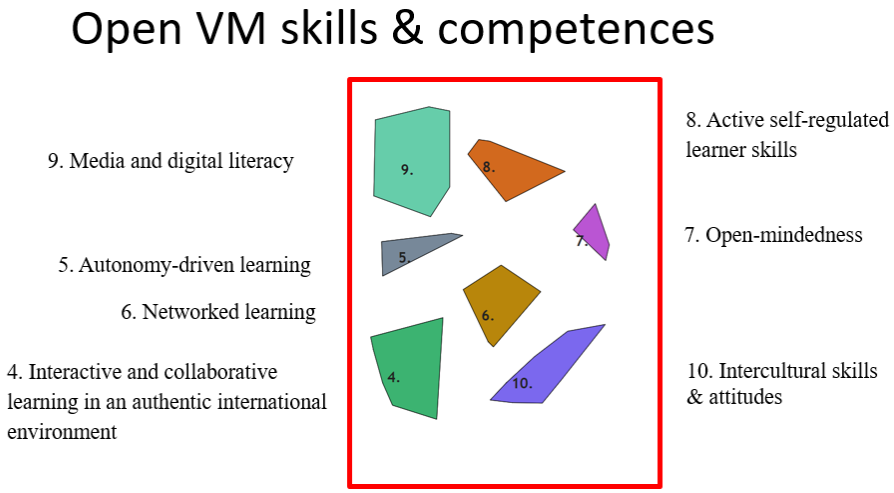
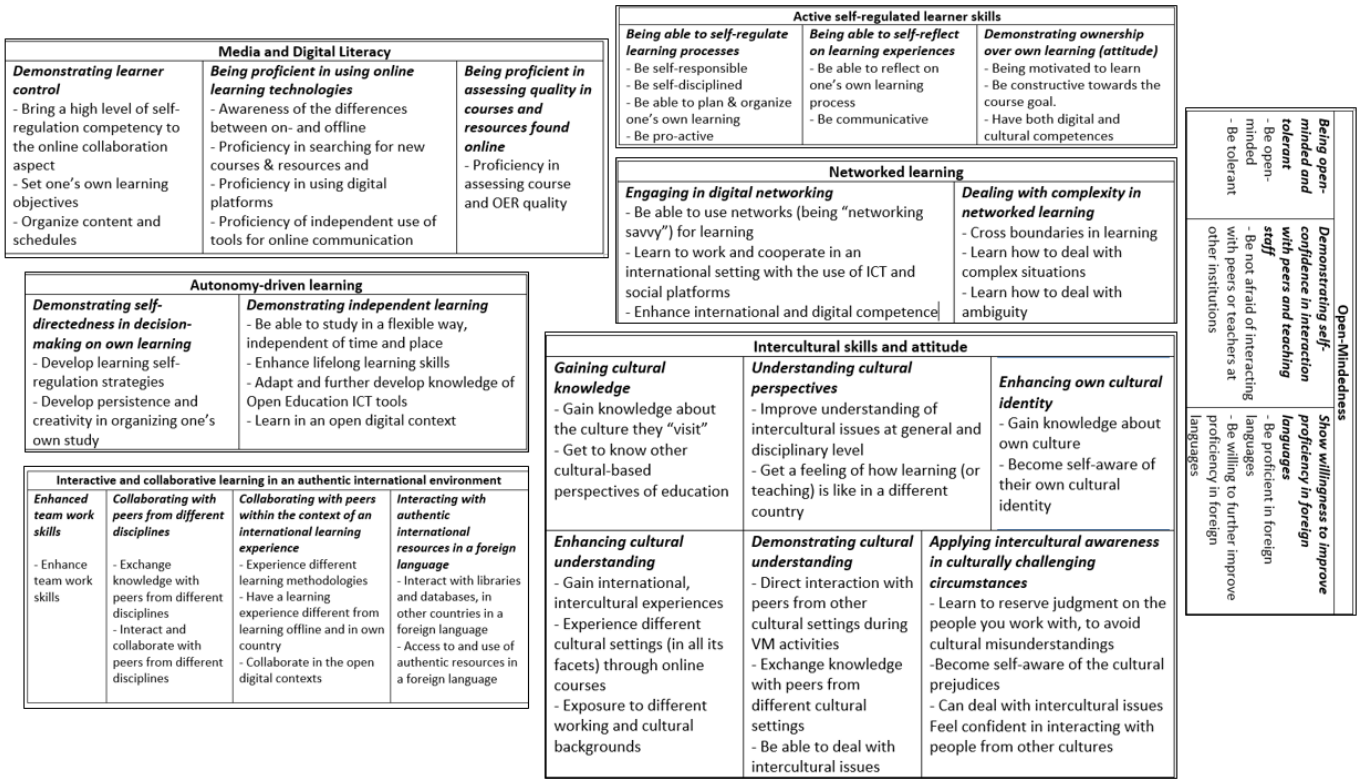


Figure 1. Visual representation of 7 clusters of Open VM skills and competences, resultant from the GCM study.



Media and Digital Literacy		
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

Active self-regulated learner skills		
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

Networked learning	
Engaging in digital networking - 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	***Dealing with complexity in networked learning*** - Cross boundaries in learning - Learn how to deal with complex situations - Learn how to deal with ambiguity

Autonomy-driven learning	
Demonstrating self-directedness in decision-making on own learning - Develop learning self-regulation strategies - Develop persistence and creativity in organizing one's own study	***Demonstrating independent learning*** - 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

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

Intercultural skills and attitude		
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

Open-Mindedness		
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

Figure 2. A 7-cluster Open VM Competence framework including subsequent skills and sub-skills, resultant from the GCM study.

These skills and competences do not necessarily constitute the core curriculum that curriculum designers and university professors explicitly define in their curriculum descriptions other than when specific

pedagogical approaches come to the forefront (i.e., problem-based learning or case-based learning). Therefore, it is difficult to say to what extent learners engaging in VM activities depend upon VM skills to succeed, to what extent they indeed develop these skills and competences and how they benefit from doing VM in short and long run.
This output therefore looks at three research questions that are related:

1. To what extent does the OpenVM Competence Framework cover skills gained in existing/running Virtual Mobility activities?
2. What are the design choices made to support the development of each of the OpenVM skills designed for in the existing/running Virtual Mobility activities?
3. What are the design principles that will support the development of OpenVM skills in OpenVM activities?

3. Methodology

The methodology used is one of abstraction to identify underlying instructional design principles, behind design choices made in VM activities. Starting from existing VM activities, we look at which competences occur in the design of the VM activity, which design choices are made to elicit the development of a particular competence (and how intentional this is), and finally, if these design choices can be grouped to design principles for each competence in the OpenVM Competence Framework.

In the first stage of the project, we started with describing and analysing one case. In the next stage, a series of in-depth interviews accompanied by case descriptions will be held. All cases will be described systematically using the instrument that will be derived from the concept framework.

Data collection

Available literature is collected for each selected VM activity, through their websites, institutional documentation, academic literature etc. Furthermore, participants involved in VM activities (primarily teachers or activity organisers) are interviewed (if required and possible). The data are then organised through two instruments (described below).

Instruments

Two instruments were developed:

1. A template description of the VM activity
2. An analysis framework (spreadsheet) in which per activity and relevant aspects of it (i.e., subactivities), for each competence a description is given and the underlying design prínciple is formulated.

Finally, the competences and related design principles per VM activity is grouped per competence, and a general design principle will be formulated.

Procedure

The research approach consists of two phases. In the first phase a pilot was done, based on a single case. As the OpenVM project continues into its second year, phase 2 activities will take place.

Phase 1: Pilot of the approach based on a single case.

Prior to conducting a systematic analysis, a small-scale pilot was done with the case of one of the project members. Describing the case and mapping it to the Competence Framework provided valuable insights on how further activities should be designed.

- ***Step 1***: A case description was compiled based on the materials provided by the case owner and the background materials.
- ***Step 2***: The Competence Framework was used to map activities and outcomes of the pilot to the competence areas defined by the framework.

Phase 2. Systematic analysis based on the outcomes of the pilot.

- ***Step 1***: Compilation of list of existing/running Virtual Mobility Activities. The criteria for selection are the following:

The VM activity was or is currently running for a number of years
The team running the VM activity are approachable for interviews, experiences etc.

- ***Step 2*****:** Detailed description of the selected VM activities with an instrument based on Bijnens, Boussemaere, Rajagopal, Op de Beeck & Van Petegem (2006). This detailed description is created through literature analysis (based on available material) and interviews with the stakeholders (often teachers running the VM activity). They are then analysed by mapping the activity to the Competence Framework.
- ***Step 3*****:** Distillation of the design principles in each described VM activity, per competence in the Competence Framework.
- ***Step 4*****:** Grouping of all design principles implementing a particular competence, and formulation of a general design guideline.

4. Results:

Case description

The TalkTech project (http://talktechproject.net/) is a collaboration between Bentley University (Waltham, MA, USA) and University Politehnica of Timisoara (Romania). The project was initiated and organized by two individual professors (Mark Frydenberg and Diana Andone) responsible for the respective curricula at their universities. Both universities are located in areas that are technology hubs (university, industry), where the employment and the work situation are built around multinationals and international groups.
In the 10 years the programme is running, the TalkTech's objectives have remained to develop literacy skills through the simulation of a global work environment in which team members use web-based collaboration and communication tools to create digital content. Research questions that have guided the project since its inception are the following:

- How does participating in an international collaborative environment for learning change students' perspective over their subject of study (multimedia and internet technologies)?
- How will students use web-based synchronous and asynchronous technologies to collaborate with international peers to create a tangible work product in a short amount of time?
- What technical and cultural challenges will students identify in working globally, and how will they overcome them? (Frydenberg, 2018)

In the programme, American students are second year Bachelor students in Business studies. Their Romanian counterparts are 4th year Bachelor students in Telecommunications Engineering. The students (19-22 year olds) are paired to each other and assigned to projects on research about technology development on which they collaborate during an eight-week long period. Students select their partners at the beginning of the project. In principle, group composition is not changed after the students make their choice.
The students work together with collaborative multimedia tools,create a tangible artefact in the process of collaboration and write an essay together that is published online. Upon completion of the projects, students present the outcomes in joint presentations.
The programme uses a Project Based Learning Approach ("Introduce, Create, Synthesize, Apply, Work"). Students work in groups independently, with minimal support from the teachers, which pushes the students to do things by themselves and look for feedback from business (start-ups) on their own. The technology used, the general topics of interest and some milestones for planning purposes are given, but further planning and activities need to be filled in by the students themselves.
A common platform is used for communication and collaboration, however students are free to use other tools and communication channels to organize their collaboration. On average, they use 17 different tools over the whole project. Students decide themselves if they want to exchange private telephone numbers for easier communication.
Professors perform the assessment together: they both view the student projects and decide on the grades. The joint presentations count for about 35% of the final mark.
This virtual mobility activity has been evaluated in several ways: through usage data, interviews with the students and a ZEF evaluation (zef.fi). Evaluation from students has shown that the technology used is important: they need to be introduced early in the course, support collaborative activities and be easy-to-use. Students do note that the programme as a whole is time-consuming. Over the 10 years of its existence, the programme has been at the base of +/- 9 start-ups.

Mapping of the case to the Competence Framework

In the paragraph below, we look at the extent to which the OpenVM skills are developed in the TalkTech project. For each of the seven competences we determine to what extent skills and sub-skills are covered by the experience.

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 the own cultural identity, that the student enhances and demonstrates cultural understanding and can apply intercultural awareness in culturally challenging circumstances.

Table 1 Intercultural skills and attitude in Talktech project

Skill and sub-skills	***Explanations, elaboration and argumentation based on the case description and teaching practice***
Gaining cultural knowledge **- Gain knowledge about the culture they "visit"** **- Get to know other cultural-based perspectives of education**	- Knowledge of the culture of their partners in collaborative tasks is not an explicit requirement, nor the content of the project tasks. Yet communicating on a regular basis entails informal contacts and thus also learning each other's cultural habits and preferences. - Information on education, including culture-based perspectives is relevant for defining project outcomes and prerequisites, hence it is an explicit component of exchanges at least at some points of the project, f.e. while defining project goals, discussing the expected outcomes, etc.
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**	- Intensive collaboration on a joint project necessarily involves social contacts that lead to better understanding each other's cultural perspectives, i.e. the way authority is perceived, what agency means in different cultural contexts, relations in an organisation in f.e. multinationals. - It is part of the whole project experience in which the students collaborate during a longer period. Furthermore, the assessment by both teachers stimulates understanding of what learning is like in the country of the partner.
Enhancing own cultural identity **- Gain knowledge about own culture** **- Become self-aware of their own cultural identity**	- While one's own cultural identity does not form an explicit focus of joint collaboration, exchanges with peers during collaborative work include sharing personal experiences and personal standpoints, which increases awareness of one's own standpoints and identity and involves reflection on one's own cultural habits and preferences.
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**	- This is one of the goals of the project, which connects students from two different cultures making it possible for American students to experience how their Romanian peers act and reason and vice a versa. - Working in teams of two on one specific project-based task does not allow students to experience all the different facets of studying online. - In each duo-team two different backgrounds are represented, the groups are however too small to speak of a full or explicit 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**	- This is the core of the project in which duo-teams from two universities with different cultural backgrounds work on a realistic project task. - Working on a joint project pre-supposes knowledge exchange. Students may come from different walks of life and different cultural settings. - While dealing with intercultural issues is not the focus of the project, such issues may arise against the current political and social developments in both countries

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**	- Occurrence of culturally challenging circumstances cannot be avoided. Students do not get any instruction on how to act dealing with intercultural issues, however, interacting with their peers on a regular basis and getting to know each other, students learn to appreciate each other, they also learn when to express and when to withhold one's opinions.

Summing up, we can state that the TalkTech project offers many opportunities to develop intercultural skills and attitudes, although this is not the primary objective of the course design. The collaborative activities orchestrate situations in which learners can implicitly reflect on their intercultural experiences.

Networked learning

Developing networked learning implies that the learner engages in digital networking and deals with complexity in networked learning.

Table 2. Networked learning in TalkTech project

Skill and sub-skills	***Explanations, elaboration and argumentation based on the case description and teaching practice***
Engaging in digital networking **- 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**	- Students are working in duo-teams. Broader contacts and network forming are not supported in the project, nor do they form a clear focus. - Multinationals as possible future employers are part of the project setting and thus "are in the picture". Duo-teams make extensive use of ICT and various communication tools. - Digital competence and knowledge of English are essential in the collaboration.
Dealing with complexity in networked learning **- Cross boundaries in learning** **- Learn how to deal with complex situations** **- Learn how to deal with ambiguity**	- This project is conceptualised by the two professors as a crossing boundaries experience for the students, who are taken of their comfort zone and "thrown" into the deep water of independent project work with a person from a different culture. The professors do not design complex situations, however based on their experience and knowledge of the professional demands, they expect students to encounter challenging issues and resolve them in the process, thus engaging in complex learning and dealing with ambiguities

In sum, the TalkTech project supports networked learning in a limited way. Although the course design does not explicitly focus on viewing the learner groups as a network with all possibilities and complexities, these challenges do come to the fore as learners start their independent project work.

Active self-regulated learning

Being an active self-regulated learner implies that the student is able to self-regulate the own learning process, can reflect on the learning experience and one's own progress and can demonstrate that he/she has the agency of one's own learning.

Table 3 Active self-regulated learning in TalkTech project

Skill and sub-skills	***Explanations, elaboration and argumentation based on the case description and teaching practice***
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**	These skills and personal characteristics are demanded from professionals and needed to finalize the project work successfully. Based on the results, the program initiators (the two professors involved) confirm that students develop these personal skills, however the extent to which it happens differs per student.
Being able to self-reflect on learning experiences **- Be able to reflect on one's own learning process** **- Be communicative**	This personal skill is not explicitly a focus of attention. It is expected that participating students become better reflective learners after the VM experiences Communication plays a central role in the project and the skill that participants develop and demonstrate in the project
Demonstrating ownership over own learning (attitude) **- Being motivated to learn** **- Be constructive towards the course goal.** **- Have both digital and cultural competences**	These skills and attitudes for the background and the general frame of the project which students choose to take

In sum, TalkTech gives learners the opportunity to excel in their self-directed learning.

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".

Table 4 Media and digital literacy in TalkTech project

Skill and sub-skills	***Explanations, elaboration and argumentation based on the case description and teaching practice***
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**	The independent project work of the learners gives them opportunities to develop and show their learner control.

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**	The learners are made aware of the extent of possibilities of online distant collaboration, but also of its limitations. The students are expected to support their needs through all online means possible, including MOOCs, learning resources, etc.
Being proficient in assessing quality in courses and resources found online **- Proficiency in assessing course and OER quality**	The learners are not explicitly required to assess the quality of their Open resources, as their functionality is assessed against their purpose (namely, the value they bring to achieve the project goals).

Summing up, the TalkTech project supports the development of media and digital literacy skills to a great extent.

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.

Table 5 Autonomy-driven learning in TalkTech project

Skill and sub-skills	***Explanations, elaboration and argumentation based on the case description and teaching practice***
Demonstrating self-directedness in decision-making on own learning **- Develop learning self-regulation strategies - Develop persistence and creativity in organizing one's own study**	The learners are given a lot of freedom by the two instructors to determine their own strategies, planning, directions for their projects. In this way, they develop many autonomy-related learning skills.
Demonstrating independent learning **- 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**	Although the learners are autonomous in their learning, they are not explicitly required to include long-term thinking in their project. Contributions to the Open Education Environment in the form of tools, OERs and other resources is not actively promoted in the course design.

The independent learning projects of the learners in the TalkTech project give a lot of opportunity for autonomy-driven learning. A possible extension of the project would be a potential inclusion of an explicit requirement to contribute to the Open Education 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.

Table 6 Interactive and collaborative learning in an authentic international environment in TalkTech project

Skill and sub-skills	***Explanations, elaboration and argumentation based on the case description and teaching practice***
Enhanced team work skills **- Enhance team work skills**	Learners collaborate in international teams.
Collaborating with peers from different disciplines **- Exchange knowledge with peers from different disciplines** **- Interact and collaborate with peers from different disciplines**	The learners have a different background: the American students are second year Bachelor students in Business studies and their Romanian counterparts 4th year Bachelor students in Telecommunications Engineering.
Collaborating with peers within the context of an international learning experience **- Experience different learning methodologies** **- Have a learning experience different from learning offline and in own country** **- Collaborate in the open digital contexts**	The different learning contexts between the partner institutions is apparent for the learners, and an explicit part of the course design.
Interacting with authentic international resources in a foreign language **- Interact with libraries and databases, in other countries in a foreign language** **- Access to and use of authentic resources in a foreign language**	This aspect is relevant foremost for Romanian students, with their interactions in English.

The TalkTech project supports the development of interactive and collaborative skills in an authentic environment. However, it is clear that these skills may be developed in different ways in the two participating learner groups, due to the course design and context in which it is situated.

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.

Table 7 Open mindedness in TalkTech project

Skill and sub-skills	***Explanations, elaboration and argumentation based on the case description and teaching practice***
Being open-minded and tolerant **- Be open-minded** **- Be tolerant**	Open-mindedness is required in the interaction with peers, but this aspect is not explicitly designed for. It is expected that learners will have different opportunities to develop this skill, depending on the learner group they are in.
Demonstrating self-confidence in interaction with peers and teaching staff **- Be not afraid of interacting with peers or teachers at other institutions**	This is an explicit part of the course design.
Show willingness to improve proficiency in foreign languages **- Be proficient in foreign languages** **- Be willing to further improve proficiency in foreign languages**	This aspect is again primarily important for Romanian students.

Open-mindedness is developed within the TalkTech project, which provides opportunities to work on this attitude in both explicit and implicit ways.

5. Conclusions

The mapping results of the competences on the TalkTech VM activity shows the following:

1. **Intercultural skills & attitudes** are developed within this VM activity. Students are put in intercultural pairs, and are required to work collaboratively to come to a shared output.
2. **Networked learning** is minimally supported within this VM activity design. Although the students share a collaborative networked platform, there is no explicit focus on orchestrated networked learning. Incidental networked learning is possible.
3. **Active self-regulated learner skills** is developed to a good degree within the design. Students are given minimal support from the teachers, and required to self-regulate their learning to achieve their outcomes.
4. **Media and digital literacy skills** are highly supported as the students work and collaborate exclusively online with their distant project partners.
5. **Autonomy-driven learning** is supported to some extent within this VM design. Students are autonomous in their decisions within their project although some tools are given or chosen by the teachers.
6. **Interactive and collaborative learning in an authentic international environment** is highly present in this VM design.
7. **Open-mindedness** is a required attitude for this VM design. To achieve success, students need to be open-minded in their approach to collaboration with their partners.

VM design determines which skills are development and to what extent this development can progress.

6. Next steps

During 2019, more examples of VM activities will be described and added to the data collection. The instrument will be fine-tuned and applied. We aim to reach 15 good examples of VM activities that can be used to extract design principles for different competences.

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