



# Competence Needs of Modern Virtual Community Members

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**Purpose:** This paper examines necessary competencies in virtual communities in Higher Education. Therefore, we explore which competencies are needed to participate in a virtual community and how these competencies can be captured and developed.

**Study design/methodology/approach:** A systematic literature review (SLR) was conducted to achieve the research objectives.

**Findings:** As a result, five core competencies were identified: digital competencies, (inter)cultural competencies and language, social and communication competencies, self-motivation and self-management, and collaboration. Consequently, a self-assessment test for virtual community members was designed to capture existing competencies.

**Originality/value:** The Covid-19 pandemic as a driver of digitization has led to virtual collaboration being more prevalent than ever. This research paper contributes to the topic of virtual collaboration by informing about the necessary competencies and by developing an intuitive tool for self-assessing. Thus, preparing team members to become more successful in virtual teamwork.

## Introduction

At the beginning of the Covid-19 pandemic in 2020, a sudden change in the work and learning environment occurred (Lei & Medwell, 2021). As of new regulations and governmental restrictions, companies and universities were obliged to change their previously analog work and learning processes to a virtual environment. While meetings of work or learning groups were previously held mostly in person via face-to-face communication, virtual online communities inevitably formed during the pandemic. Thus, the Covid-19 pandemic is a major driver of digitization (Ricci, 2020).

Even though virtual collaboration offers new benefits, it also poses new challenges (Kirkman et al., 2002). In this context, the term global skills has also gained increasing importance in recent years (Bourn, 2018). The term refers to future competencies that are needed for education and the future world of business (Battelle for Kids, 2019). Therefore learners need to develop these skills to master future challenges (Ehlers, 2020).

Therefore, the following study examines the necessary competencies for community members of virtual communities in Higher Education (HE). Additionally, this paper offers a self-assessment test to determine individual competence levels for virtual collaboration. It also identifies initial approaches for closing potential gaps.

In summary, this paper addresses the following research questions:

1. What competencies do community members need to participate in a virtual collaboration in HE?
2. How can these competencies be captured?
3. How can these competencies be developed?

## **Theoretical Background**

### ***Competencies***

So far, despite numerous definitional approaches, there is no universally accepted definition for competencies in literature and education. Thus, competencies are often understood as a synonym for skills and abilities. The current research is based on the definition approach of Stoof et al. (2002), which summarizes a person's knowledge, skills and attitudes as competencies.

### ***Virtual Communities***

A virtual community is an online network “in which people with common interests, goals, or practices interact to share information and knowledge, and engage in social interactions” (Chiu et al., 2006, p. 1873). The interactions take place online and can therefore transcend geographical and political boundaries (Porter, 2004). Accordingly, a professional virtual community is based on three important components: members (people), social network, and knowledge (Chiu et al., 2011).

### ***Virtual Communities in Higher Education***

Referring to the definition of Chiu et al. (2006), corresponding communities can also be found in higher education. Virtual communities are online groups that enable students to communicate and share information about a common topic or purpose. An example of a virtual community in higher education is described by Safavi et al. (2019) with the Virtual Collaborative Learning (VCL) framework. Students collaborate in mixed teams of four to six participants in a self-organized way on a common project work (Balazs, 2005; Safavi et al., 2019).

## **Methodology**

So far, little research considers the relevant competencies of community members in the context of virtual collaboration in HE. Therefore, a systematic literature review (SLR) was conducted to obtain an overall view of the topic. The procedure of the SLR is based on the eight steps of Okoli and Schabram (2010).

Thus, the analysis of this research was conducted as follows:

1. *Purpose of the literature review:* This paper aims to provide a holistic overview of the necessary competencies of virtual community members. Based on the findings, a self-assessment test will be designed to identify competence levels and provide recommendations for improvement.
2. *Protocol and training:* Search strings are used in the context of a SLR. In this process, words or the lexeme of search words are linked by logical operators. Eight suitable search strings were developed in three iteration cycles (see “Appendix”). In addition, limiting parameters for the search were defined. The following parameters were used: Abstract; English; 2013-2022; “Only Content I have access to”. Table 1 shows the search strings used.

**Table 1: Search strings**

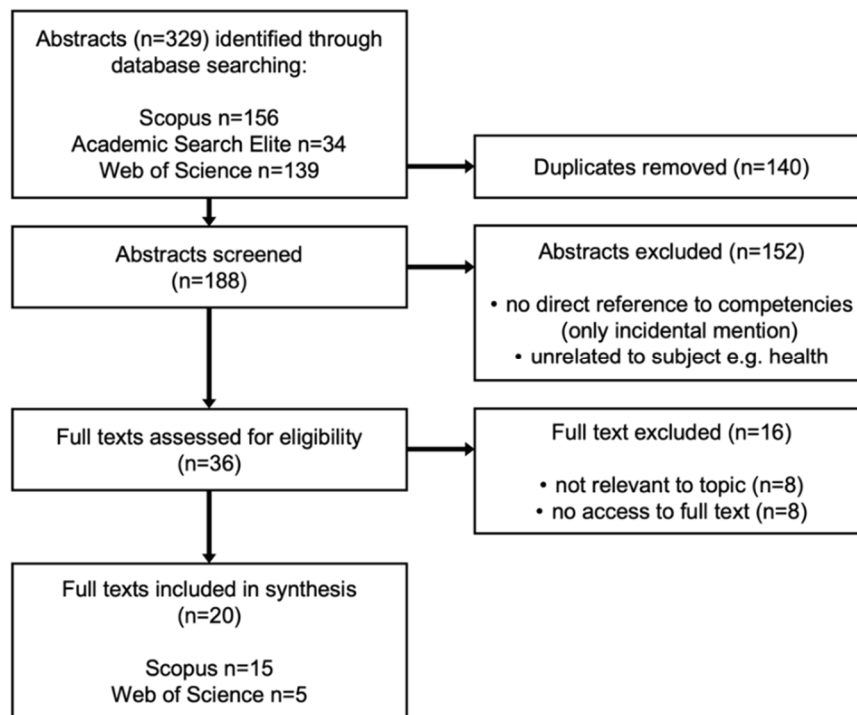
|    | Competence |     | Community            |     | Higher education   |
|----|------------|-----|----------------------|-----|--------------------|
| 1  | competenc* | AND | "virtual communit*"  | AND | "higher education" |
| 2  | competenc* | AND | "learning communit*" | AND | "higher education" |
| 3  | competenc* | AND | "online communit*"   | AND | "higher education" |
| 4  | skill*     | AND | "virtual communit*"  | AND | "higher education" |
| 5  | skill*     | AND | "learning communit*" | AND | "higher education" |
| 6  | skill*     | AND | "online communit*"   | AND | "higher education" |
| 7b | competenc* | AND | "online collab*"     | AND | "higher education" |
| 8b | skill*     | AND | "online collab*"     | AND | "higher education" |

3. *Searching the literature:* The three suitable subject databases Scopus, Academic Search Elite (via EBSCO Host) and Web of Science, were examined to obtain an overall view. These databases were selected because of their multidisciplinary and amount of available data. Initially, the database Emerald Insight Journal was to be used, but due to its mode of operation, it was not suitable for a valid comparison.
4. *Practical screen:* After the search, research contributions with low relevance to the topic were excluded. This included, e.g., search results from disciplines outside HE, such as politics or health care. Accordingly, the connection to university teaching was important for the narrowing down. It was also crucial that virtual collaboration emerged as the main topic from the corresponding abstracts.
5. *Quality appraisal:* In the abstract scanning, the abstracts of all search results were examined and qualitatively evaluated according to possible suitability. Three categories were established (s. "Appendix"): suitable (green), unsuitable (red) and not primarily suitable but with relevant input for research (yellow). Subsequently, the full-texts of the research articles were examined and re-evaluated. However, they were divided exclusively into suitable (green) and unsuitable for research (red). The deliberate selection of databases also ensures the quality of the identified research contributions.
6. *Data extraction:* After full-text scanning, all suitable research articles were summarized and subdivided according to a previously created template. This subdivision aimed to increase comparability while also making relevant findings and theories visible.
7. *Synthesis of studies:* The relevant findings and theories from the research were compiled and combined to answer the research questions. A total of five core competencies were identified.
8. *Writing the review:* This research paper, as a result of the SLR, provides an overview of the necessary competencies of virtual community members. The search strings used (Table 1) and the associated parameters ensure appropriate reproducibility.

## Results

Of the original 329 research articles identified, 140 duplicates were removed. Subsequently, the abstracts of the 188 remaining contributions were examined for relevance and suitability. Thus, 152 of these contributions were excluded due to a lack of relevance to answering the research questions. After abstract scanning, 36 research articles were suitable for full-text screening. Despite the previously selected limitation parameter "only content I have access to", eight articles were excluded due to missing access rights. In the full-text scanning, 20 of 28 research articles were classified as relevant for this research. The others, however, were excluded due to

a lack of relevance. Consequently, this paper builds on the findings of 20 research articles. Figure 1 shows the entire selection process.



**Figure 1: Selection process (Own representation based on Kolm et al., (2022))**

In a research by Kolm et al. (2022), which investigated a similar topic, six core competencies were identified. In contrast to these findings, based on the SLR, this research could identify the following five core competencies:

1. Digital competencies
2. (Inter)cultural competencies and language
3. Social competencies and communication
4. Self-motivation and -management
5. Collaboration

### ***Digital Competencies***

Suppose one would like to think that today's young generation, as digital natives, automatically possess high-level digital competencies. In that case, it must be said that Kolm et al. (2022) describe that there is a “[...] mismatch between this initial self-assessment and the actual availability of the necessary skills [...]” (p. 188). Erro-Garcés & Hernández Palaceto (2021) had a similar finding.

Therefore, it cannot be assumed that digital competencies are sufficiently present in the HE context. Kolm et al. (2022) describe digital competencies as the comfort of using Web 2.0 tools or Internet technology to communicate with international colleagues. The use of technology and the development of digital literacy are also mentioned, as well as the handling of synchronous and asynchronous tools (Kolm et al., 2022).

As information, data and identity theft, and privacy issues also occur in the online world, security literacy is also a part of digital competencies (Batrova et al., 2014; Özmen, 2013). Additionally, it is important for users to quickly adapt and adjust to new IT technologies (Turnbull et al., 2021). The willingness to use advanced techniques and technologies also belongs to digital competencies (Batrova et al., 2014). The ability to search for, find and utilize

information also forms a significant point (Batrova et al., 2014; Erro-Garcés & Hernández Palaceto, 2021; Jacobson et al., 2013; Ruelens et al., 2018).

Not only is information literacy vital in itself, but also developing critical thinking skills that help in critically reflecting on information gained (Jacobson et al., 2013; Moore, 2016; Riehle & Weiner, 2013).

### ***(Inter)cultural Competencies and Language***

In contrast to Kolm et al. (2022), this paper does not link communication and language but (inter)cultural competencies and language. This is because, in the literature, a frequent connection between social competencies such as self-confidence and high communication skills could be found. In contrast, intercultural competencies are characterized mainly by the ability to master (foreign) languages (Erro-Garcés & Hernández Palaceto, 2021). Language is defined here as a mere tool for communication and does not yet determine the quality of communication. Here, English appears to be essential. Students without an adequate level of English would have to resort to dictionaries, translators and videos to participate in the community (Erro-Garcés & Hernández Palaceto, 2021).

Moore (2016) sees the ability to cope with other cultures, time zones, and motivations as a critical future capability. Creating a culture based on trust, respect, and empowerment is essential (Moore, 2016).

### ***Social and Communication Competencies***

Parahakaran (2018) found that students without confidence prefer to communicate in group chat. A lack of affective skills, such as communication skills or willingness to cooperate, also have an impact on the success of a project (Parahakaran, 2018). This leads to the conclusion that social and communication competencies are closely linked. Erro-Garcés & Hernández Palaceto (2021) list interaction-communication-empathy as one of their top categories. According to Moore (2016), fostering empathy and facilitating communication are important features of social and communication skills. According to Özmen (2013), one of the barriers to communities is a lack of trust and an unsafe environment. One of the target competencies in a course conducted by students was the “willingness to use the basic methods and techniques of various types of oral and written communication on the main target language, including through the Internet” (Batrova et al., 2014, p. 5625).

In a study by Clauss & Fischer (2020), a large majority of students (95%) also state that a pleasant atmosphere and sympathy within a group are vital. The characteristics of a friendly environment are preventing conflicts, understanding among team members, and respectful cooperation. A high level of communication is also significant, understood as openness, quick reactions, an appropriate tone, organizational aspects, active participation of all participants, and the quality of responses (Clauss & Fischer, 2020).

In a study by Du et al. (2022), individual students describe online communication as less efficient because it was more challenging to observe other team members' reactions and address individual team members. This causes greater anxiety (Du et al., 2022). Thus, in online communication, attention must be paid to higher quality communication than in analog communication. Conflict management and emotional support are also part of the social skills category (Frانيا & Correia, 2022).

### ***Self-Motivation and Self-Management***

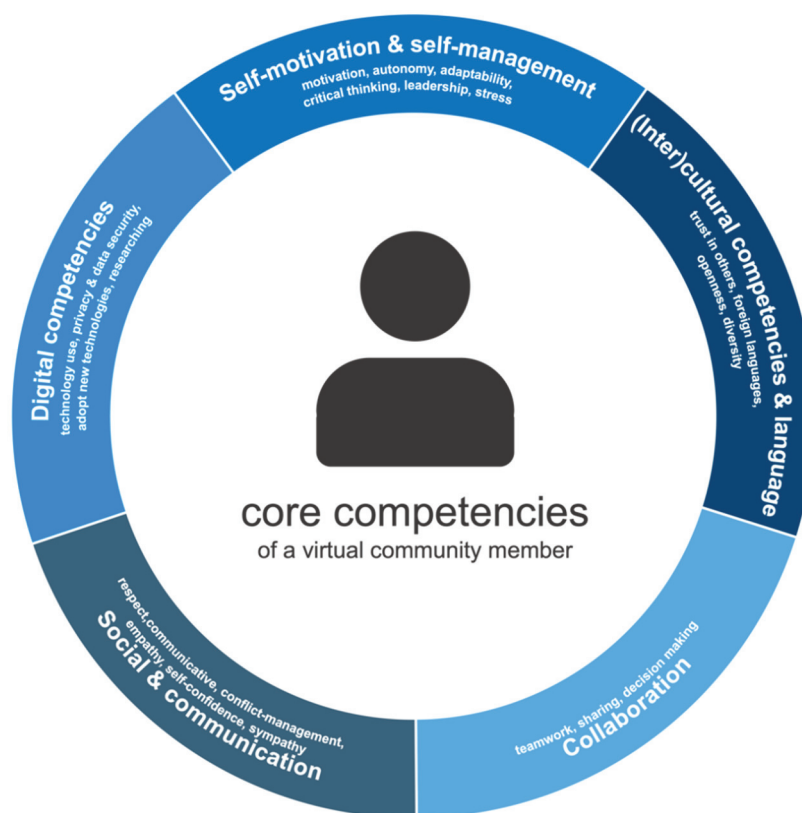
A study by Moore (2016) shows that members of virtual communities often do not use the tools of online collaboration software available to them. In this research, self-motivation and self-

management are therefore summarized as core competencies, as team members should be able to act on their own responsibility. Parahakaran (2018) sees self-motivation along with lifelong learning as essential. Autonomy, adaptability, and the development of critical and self-critical thinking also belong to this category (Moore, 2016). Özmen (2013) describes the lack of leadership as one of the barriers to a virtual community, which is defined via organizational inefficiencies and a lack of administrative skills, which in turn are interpreted as the lack of specific managerial knowledge and skills such as goal attainment and planning ability. Planning and implementation of a project are also mentioned as important competencies by Riehle & Weiner (2013). A paper examining students' cognitive load indicates that students suffer from more stress when working collaboratively than when working individually (Du et al., 2022). This also results in the competence of virtual teams to be able to regulate stress.

### ***Collaboration***

Collaboration is the ability to make consensual decisions (Hernández-Sellés, 2021) and the general ability to work together. Moore (2016) sees great importance for knowledge workers in creating their own fluid networks of collaborators. Decision-making is also seen as part of collaboration competence (Erro-Garcés & Hernández Palaceto, 2021; Hernández-Sellés, 2021), as well as the ability to distribute responsibilities properly (Hernández-Sellés, 2021). Ruelens et al. (2018) describe this as negotiations for authority. According to Du et al. (2022), good coordination is also needed. Kolm et al. (2022) mention “a strong sense of responsibility toward the team, treating different opinions equally, and being perceptive to hints and insinuations” (p. 192) as needed skills.

The results with the five core competencies are summarized in Figure 2.



**Figure 2: Core competencies (Source: Own representation)**

## Discussion

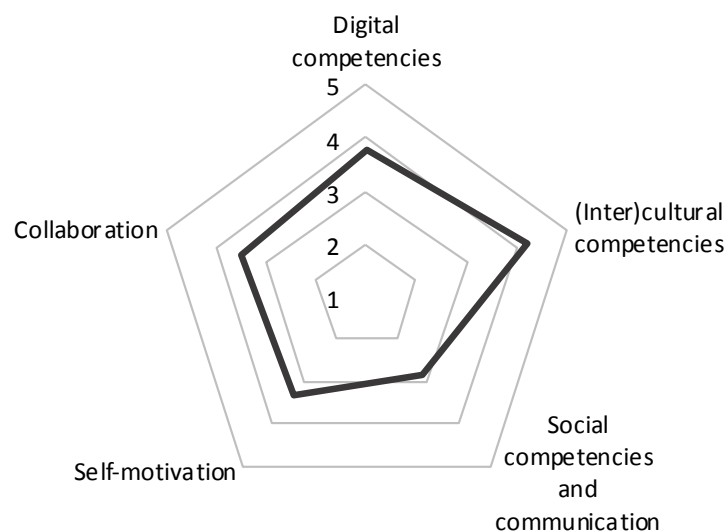
This paper describes the core competencies required for collaboration in virtual teams. Based on the results, it turns out that not one competence is decisive for team members, but a combination of the various competencies described. For example, strong social and communication skills are necessary for a good appearance in international communities. The most important thing here is to be empathetic, open, and linguistically competent. Collaboration skills are also inseparable from the others. Here, too, particularly good social and communication skills are essential. However, all these competencies are of little use without well-developed digital competencies. Here, it is interesting to note that self-attributed skills often differ from actual skills (Erro-Garcés & Hernández Palaceto, 2021; Kolm et al., 2022).

Therefore, a self-assessment test was developed to help members of virtual communities to identify their competencies and possible gaps.

The test was implemented, designed, and modeled using Microsoft Excel. Built on the results of the SLR, the test is divided into the five core competence fields. For each competence field, corresponding first-person statements were formulated, based on which the users are to evaluate themselves. A five-point Likert scale was chosen for the evaluation. The range was from “strongly disagree” to “strongly agree” with a “neutral” option in the middle. Thereby, the values can be interpreted metrically.

After the individual evaluation of the first-person statements, the users receive an assessment of their existing competencies. The study by Blayone et al. (2018) was used for the interpretation. In the study, it is assumed that if the mean value of a “category” is greater than or equal to three, it can generally be seen as mastered.

As part of the self-assessment test, the mean value is calculated for each skill area and then checked to see if it is greater than or equal to three. In the end, the user receives an overall result. This is made up of the five core competence fields. The competencies are displayed in a mesh diagram for a simplified visual representation, as shown in Figure 3.



**Figure 3: Mesh diagram self-assessment test (example) (Source: Own representation)**

Regarding the development of competencies, it can be stated that these are primarily developed in the practical implementation of projects in virtual spaces. Each participant already has a certain expression of these competencies due to his or her own personality, as they are formed automatically to a certain extent during life. It is therefore a matter of developing more or less already existing competencies.

As described in chapter 4.1, there is a discrepancy between the competencies attributed to oneself and those that really exist. To develop them, however, it is not enough to simply participate in projects. They must be assessed, observed, and actively encouraged by the participants and their tutors. To develop the missing competencies themselves, participants first must be aware of their lack of skills. This is also where the self-evaluation tool of this paper should provide support.

A good example of how competencies can be developed is given by Kauppi et al. (2020). There, a research project was conducted in two rounds. After the (rather negative) feedback of the first round, the second round was adapted so that students reported they had learned “competencies about how to collaborate remotely [...] using different tools for collaboration and learning different work practices” (p. 1110). All groups also reported that they had gained “competencies of collaboration and professional interaction” (p.1110). They also benefited collaboratively from their respective expertise (Kauppi et al., 2020).

Thus, the structure of a project and reflection play a major role in acquiring or enhancing competencies in the collaborative domain. Development specifically of information literacy, according to Riehle and Weiner (2013), requires “interaction between people and does not occur 'in a vacuum' away from community contexts [...]” (p. 131).

In a project by Erro-Garcés & Hernández Palaceto (2021), it was recognized that the students had mainly developed decision-making and cognitive development competencies. But also “communication, interactive, collaborative, motivational [...] skills are developed; empathy and adaptability are fostered, as well as the capacity to exchange ideas in a language other than their own. Altogether, it is important to generate activities that allow the student to develop competencies [...]” (Erro-Garcés & Hernández Palaceto, 2021, p. 13). Before and after the project, a test of DigComp was used to evaluate digital competencies.

The identified core competencies can be improved primarily through active participation in virtual projects. This must not be carried out blindly but must be actively improved through one's evaluation, reflection, and observation.

## Conclusion

This research addressed the competencies of virtual community members. The aim was to provide an overview of the necessary competencies and possibilities for recording and further developing them. For this purpose, 20 relevant research articles were found, compiled, and evaluated within a SLR framework.

As a result, related to the first research question, five core competencies were identified: digital competencies, (inter)cultural competencies and language, social and communication competencies, self-motivation and self-management, and collaboration. Furthermore, it was found that no single competence is decisive for the success of a virtual collaboration. Instead, the combination of several competencies is essential for a successful virtual collaboration.

A self-assessment test for virtual community members was developed to capture existing competencies and thus answer the second research question. Thereby, competence gaps can be identified. To further develop (existing) competencies and to answer the third research question, it is necessary to apply them in virtual teams, for example, and to reflect and observe oneself in the process.

Regarding the limitations of this research, it should be noted that the ongoing Covid-19 pandemic means that much more research on the topic is expected. This paper is based on a limited amount of existing literature. In addition, the results are grounded only on the three previously selected professional databases and English-language results. Expanding this



selection could certainly reveal more insights. It also should be mentioned that the self-assessment test is a preliminary prototype that needs further refinement before it can be applied in practice.

The Covid-19 pandemic as a driver of digitization has led to virtual collaboration being more prevalent than ever. Due to the high dynamics of necessary competencies, it is therefore crucial that future research examines new findings and results, and regularly reconsiders necessary competencies.

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## Appendix

The digital appendix of this research paper can be found at the following link:

<https://tud.link/zvge>

The appendix contains the following files:

1. Self-assessment test (competencies for virtual collaboration).xlsx
2. Search Strings (with derivation).xlsx
3. Hits (with evaluation).xlsx
4. Hits (with evaluation).xlsx