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THE UNIVERSITY-INDUSTRY COLLABORATION IN THE VIDEO-SUPPORTED LEARNING

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ABSTRACT

In the video-supported collaborative learning a joint pedagogical vision of educators and education technology companies could provide clear alignment for product development and usage benefiting various fields of knowledge-intensive work-life. A user-driven understanding about the process of learning and teaching via video-based collaborative teamwork can benefit the companies striving to meet the needs of customers in the emergent and changing digital environments. The collaboration between universities and the industry is increasingly perceived as a vehicle to enhance innovation through knowledge exchange. However, this collaboration is not without challenges. This study investigates the significant factors of university-industry collaboration in the context of video-supported collaborative learning. To answer the research question which factors are significant in initiating, maintaining, and developing video-supported collaborative learning practices in the university-industry collaboration qualitative research was conducted. The data included the observation of the workshops for education experts and teachers' and company representatives' interviews. The study suggests that collaboration is a process that needs, for example, common goal, commitment, the presence of the participants, dialogue, and the facilitation of social interaction including digital tools and forums to reflect and discuss the experiences. The university-industry collaboration at the organizational levels, as well as the individual level of participating managers, teachers, and students, is essential. Collaboration should not be considered as a static path; the collaboration needs to be continuously evaluated based on objectives formulated by the participants.



INTRODUCTION

Video-based e-learning and knowledge building are 21st century approaches; the modernization of European higher education institution (HEI) calls for a workable pedagogy and skilled teachers to take on the up-to-date video-supported collaboration solutions for creative teamwork in online environments. However, most teachers do not use video tools in a way that contributes to developing conceptual thinking and problem-solving skills as relevant work-life competence of the knowledge worker (Hobbs, 2006; Van Gog, Verveer, & Verveer, 2014). The same holds for pedagogical knowledge of designers in educational technology companies. This indicates that education and educational technology companies lack pedagogical models and structures to promote learning from and with videos (Krauskopf, Walshe, & Harvey, 2012; Krauskopf, Zahn, Hesse, & Pea, 2014).

Above also indicates the need for collaboration between HEIs and educational technology companies. The university–industry collaboration has existed for a long time, but activity increased significantly during the last decades. Universities are fulfilling their third mission of societal interaction by collaborating with private, public and third sector organizations. In addition, the ongoing changes in the business and operating environments require companies to innovate at a fast pace to deliver new products and services in order to meet the demands of users. The advantages of collaboration have been recognized in the previous literature, yet many organizations still find it difficult to initiate, maintain, and develop such collaboration (e.g., de Wit-de Vries, Dolfsma, van der Windt, & Gerkema, 2019; Rybníček & Königsgruber, 2019; OECD, 2019; Rantala, 2019). Hence, the aim of this study is to investigate which factors are significant in initiating, maintaining, and developing video-supported collaborative learning practices in the university–industry collaboration.

The empirical context in this qualitative study is from the research and development project called ViSuAL. The ViSuAL, Video-Supported Education Alliance, was a co-operation of six HEIs and six educational technology designers co-creating an evidence-based pedagogical model for video-supported collaborative learning. One of the aims of the project was to build university–industry collaboration model in the context of the video-supported collaborative learning. The data for this study is collected during the model building process.

THEORETICAL BACKGROUND

The HEIs are playing a key role in generating the knowledge, innovation and human capital required to increase European competitiveness in a knowledge-based economy. In order to tackle the challenges involved, universities require modern



approaches towards research and innovation. One of the strategies is the university-industry collaboration (Mora, Detmer, & Vieira, 2010; Rantala, 2019; Laitinen-Väänänen, Parjanen, Hyypiä, & Kүүsvek, 2020).

The university-industry collaboration has been accepted to generate advantages to participants, but it is not without challenges (Bruneel, D'Este & Salter, 2010). There are several barriers, for example, different organizational logics, structures, and goals for activities may hinder collaboration (Villaini, Rasmussen, & Grimaldi, 2017). Differences between different sectors can lead to separation, fragmentation, and disconnection, but also to learning, innovation, and cross-fertilisation if handled properly (see e.g., Kimble, Grenier, & Goglio-Primard, 2010; Parjanen, 2021; Kislov, Walshe, & Harvey, 2012). Because of that, the collaborative learning is needed during university-industry collaboration. Collaborative learning is thus an activity that takes place both in education, in working life and in between those. Collaborative learning is about seeing, for instance, how individual work connects with larger work communities. Connections in education or working life can be avenues for information, resources, and new ideas to be exchanged (Hyypiä, Parjanen, & Melkas, 2020).

University-industry collaboration could be described as an open innovation process. In the open innovation process, organizations use ideas and knowledge of external actors in their innovation activities (Laursen & Salter, 2006). The search for new product or service ideas and solutions to existing problems goes beyond the organization's boundaries (Chesbrough, 2003). For example, the technology users (teachers and students) could be active participants in the innovation process. It is important to make students' perceptions explicit and take them into account when designing teaching processes, in order to better observe and understand, for example, innovative uses of technology (Hyypiä, Parjanen, & Melkas, 2018). This kind of user-driven innovation processes are often interpretative - the goal is to discover new meanings via interaction and continuous dialogue among people and organizations with different perspectives and backgrounds. The process is ongoing and open-ended. (Lester & Piore, 2004.)

Griffiths and Guile (2003) described four models for co-operation between HEIs and companies. In the most advanced co-operation models, knowledge and skills are resituated, which means reviewing current activities from a new perspective and discussing new ways of acting together. When co-operation continues and develops in a more advanced direction, trust between partners increases and mutual aims can be defined, and the co-operation can then be labelled a partnership. A partnership aims to offer new solutions to new problems, which no organization can overcome alone. (Häggman-Laitila & Rekola, 2011.) Stähle and Laento (2000) call collaboration in its best, as strategic partnership. The partners of strategic partnership are seen to set common aims and goals. Strategic partnership is based on



commitment, and it is seen usually as a long-lasting relationship. (Laitinen-Väänänen & Vanhanen-Nuutinen, 2013.)

METHODOLOGY

The empirical context of the study

The empirical context comes from the project called Video-Supported Education Alliance (ViSuAL). ViSuAL was a co-operation of six HEIs and six educational technology designers co-creating an evidence-based pedagogical model for video-supported collaborative learning (Table 1). In the long run, ViSuAL will contribute to meeting the modernization needs of European HEIs in advancing digital skills for learning and teaching. Due to the practical nature and provision of workable practices for transforming education, the teacher will embrace the experimentations carried out in ViSuAL in local level and spread it through their institutes. The insights gathered during the co-creation process have an impact on the innovation capacity of the companies in partnership with their stakeholders, customers and the HEIs as the researchers, facilitators, and design partners of the companies. (More about the project and the participants see e.g., <https://visualproject.eu/>).

Table 1. ViSuAL project partners and aims.

Project partners		Aims and objectives
Higher education institutions	Educational technology companies	
Aeres University of Applied Sciences Wageningen, The Netherlands JAMK University of Applied Sciences, Finland University of Tartu, Estonia LUT University, Finland Universidade de Evora, Portugal Swiss Federal Institute for	Iris Connect Ltd, United Kingdom Flowbox Ltd, Finland DiSEL21 Oy, Finland Bloco Gráfico, S.A, Portugal Nordic Simulators Ltd, Finland	<ul style="list-style-type: none"> • To develop, test and validate pedagogical models and practices for video-supported collaborative learning. • To integrate the created pedagogical model and practices into the teacher education and professionalization to capacitate future HEI teachers. • To create, test and validate concepts for experimentation based pedagogical co-creation in partnership of education technology designers, pedagogical researchers, teachers, and their students.



Vocational Education and Training, Switzerland		<ul style="list-style-type: none"> • To provide scientific evidence on the effect of video-based communication tools on the professionalization of teacher trainees to support the validation of the pedagogical models. • To provide an assessment tool for evaluating the impact of video-supported collaborative learning on professional development.
Associated partner: EAPRIL European Association for Practitioner Research on Improving Learning		

The data collection during the model building process

One of the aims in the ViSuAL project was to build a collaboration model between HEIs and education technology companies. The data for this study is collected during this model building process including the observation of two workshops, teachers' and education technology company representatives' interviews and written comments received both from companies and higher education actors during the model building process.

The concrete kick-off for the ViSuAL project group for visualizing the model was organized in November 2019 in Tartu during the project meeting. The aim of the co-creation workshop was to hear each project partner's voice and support their co-creation process and to activate them to reflect on their previous experiences and experience during the ViSuAL project. As a result of this workshop, the first version of the model's visualization was produced.

After the Tartu meeting, a group of project participants (including the authors of this article) took the leading role in preparing the model. The small group collaborated and met online several times during the model building process. The group prepared interviews for six video-technology providers. The purpose of the interviews was to define the factors of the successful collaboration between education technology companies and HEIs from the company's perspective. In addition, 25 higher education teachers' interviews about the experiences of using videos in teaching were conducted. Interviews were transcribed and analyzed by applying thematic content analysis (Tuomi & Sarajärvi, 2003). These preliminary findings from the interviews were used to instruct and orientate participants of the second co-creation workshops.

The second co-creation workshop was organized online in May 2020. The workshop aimed to hear all the project partners' opinions and comments on the visualized



version of the model and create and produce ideas for revisions and amendments collectively. Eighteen participants joined the online workshop, one from each company and one or more from each HEI. At the beginning of the workshop the main outcomes from the teachers' interviews and company interviews were presented to give the participants an overview and orientate them to the present situation.

Next, the leading group work really started. They met online, discussed, and reflected together several times. They read again through the interview data and started more deeply to analyze and interpret it. In addition, notes and comments from both workshops were reflected together in terms of finding the basic factors that would describe the preconditions for the collaboration. As a result, the model of university-industry collaboration was generated (Figure 1).

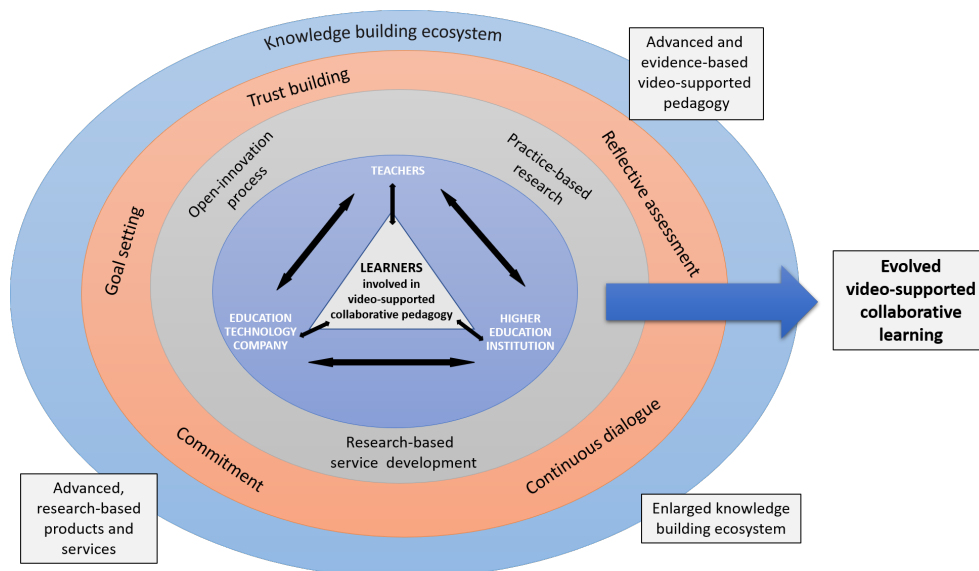


Figure 1. The university-industry collaboration model in the context of video-supported learning (see also Laitinen-Väänänen et al., 2020).

RESULTS

This study investigates which factors are significant in initiating, maintaining, and developing video-supported collaborative learning practices in the university-industry collaboration. In the model (Figure 1), especially the factors mentioned in



the red circle *trust building, commitment, continuous dialogue, goal setting, and reflective assessment* are considered important in the university-industry collaboration. The knowledge building ecosystem refers to the understanding that the collaboration between partners builds each partner's knowledge and the networks have similarities with the ecosystem way of working. The collaboration could also be described with the concept of an open innovation process, a research-based service development and practice-based research. These are crucial in opening the possibility for both HEIs and companies to receive added value from the collaboration.

According to the results of this study, the collaboration process is an iterative process, which asks for time, trust, and open communication. Establishing a partnership is both an essential and time-consuming issue in university-industry collaboration. At the beginning of the collaboration, the participants do not necessarily know each other and their expertise and there is need to learn from each other in order to be able to jointly develop the innovation. The absence of social proximity may cause challenges in collaboration, which may be seen as lack of commitment to participate or even withdrawing from collaboration in the middle of the process. This also raises the question of how to motivate the participants to take part in the ongoing collaboration and this should be taken into account in the planning stage of the collaboration. An ideal situation is where all participants perceive the benefit from the collaboration. In addition, it should be noticed that the benefits are different; the companies seek business opportunities and user knowledge to enhance their products and services, and the universities are interested in pedagogical and learning benefits.

What is important is to be able to have dialogue and reflect during the collaboration. Innovation is always also a communication process. Communication, particularly when taking place across professional boundaries, needs particular care. Innovation emerges as a kind of synthesis of several points of view. This leads often to the problem of how to fit together different perspectives, in this case educational and business perspectives. Different perspectives can cause misunderstandings between partners. For example, those sending communications may be clear about the message they are transferring, but the receiver interprets the information differently. The receivers will understand the message from their perspective. These kinds of interpretive or communicative barriers can hinder collaboration. Collaboration can only emerge if all participants take part in the process of communication and interpretation. Related to the data (Table 2), the communication was considered essential and the need for communication channels of different kind including also face-to-face communication. Face-to-face communication enhances trust between partners and resolves possible conflicts.

In the beginning it is important to communicate and truly listen to each other trying to find shared language and joint understanding. This needs for verbalizing and sharing the expectations from both sides. Without a common language and concepts,



it is difficult to engage in a combination and exchange of knowledge. To the extent that participants' concepts are different, they keep participants apart and restrict their ability to gain access to other and their information. In this kind of situation, there is a risk for misunderstandings. According to the data (Table 2), this was seen clearly between teachers and IT experts. The teachers did not have the needed knowledge to use video technology and the IT experts' language use and concepts were not always understandable.

If both partners are not equally involved in the setting of the goals, there is a risk that the goals remain unclear. If partners have common goals, they have to reflect on the ways to reach it. The continuity is seen important in the partnership. To show the impact, the indicators need to be agreed together. In university-industry collaboration, it is very important to consider both the duration of the project and the mobility or changes of the persons involved in the project. Particularly, from the perspective of start-up companies three years can be quite long time to reap the desired benefits from the project. Moreover, from the perspective of personnel change, joining a project during the last year of the development process can be quite onerous for both parties. Naturally, people who leave in the middle of collaboration, for example, by changing their jobs, take them meaningful skills and knowledge that has already been achieved.

The collaboration process should not be considered as a static path; the process needs to be continuously evaluated based on objectives formulated by the partners and other stakeholders. According to the data (Table 2), reflective assessment was considered as an important way to evaluate the collaboration process. The reflective assessment is a process through which partners can experience assessment as a part of the collaboration, rather than as a separate evaluation.

Table 2. Overview of significant factors in the university-industry collaboration.

The university-industry collaboration model factors	Referenced quotations from the data
Knowledge building ecosystem	<p>“In the future, technology plays a major role in education, but even more important is the substance of education; how and by what means, and how effectively in a pedagogical sense, the teaching and learning situations can be offered.”</p> <p>“...Higher education institutions are seen as an important customer for companies, but difficult to reach.”</p>



	<p>“We [the whole ViSuAL project/ collaboration] have the opportunity to create something that would add something new to the overall teaching practice – which would hopefully really lead to much wider implementation. And therefore, a much stronger impact on teaching and learning which we ... believe in.”</p>
<p>Trust building Reflective assessment Continuous dialogue Commitment Goal setting</p>	<p>“... trust has been built all over the project, all over the meetings, all over the interactions...”</p> <p>“... I would like us to ensure that the concepts and language we speak are also open to our target audience without interpretation.”</p> <p>“... sit down to discuss what sort of goals the project should have and preferably, have the goals as realistic and concrete as possible”.</p> <p>“One of the richnesses of this project is the fact that we are evaluating the experience before and after we are capturing [it].”</p>
<p>Open-innovation process Practice-based research Research-based service development</p>	<p>“...which means that there has been some perspective-taking, perspective-bringing or even perspective-sharing, we could say, and I mean coming from two different worlds, two different cultures.”</p> <p>“The goal of the company is naturally to gain such knowledge of their own product or service during the project...”</p> <p>“When management and IT are committed and support the educational staff, everything looks much brighter in terms of collaboration.”</p> <p>“...then we end up having just maybe a few practitioners within the institution who are obviously – if we think about the adoption curve of different kinds of innovators – early adopters, risk-takers who are willing to try something new, but when it comes to the actual proper</p>



	<p>integration within the whole team and structure, facilitation is lacking.”</p> <p>“It was important since we’ve ended up collaborating a lot between us and it was fruitful sharing ideas and knowledge.”</p>
<p>Teachers</p> <p>Higher education institutions</p> <p>Education technology company</p>	<p>“This is teamwork. It has to be the technology provider along with teachers and the university. For me, the university helped a lot by making the bridge between teachers and the technology provider.”</p> <p>”...now I feel that if I had been the only teacher here without my colleagues, I would have been really lonely.”</p> <p>“The biggest problems tend to lie in the relation between the HEI’s IT department and the educators, that is, the people who do the most important educating work. The teaching staff may say that they need a specific tool or software, but the IT people may say that it is not possible...”</p> <p>“The biggest challenges are related to the hardware and software: ‘to facilitate the proper and functional use of the technologies in a worthwhile and functional manner’”.</p>
<p>Learners</p> <p>involved in video-supported collaborative pedagogy</p>	<p>“The university’s technical services were a fundamental support for the development of the project, as they promoted activities with students with technological means that we did not have in the classroom and introduced the students to new ways of working in groups, presenting them with a set of new tools.”</p> <p>“The company should build a closer dynamic with the users. It could be a simple online chat. In this situation, which is an experiment, with a product that might have different flaws and needs constant feedback from the developers ...”</p>



	“Students reacted positively to using videos in their teacher training and felt that there was increased support at the workplace while using the [company’s] solution...”
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CONCLUSION

The university-industry collaboration generates advantages like in this study advanced, research-based products and services, advanced, evidence-based video-supported pedagogy, enlarged knowledge building ecosystem and evolved video-supported collaborative learning. However, the collaboration should be handled properly. At the organizational level of relevant institutions as well as the individual level of participating managers, teachers, and learners are indispensable. The premise for a successful collaboration is a commitment and clear view of all partners what they wish to accomplish. Common goals and means must be clear when the collaboration set in motion. Collaboration helps create networks on the basis of the collaboration and they in turn enable further exploitation at a later stage. In addition, the prevailing cultural differences between university and industry, if we acknowledge and accept them, they may be an enriching experience.

Due to the Covid-19 crisis, digital and distance learning has taken a huge leap. Digital learning practices ask for platforms and tools to promote studying and interaction taking place during the learning process. HEIs in needing those tools will collaborate with companies providing such utilities. From the company perspective, in further developing their products, companies need HEI’s management commitment and IT’s understanding, users’ feedback and in that teachers and students are an important source. In order to achieve the goals of both, cooperation and close interaction together with research are needed, so that what is learned can be shared and transferred to other environments.

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