

This is a self-archived version of an original article. This version may differ from the original in pagination and typographic details.

Author(s): Tynjälä, Päivi; Virtanen, Anne; Virolainen, Maarit H.; Heikkinen, Hannu L.T.

Title: Learning at the interface of higher education and work : Experiences of students, teachers and workplace partners

Year: 2022

Version: Accepted version (Final draft)

Copyright: © 2022 Taylor & Francis

Rights: In Copyright

Rights url: <http://rightsstatements.org/page/InC/1.0/?language=en>

Please cite the original version:

Tynjälä, P., Virtanen, A., Virolainen, M. H., & Heikkinen, H. L. (2022). Learning at the interface of higher education and work : Experiences of students, teachers and workplace partners. In E. Kyndt, S. Beusaert, & I. Zitter (Eds.), *Developing Connectivity between Education and Work : Principles and Practices* (pp. 76-96). Routledge. <https://doi.org/10.4324/9781003091219-7>

Learning at the Interface of Higher Education and Work: Experiences of Students, Teachers and Workplace partners

Päivi Tynjälä, Anne Virtanen, Maarit Virolainen, & Hannu L. T. Heikkinen

1 Introduction

Interest in developing a pedagogic approach in higher education to meet the needs and expectations of the world of work has increased during the last decades for several reasons. On the societal level, concerns about the professional relevance of higher education programmes have become persistent. The employability of higher education (HE) graduates has become a more topical issue since the adoption of the Bologna process and the shift toward the so-called post-massification era of higher education (Schomburg & Teichler, 2011; Teichler, 2013; Puhakka, Rautopuro, Tuominen, & Vuorinen-Lampila, 2012). In many Western countries, graduate employment has become a performance indicator that has an effect on institutions' public funding. Adopting learning through work experience as part of one's studies is seen as a promising way to smoothen graduates' transition to working life (Billett, 2015; Tynjälä & Newton, 2014).

On the one hand, periods of learning from work experience are expected to facilitate students' learning and competence development by providing them opportunities for boundary crossing (Bakker & Akkerman, 2019). On the other hand, the partnerships and collaborative relations between higher education institutions (HEIs) and workplaces serve multiple functions. From the perspective of higher education, co-planning and co-organisation of curricula and studies, student mobility and the provision of adult education are central in this collaboration. However, from the perspective of research and innovation, particularly important for enterprises are also collaborative projects, mobility and entrepreneurship of personnel, funding, and enterprises' representation on the governing boards of HEIs (e.g., Davey et al., 2018).

Already in the 1990s, Florida (1995) anticipated learning regions that aim to enhance innovative networks between enterprises and HEIs, characterised by networking, global infrastructures and communication, organisation of production in a networked manner, codependency, and loose regulation. Such collaborative relations enable reciprocal knowledge transfer also informally. More recently, there has been an increased interest in utilising digital ecosystems of learning as

part of the co-operative constellations between HEIs and workplaces. These learning regions can also be conceptualised as *learning ecosystems* that intertwine higher education and the working world of a region, emerging at the interface of business, universities and schools (Barnett & Jackson, 2019; Godfrey & Brown, 2019). These ecosystems can also be analysed by applying ecological principles (Capra, 2005), characterising collaborative relations between networking bodies (e.g., Kemmis & Heikkinen, 2012).

Overall, the collaborative relations between HEIs, enterprises, and public sector organisations can be thought to benefit the building and enhancing of an ecosystem for knowledge exchange, development and innovation in general, even though the planning and organisation of student learning addresses a more specific goal. Altogether, the framework where curricular planning and provision takes place is dependent on the overall ecosystem between the world of work and HEIs.

Generally, most studies concerning outcomes of learning from work experience organised as part of HE bring up positive outcomes, even though the results have not been univocal as different studies are based on different societal and organisational settings (Brooks & Youngson, 2016; Jackson & Collins, 2018; Silva et al., 2018; Irwin, Nordmann, & Simms, 2019). For example, study results based on comparisons between students participating and those not participating in work placements as part of their degree studies in the UK showed positive outcomes for the participants of work placements. In comparison to the non-participants, students who participated in work placements showed improved academic performance in the last year of their studies and more of them gained a relevant job with a higher salary upon starting their occupational career (Brooks & Youngson, 2016). Meanwhile, according to study results from Australia, the positive influence of work-integrated learning during the final year of higher education was seen to be reflected in the somewhat better quality of employment gained by those graduates, particularly in terms of higher levels of relevant employment (Jackson & Collins, 2018). A Portuguese study reported relatively strong indications that study programmes that included internships enhanced graduate employment significantly (Silva et al., 2018). However, the findings by Silva and colleagues (2018) also pointed out that the way in which internship experiences were organised along study programmes was meaningful for the outcomes. A Scottish study based on the analysis of qualitative data highlighted that the “relevancy of both experience and degree topic was important for employability, along with students’ interpersonal and professional skills” (Irwin, Nordmann, & Simms, 2019, p. 761). Furthermore, the results of a

large longitudinal study showed internships to have positive effects on academic outcomes (Binder, Baguley, Crook, & Miller, 2015). Somewhat in contrast to these previous study findings are the results from studies conducted in South Africa, which have brought up that excessive internship workloads and inadequate supervision have prevented the optimal development of professional competencies (Naidoo, Wyk, & Adhikari, 2017; Ross, Naidoo, & Dlamini, 2018).

While the majority of studies concerning work-integrated learning have focused on internships or practicums, there are less studies on practices that involve students working on commissioned assignments or projects from companies or public sector organisations, but where working takes place mainly at the university or school. In these work-related projects, students regularly visit the client company, negotiate the goals and procedures, and follow the progress of work together with the client. Typically, they also have a mentor or supervisor from the workplace and a teacher who guides students (e.g., Helle et al., 2006; Tynjälä et al., 2009). In studies on such work-related learning, students have reported about the development of their generic working life skills (Beier et al., 2019; Tynjälä et al., 2009) and increase of intrinsic motivation for their studies (Helle et al., 2006).

Altogether, HE students' work-related learning or learning at work during their studies has been seen as a way to enhance their competencies and transition to working life as graduates. Present day HE graduates are expected to work around 35–45 years during their life and therefore their ability to plan their own learning and utilise both formal, informal and non-formal learning opportunities to keep up with the pace of change is crucial. Due to a shift toward the next industrial age, called also the Fourth Industrial Revolution or Manufacturing 4.0, many job profiles are expected to change or even become outdated. The often mentioned megatrends of this age include digitalisation, robotisation, globalisation, and the necessary measures to combat climate change, and these are expected to continue to transform working practices as well as the ways of living all over the world. For these reasons, many young graduates may have to learn new hybrid combinations of professions or change career at some point in their professional life (Nedelkoska & Quintini, 2018).

In recent research, connectivity between education and workplaces is often seen as a central element in preparing students for the requirements of the future labour market (e.g., Guile & Griffiths, 2001; Billett, 2015; Sappa et al., 2014, 2016; Tynjälä et al., 2020). In accordance with the focus of this book, designing connectivity between education and work, this chapter will

present findings from a study that focused on strengthening the connectivity between Finnish higher education institutions and workplaces. In this study, our data covered both learning at the workplace and work-related assignments carried out in collaboration with the workplace and higher education institutions. Before describing the findings of the study, we first introduce the theoretical and analytical framework of our study in the following section.

2 3-P Model of Student Learning at the Workplace as analytical framework

In the next part of this chapter, we present an empirical study on students', teachers' and workplace partners' experiences of learning at the interface between HE and work. As an analytic framework, we used a revised 3-P Model of Workplace Learning (Tynjälä, 2013; see also Gruber & Harteis, 2018, pp. 158–168; Marsick, Watkins, & O'Connor, 2011, pp. 200–202;), which is based on the overall model of learning presented by Biggs (1999). The 3-P Model of Workplace Learning (Tynjälä, 2013) mainly describes the learning of employees in their work, whereas, in our present study, the learners were students. For this reason, we modified some elements of the model. The modified version, now renamed *3-P Model of Student Learning at the Workplace*, is presented in Figure 1.

INSERT FIGURE 1 ABOUT HERE.

Figure 1. The 3-P Model of Student Learning at the Workplace (modified from Tynjälä, 2013)

The three P's of the model refer to the main components of student learning at the workplace: *Presage* factors, *Process* factors, and *Product* factors. The Presage factors include learner-related factors, such as prior knowledge and experience, agency, motivation, and life situations, as well as factors related to the learning contexts, that is, the workplace and the education institution. In Figure 1, the latter is extended to the “interface of the education institution and workplace” because, for student learning, a significant factor is not only the school itself but rather how the school and workplace are connected and how learning in both contexts is integrated with each other (Virtanen, Tynjälä, & Eteläpelto, 2014). First of all, the factors related to the workplace include the affordances of the workplace (Billett, 2002), that is, the possibilities that it provides for the members of the work community and students. The affordances include organisational characteristics, such as, the approach to supporting learning (expansive versus restrictive, Fuller

& Unwin, 2004), encouraging active membership, organisation of work, collaborative climate, and managerial support.

The Process component is composed of factors identified as central to workplace learning processes, such as reflection, collaboration, participation, deliberate practice, and problem solving. In addition, in the context of connecting school learning and workplace learning, integrative thinking is important for linking theoretical and practical knowledge.

The Product factors include the outcomes of learning, which in the workplace context may be, for example, better task performance, deeper understanding, improved skills, strengthening agency and identity, and, especially in cases of development projects, even organisational development or improved productivity.

In Figure 1, there are arrows showing that the Process factors are influenced by the Presage factors, yet that the influence is not direct, but usually mediated by the interpretation of the individual learner. The arrows also point out that the nature of learning processes (i.e., Process factors) has an influence on the learning outcomes (the Product), and that feedback flows from Process and Product to Presage factors. For example, teachers, workplace trainers or students themselves may make changes to learning environments based on students' approaches to learning. Similarly, when a successful learning process has led to the strengthened agency of a learner, then, in the next learning process, further improvement can be expected in the learner's agency, commitment, motivation and self-confidence. As the visual presentation may lead to the idea that the components of the model are sequential, it is important to note, as Gruber and Harteis (2018, p. 161) have, that the components of the model should be seen as simultaneous elements. Also, the relations between the components are reciprocal (as the arrows show) rather than unidirectional, and the components comprise both individual and social aspects of learning.

The 3-P Model of Workplace Learning emphasises the context of learning, referred to as the sociocultural environment, including the social environment and artefacts of human culture, including technologies and organisations. Research has produced several concepts referring to different characteristics of the sociocultural context of workplace learning, such as those of organisational learning (Argyris & Schön, 1978, 1996), communities of practice (Wenger, 1998), and activity systems (Engeström, 1987, 2011).

In our empirical study, we used the 3-P Model of Student Learning at the Workplace as an analytic framework for organising our findings. In the next section, we describe the aims and methods of our study.

3 Aim of the study, data and methods

The purpose of our study was to examine the practices of connecting work and learning in Finnish universities of applied sciences from the viewpoints of all partners, that is, students, teachers, and workplace representatives. While following the 3-P model (Figure 1), we focused on the three main elements of learning: Presage, Process and Product factors. More specifically, the following research questions were addressed:

- 1) *Presage factors*: How do students, teachers and workplace partners describe the role of the Presage factors of student learning in work-related study modules?
- 2) *Process factors*: a) How do students describe their learning processes during the work-related study modules? and b) How do teachers and workplace partners describe their own role in student learning processes?
- 3) *Product factors*: How do students, teachers, and workplace partners describe the products of work-related study modules?

The data were collected as part of two large-scale developmental projects funded by the Finnish Ministry of Education, concerning the relationship between higher education and work (*eAMK—Choose, Learn, Specialise*; Koskinen, Nakamura, Yli-Knuutila & Tyrväinen, 2020; and *Toteemi—Learning from Work for Work*; Kotila & Vanhanen-Nuutinen, 2019). Among other things, these concerted multi-partner projects aimed at supporting students' learning and engagement in the labour market by researching and developing different practical models to combine higher education studies and work. In order to study their models for connecting work and learning, we invited all the participating universities of applied sciences (UASes, n=23, N=24) to offer good examples of their work-related practices as research subjects (The 13 academic universities were excluded because they were not involved in the two above mentioned development projects). Altogether, 11 different work-related study modules were chosen from different occupational fields across Finland. The following selection criteria were applied: the sample had to include different study fields, it had to include UASes from different regions of

Finland, and it had to include collaboration both with public and private sector organizations. The research subjects were derived from the fields of health and welfare, engineering, manufacturing and construction, and information and communication technology; two of the examined study modules were multidisciplinary, with students from different fields collaborating during the study modules. In addition, all of the examined study modules represented the practices where students carried out commissioned assignments or projects from companies or public sector organisations, but where the work mainly takes place at the UASes. The assignments or projects required collaborative working in student groups, and between students, teachers, and workplace partners. The extent, duration, and levels of the modules varied. The data were collected by interviewing 88 students, 35 teachers, and 17 representatives from workplaces. Most of the interviews were carried out in groups, but some individual interviews were also conducted. All of the teachers of these work-related study modules were included in the data, but only a subset of the students from each study module took part in the interviews. The interviewed workplace representatives were those whom teachers considered to be important partners. Interview participation was voluntary.

The data were analysed using theory-led thematic content analysis (Elo & Kyngäs, 2008; King, Horrocks, & Brooks, 2019), and the modified 3-P Model of Workplace Learning (Tynjälä, 2013) was used as the analytic framework (Figure 1). The interview transcripts were analysed in relation to the *presage* factors (individual and contextual) of workplace learning, *processes* of workplace learning, and *products* of workplace learning. In addition to this theory-led analysis, a data-driven approach was applied to identify those specific characteristics within the presage, process and product factors that were not necessarily explicitly outlined in the 3-P model.

4 Findings

In the following sections, we report the research findings regarding the UASes' work-related study modules from the perspectives of the students, teachers and workplace partners. Following the logic of the 3-P Model of Students' Workplace Learning (Figure 1), the findings related to presage factors are presented first, after which those pertaining to learning processes and products follow.

Presage factors of students' learning in the work-related study modules

Students

In their interviews, students especially emphasised the significant role of following two types of presage factors of work-related study modules: (1) their age and/or study year, and (2) their work experience and earlier studies. The interviewed students were at different stages in their studies, and students at early stages, in particular, felt that getting used to collaborative learning demanded quite a lot of effort from them. Although the students felt that working with other students was a useful and productive form of learning and teaching, it was a totally novel form of studying for them and therefore seemed to require practice. A young student reflected on the experience as a rewarding challenge:

“At first it [working collaboratively with other students] felt pretty hard. Still, it was really nice being in the group, which gave us a lot of confidence to do things. But, considering that it started in the first year, there was such tight teamwork in my own project group.”

Many students had earlier work experience and some of them also had former qualifications; these students felt that both of these experiences fostered their current studies. Both the work experience and earlier studies enabled the students to develop a broader perspective of their studies. This facilitated their focus on the essential things, and helped them see new things in relation to their prior knowledge. In the following quotation, a student brings up this kind of reflective thinking between theory and practice:

“And, somehow, having that [earlier] workplace made it easier to understand some things, since it was possible to ponder them through my own workplace and work experience.”

In general, the students' discourses concerning the contexts of their learning (i.e., workplaces and UASes) were very positive. For example, they discussed workplaces in a favourable tone; they described that the workplace partners were satisfied with their activities at the workplaces. They also felt that the workplace partners were committed to guiding them. (The UASes had either formal or informal agreements with workplaces about their role of the workplace representatives.) In their own institute, the students described their working with other students either in terms of teacher-led activities or working together with the teacher(s). The positive

experience of the combination of workplace-school learning environments as such was a meaningful co-determinant of the presage factors.

Teachers

The three most central presage factors that were apparent in the teachers' interviews were: (1) a strong professional education (many of them had multiple degrees); (2) previous work experience outside of aUAS; and (3) being recently involved in project work together with a workplace partner (but not necessarily involving students). Factors related to the contexts were similar to those mentioned by the students; both the UASes and workplaces showed positive attitudes toward the development of work-related study modules. The teachers stated that, in both contexts, there were such situations or developmental projects that supported their development of the work-related study module. For example, some teachers said that, in their UAS, teacher collaboration had been simultaneously developed, and it also supported the development of workplace partnerships. The wider developmental approach of the UAS teacher teamwork was seen as meaningful for the quality of the organisation of work-related studying. Here, support from the management was considered to be important, as the following quotation suggests:

"[...] our Chief Learning Officer was truly a person who advocated work-related projects. So, it was easy to speak to her first about developing such a thing. She was very favourable and sympathetic toward a solution like this."

Workplace partners

The interviewed representatives from workplaces also had a varied or comprehensive professional education. Like the teachers, they had plenty of work experience. They also had a common understanding about the need for workplace development in collaboration with UASes, and they aimed to create a setting for that in their companies. The workplace partners stressed that the student projects make it possible for workplaces to meet development needs for which their own staff did not have time. In the following quotation, the workplace partner also explicates broader societal values as motivation for organising work-related learning together with UASes:

"An important reason for us to be involved is a kind of social responsibility, and of course our desire to develop the field and related studies. We wished to slightly open the curtain, so students

could think more about their future employability already during their studies and get to know what would be required of them in working life after graduation.”

Students’ learning processes in the work-related study modules

In the following sections, we describe, in particular, the findings pertaining to what happened during the work-related study modules.

Students

According to interviews with students, their learning during the work-related study modules had three specific main characteristics that distinguished work-related learning from typical classroom learning. Firstly, students’ learning in these study modules took place in small groups or teams. During the study modules, students could participate in many groups or teams. However, students also had their own small group or team across all study module sessions. Students’ division into the study groups and teams took place according to their own interest or type of assignment, but in certain cases teachers decided the distribution. Individual forms of learning and teaching, such as writing a learning journal, were used in the long-term, work-related study modules as well. However, in general, collaborative learning and teaching were applied in the study modules.

Secondly, the learning by students in the work-related study modules involved an actual task or action, such as project work or another assignment from a partner company or organisation. In other words, students’ work in these study modules was based on authentic projects and assignments from workplaces rather than on artificial or theoretical tasks. Some students who had previous work experience described that, while working on their assignments, they reflected on their current work by recalling their past work experiences, as was pointed out in the second interview example of students’ presage factors.

Thirdly, in these study modules, students were responsible for their own work and learning. On the one hand, this was because the students had to meet the requirements of working life. On the other hand, the teachers aimed to put the students themselves in charge of their own work and learning. In the following quotation the student reflects on the strengthened agency and experience of demand for responsible problem solving and integrative thinking (see chapter I)

requiring application of theoretical knowledge about economic budgeting when carrying out the project assignment:

“In my view, the situation is such that we are truly doing work-based things, which I find to be a very good thing. We are actually doing a ‘real’ thing, something that can actually be realized. And it gives you a kind of true responsibility for the job. We can’t just make up something without being reasonable and thinking about our budget, so that we won’t exceed our financial resources.”

Teachers

Because students’ learning with others was so prevalent, teachers had to be experts in the guidance of collaborative learning. In some cases, they had to supervise sharing the work tasks evenly among team members and modifying the tasks on the spot while reflecting on what was happening. The teachers’ guidance toward students’ starting with a new approach to learning, collaborative learning, is explicit in the following quotation:

“Well, they [students] had some problems at the start, because they were unaware of what they should do. They said that, until now, teachers had always taught all that they have to know, but now they had to think and do it themselves. And we [the teacher and colleague] were just there, talking with them, providing support and giving tips about how to do this or that. It was somewhat alarming, having us question whether what we had done before was too much. So, we learned very much indeed. On the whole, it was great.”

Students were not the only ones collaborating with others; the teachers also worked with students and colleagues. For example, only one of the examined study modules was organised by a single teacher; two or more teachers took care of all the other study modules. It is noteworthy that references were no longer made to ‘teaching’; the role of the teachers seemed to be more like that of an organiser, coach, guide or expert in their domain. For example, when a UAS received a new project or assignment from a business, the teachers had to consider, among other aspects, which part of their study module would be suitable for carrying out the assignment. Teachers had to be resourceful, versatile and pedagogically proficient; they also had to network effectively with workplace partners. In general, the following characteristics were observed in teachers’ organisation of the work-related study modules: (1) coordination of larger study modules within the curriculum (small study modules were integrated into one large study module); (2)

multidisciplinary study modules (students from different fields worked together on joint projects); (3) ongoing learning environments (students stepped in and out of study modules as they wished); and (4) versatile assessment forms and practices (for example, formative assessment, self-assessment, and peer assessment).

Workplace partners

In the small companies, the representatives from workplaces often worked together with students in the examined study modules. They acted as experts and as senior colleagues in their own fields. In the workplace, they helped the students to plan their work and guided students' work and learning. The workplace supervisors also learned about their own guidance practices during the process, as the following quotation shows:

“In our experience, we have found it to be important that, when you work with students, you define exactly what you want and what your goals are. It’s important to make a good plan so that students don’t get confused.”

In the large companies, in contrast, the interviewees were not in a position to participate in students' work at the workplaces. Therefore, they did not have an opinion on or an experience of working with the students. Instead, they were in charge of creating or maintaining the partnerships with the UASes on a more general level (such as the agreement between their company and any UAS).

Products of students' learning in the work-related study modules

Students

From the perspective of students, what the data revealed about the products of work-related learning was, firstly, in particular, that the students felt they had learned a lot from the work-related study modules when they studied as part of a group or team. Both the authentic tasks and the need for real collaboration contrasted traditional school learning, and were experienced to be more demanding. For example, the students felt that they learned to discover and respect other students' different points of view and to give and receive feedback. In multidisciplinary groups, they felt that they were given an opportunity to act as experts in their own field. They also felt

that they had developed through the group work as well. Below is an example of a positive experience of developing group work skills:

“Somehow, my former experience of group work was that there was always one person who did everything and other members who didn’t do anything. But here, all students worked very well. And when we got feedback on our working, we were able to improve our collaboration too.”

Secondly, the students expressed experiencing an increase in their motivation. They found their experience from the work-related study modules very motivational because this work was real and concrete. They had a real responsibility for their own actions in these study modules, which also motivated them. Thirdly, they felt that they were getting useful experience from the world of work when they worked in these study modules. For example, they mentioned that they learned the practices and experienced the rhythm of a working life in their own field. They appreciated these experiences, because they provided the opportunity to see and get acquainted with several companies and organisations as well as network with the professionals.

Teachers

From the teacher perspective, three main outcomes of the work-related study modules emerged. Firstly, the teachers felt that, along with acting in the work-related study modules, they were able to develop a closer and deeper relationship with businesses and public sector organisations. Secondly, the teachers also felt that acting in these study modules developed their capacity as teachers because it required courage, boldness, the ability to endure uncertainty, and pedagogical agility. At times, teachers felt they had to stretch their capacities and find ways to be flexible in order to combine their own pedagogic, subject to teacher interests and the interests of the workplace projects, as shown in the teacher’s following comment:

“When we got this [assignment from the company], we already had all the teaching planned for the autumn semester. So, it caused a real stress peak and we asked ourselves: ‘What should we do now? How can we make it through?’ As subject teachers in the field, we realised that the time we had for planning and carrying it out was extremely short.”

At the same time, all of this increased their trust in the students as they had to give the students responsibility and then trust them. Thirdly, the teachers also saw benefits for the students in these study modules. Learning that took place in groups and teams more strongly committed the

students to their studies than did the regular studies, as demonstrated by the student dropout rate clearly having been lower during these study modules.

Workplace partners

Finally, the workplace representatives brought up that they were very satisfied with the collaboration with the UASes in these work-related study modules. They had gained concrete benefits from this collaboration, such as products, services, or help in recruiting. They were very enthusiastic about continuing this collaboration with UASes. The following comment of a workplace supervisor describes the overall satisfaction in short:

“Actually, we have always gotten what we expected and ordered, and we are pretty happy with that.”

The main findings are summarised in Table 1.

Figure 1.

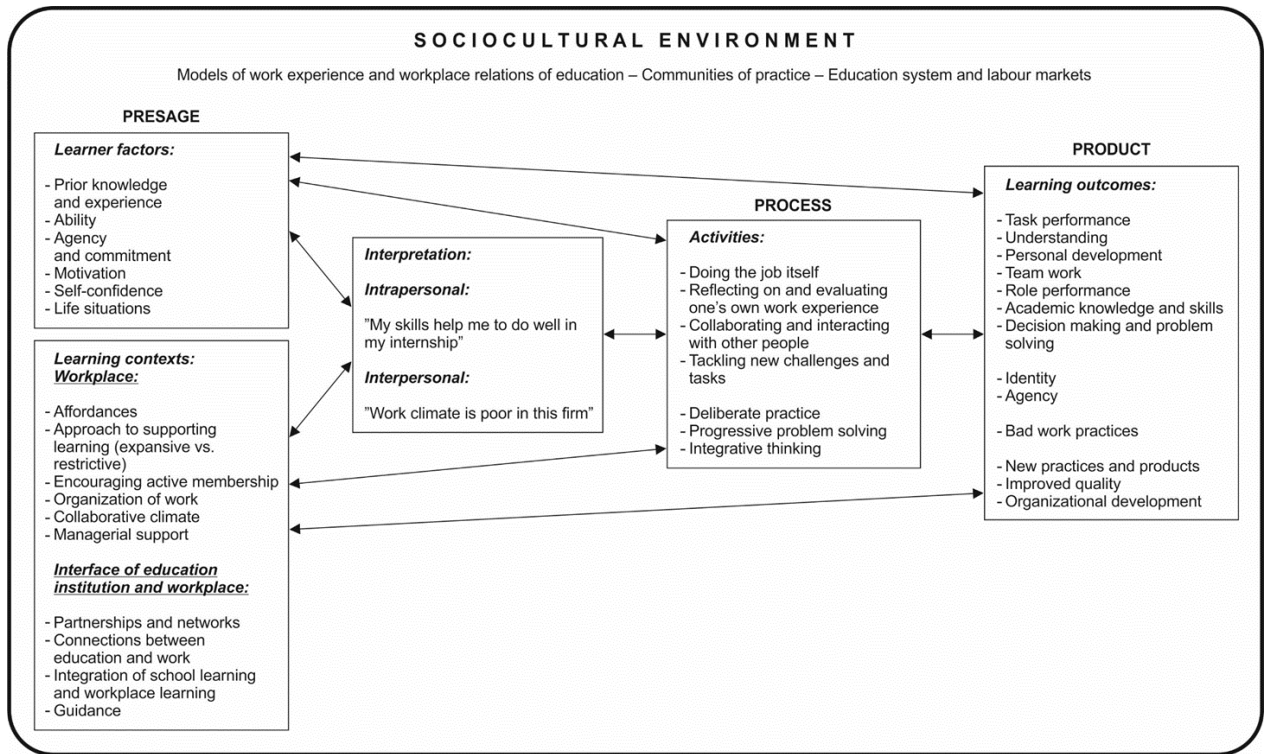


Table 1. *Presage, Process, and Product factors of Students' Learning in Work-Related Study Modules From the Perspectives of the Students, Teachers and Workplace Representatives*

	Students	Teachers	Workplace representatives
Presage factors of students' learning in the work-related study modules	<p><i>Factors related to students:</i></p> <ul style="list-style-type: none"> * Age and class * Previous work experiences and earlier studies <p><i>Factors related to the context:</i></p> <ul style="list-style-type: none"> * Working together with teachers, and guidance by teachers * guidance and encouragement from workplace representatives 	<p><i>Factors related to teachers:</i></p> <ul style="list-style-type: none"> * Strong vocational/professional education * Work experience also outside of the UAS * Being involved in project work with workplace partners <p><i>Factors related to the context:</i></p> <ul style="list-style-type: none"> * Positive attitude of both the UAS and workplaces toward the development of work-related study modules * Broader, multidisciplinary and continuing learning environments (including assessment practices) 	<p><i>Factors related to workplace partners:</i></p> <ul style="list-style-type: none"> * Varied work experience and education * Interest in the development work with the UAS <p><i>Factors related to the context:</i></p> <ul style="list-style-type: none"> * Social responsibility * Expected benefit for the organisation
Students' learning processes during the work-related study modules	<ul style="list-style-type: none"> * Collaborative learning with other students and workplace employees * Working on authentic/concrete project/assignments from the workplace * Reflection on experiences * Students' own responsibility for learning and actions 	<ul style="list-style-type: none"> * Guidance of collaborative learning * Working together with students (and teacher colleagues) 	<p>Either:</p> <ul style="list-style-type: none"> * Working together with students or as an expert guide in the work-related study modules; learning about guidance needs and students' task planning <p>Or:</p> <ul style="list-style-type: none"> * Taking care of agreements
Products of students' learning in the work-related study modules	<ul style="list-style-type: none"> * Generic skills (e.g., group work, planning, coordination) * Responsibility * Increased motivation * Workplace practices (e.g., rhythm of working life) * Acting as expert and networking 	<ul style="list-style-type: none"> * Closer and deeper relationship with the workplaces * Professional development as a teacher * Dropout of students decreased 	<ul style="list-style-type: none"> * Satisfaction regarding the collaboration with the UAS and its outcomes * Concrete benefits: products and services * Help in recruitment

UAS = university of applied sciences

5 Discussion

In this chapter, we have presented the findings of our study, which focused on practices aimed at strengthening connectivity between Finnish higher education institutions and workplaces. While there exist quite a lot of empirical studies on the benefits and challenges of work-related learning regarding students, studies combining multi-actor views are scarce. Our study contributes to this perspective. We examined students', teachers' and their workplace partners' experiences of work-integrated study modules in Finnish universities of applied sciences (UASes). As an analytic framework, we used the 3-P Model of Student Learning at the Workplace adopted from the previous model concerning workplace learning of employees (Tynjälä, 2013). Our study shows that, in general, all three parties of the education–work collaboration experienced the connections between the UASes and workplaces as fruitful.

Regarding the presage factors of learning, the role of previous experience emerged as an important background factor of education–work activities in all parties. For young and inexperienced students, the new ways of working and novel learning environments at the interface of education and work were challenging, yet motivating. For the teachers and representatives of the workplaces, it seemed that only individuals with diverse experience actively participated in partnership activities. On the one hand, the findings indicate that it is important to provide special guidance for students when practice-based learning is integrated in study modules, as Billett (2015) has recommended. On the other hand, it seems that guidance, both at the education institution and at the workplace, is in good hands as workplace relations and student guidance are delegated to experienced professionals. However, it is important to keep in mind that at the workplace experienced professionals seldom have pedagogical training and therefore their experience does not automatically make them optimal guides for students.

As for the student learning processes, three dominating features appeared: the emphasis on collaborative learning, working with authentic tasks, and responsibility. For teachers and representatives from the workplaces, the processes of education–work partnerships included working with students as experts and, at the same time, guiding the work processes and collaboration. A striking finding related to the learning processes was that neither the students nor the teachers or workplace interviewees spoke about the students' thinking activities, reflection on practical experiences, or connection-making between theoretical and practical knowledge, not to mention speaking of learning. Thus, it seems that students' and teachers' focus

was merely on completing day-to-day tasks rather than on reflection or on integrating theory and practice. Previous studies (e.g., Billett, 2015; Delany & Watkin, 2009; Heikkinen et al., 2011; Virtanen et al., 2014; Tynjälä et al., 2016; Täks et al., 2014; Ortoleva & Bétrancourt, 2015) have shown that reflective activities, where students critically examine their experiences and integrate theory and practice, deepen learning. Without these kinds of activities, pointed out in the Connective Model of Work Experience (Guile & Griffiths, 2001, see [chapter 1.1 and 1.3](#)) and in the Integrative Pedagogy model (e.g., Tynjälä et al., 2020, [see chapter 1.1](#)) as well as 3-P model, practical experience may remain separate from conceptual understanding. However, it may be possible that the integration of theory and practice was so deeply embedded in the learning processes that the interviewees felt this was too self-evident to need to be pointed out. Also, it may be possible that integrative learning processes could be better captured through observation than interviews. In future studies, it is also important to specifically ask for examples of applied reflective and integrative learning tasks and processes.

While the reflective and integrative processes remained hidden or non-existent, according to the interviews, another important process element of the 3-P model, problem solving, clearly emerged from the interviews, though implicitly. The participants of the study seldom explicitly mentioned problem solving as an activity, but in their descriptions of working with authentic assignments or projects, they described processes typical of problem solving.

In the interviews, all three types of participants — students, teachers, and workplace partners — produced rich descriptions of the product factors of the 3-P model, that is, the outcomes of the work-related study modules. Naturally, the students paid attention to their developed skills and learning of workplace practices, as well as responsibility, whereas the teachers had a broader perspective and recognised not only the development of students' skills and increase in their motivation, but also the decrease in the student dropout rate. Teachers also regarded the result of closer relationships with workplaces, in and of itself, as an important outcome. Unlike in the study by Kumpulainen and colleagues (2019, also [see chapter 1.1](#)), the teachers in the present study seldom referred to challenges with respect to guiding students in their work-related assignments. Instead, they saw the development of work-integrated study modules as supporting their professional development and expanding their professional spheres. This strong, positive attitude toward work-integrated learning may stem from the teachers' long experience both within and outside the UASes. The workplace partners were as satisfied as the students and teachers in terms of the outcomes of their education–work collaboration, in particular since the

students' projects resulted in new products, services and employees for the companies and organisations.

When considered from the perspective of the Connective Model of Work Experience (Guile & Griffiths, 2001; Griffiths & Guile, 2003), the work-related study modules of the Finnish universities of applied sciences seem to have had the aim of following this model: students were supported to cross boundaries between education and work. However, on the basis of students' and teachers' descriptions, little explicit and intentional integration and connection making seem to have taken place between academic and work-related learning. It seems that students had opportunities to apply theoretical knowledge to practice and even develop something new, but preparation for the requirements of workplaces and also critical reflection on experiences in the light of conceptual knowledge seem to have remained scarce. Thus, while the elements of boundary crossing and resituating learning of the Connective model seem to have been realized at least to some extent, the elements of critical thinking and dialogical inquiry did not appear very strongly in the data. It may be possible as well, as mentioned earlier, that the interview method did not capture all the nuances of connectivity.

In regard to planning connectivity, the following practical implications can be raised on the basis of our findings (see also Billett, 2015):

It is important to:

- inform students about the practices and procedures of work-integrated learning beforehand;
- encourage initiative and active learning in students;
- make sure that students have guidance available both at the workplace and education institute;
- provide students with opportunities to reflect on their practical experiences in the light of theories and with the help of conceptual tools;
- make an agreement with the workplace partner regarding the goals, guidance and assessment practices.

In sum, in the present study, students reported on the usefulness of collaborative learning processes and diverse learning outcomes, and the teachers confirmed the students' observations. Furthermore, the teachers felt that their workplace relations deepened, and that the experience of

guiding the students was useful for their own professional development as well. For the workplaces, collaboration with the UASes brought benefits in the form of new products or services as well as the recruitment of new employees or interns.

The main limitations of the present study concern the data collected. Although the size of the interview data was unusually large for a qualitative study (140 participants), the number of workplace participants was small (only 17). This means that the workplace point of view is underrepresented in comparison to that of the other types of participants (88 students and 35 teachers). Also, the selection of interviewees at the workplaces could have been more effective, because many of the interviewees represented the management of the company and were not directly involved in the supervision or guidance of the student assignments. For these reasons, particularly the findings related to the processes of student projects were less profound or less clear regarding the workplace perspective. Regarding the interviewees from the workplace, the findings indicate that, in future studies, it is important to pay more attention to the recruitment criteria for study participants in order to be sure to invite those workplace representatives for interviews who would be directly engaged in the guidance and supervision of the students. Altogether, capturing the process-related elements of the 3-P model—such as deliberate practise, problem solving and integrative thinking—requires more process-oriented data gathering, observation and analytical methods in future studies.

Another limitation related to the data is the fact that the examined study modules were collected as part of two major development projects funded by the Finnish Ministry of Education. In other words, the practices developed in these 11 cases may differ from ones of more typical higher education settings, representing pioneering units, rather than average higher education institutions. Furthermore, the cases we examined are better described as *work-related* rather than work-based practices, since most of the students' work on the commissioned assignments took place in the UAS context. Nevertheless, despite these limitations, it can be concluded that planning and implementing real connective learning environments, in terms of the Connective model (Guile & Griffiths, 2001) and the Integrative Pedagogy model (Tynjälä et al., 2020), requires diverse and high-level professional competence of teachers. Therefore, we recommend incorporating modules of work-integrated learning into the teacher development programmes of universities.

Acknowledgements

We wish to thank our collaborative partners at the participating Finnish universities of applied sciences, the interviewed students, teachers and workplace partners, and the Finnish Ministry of Education and Culture for funding the *eAMK* and *Toteemi* projects, who made it possible to carry out this research. We also thank the editors of this book for their constructive feedback and suggestions for improving the content, and Mr Karl-Heinz Rademacker for polishing the English language.

References

- Argyris, C., & Schön, D. A. (1996). *Organizational learning II: Theory, method and practice*. Reading, MA: Addison-Wesley.
- Bakker, A., & Akkerman, S. (2019). The learning potential of boundary crossing in the vocational curriculum. In L. Unwin & D. Guile (Eds.) *Handbook on Vocational Education* (pp. 351-372). Hoboken, NJ: Wiley.
- Barnett, R., & Jackson, N. (2019). *Ecologies for learning and practice: Emerging ideas, sightings and possibilities*. Milton Park: Routledge.
- Beier, M. E., Kim, M. H., Saterbak, A., Leautaud, V., Bishnoi, S., & Gilberto, J. M. (2019). The effect of authentic project-based learning on attitudes and career aspirations in STEM. *Journal of Research in Science Teaching*, 56(1), 3–23.
- Bereiter, C. (2002). *Education and mind in the knowledge age*. Mahwah, NJ: Erlbaum.
- Bereiter, C., & Scardamalia, M. (1993). *Surpassing ourselves: An inquiry into the nature and implications of expertise*. Chicago, IL: Open Court.
- Biggs, J. (1999). *Teaching for quality learning at university. What the student does*. Buckingham: Society for Research into Higher Education & Open University Press.
- Billett, S. (2002). Workplace pedagogic practices: Co-participation and learning. *British Journal of Educational Studies*, 50(4), 457–481.
- Billett, S. (2015) *Integrating practice-based experiences into higher education*. Dordrecht: Springer.
- Binder, J. F., Baguley, T., Crook, C., & Miller, F. (2015). The academic value of internships: Benefits across disciplines and student backgrounds. *Contemporary Educational Psychology*, 41(C), 73–82. <https://doi.org/10.1016/j.cedpsych.2014.12.001>
- Brooks, R., & Youngson, P. L. (2016). Undergraduate work placements: an analysis of the effects on career progression. *Studies in Higher Education*, 41(9), 1563–1578.
- Davey, T., Meerman, A., Galan Muros, V., Orazbayeva, B., & Baaken, T. (2018). *The state of university-business cooperation in Europe*. Final report. Luxembourg: Publications Office of the European Union. Retrieved from: https://www.ub-cooperation.eu/pdf/final_report2017.pdf

- Delany, C., & Watkin, D. (2009). A study of critical reflection in health professional education: Learning where others are coming from. *Advances in Health Science Education, 14*, 411–429.
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62*(1), 107–115.
- Engeström, Y. (1987). *Learning by expanding: An activity-theoretical approach to developmental research*. Helsinki: Orienta-Konsultit.
- Engeström, Y. (2011). Activity theory and learning at work. In M. Malloch, L. Cairns, K. Evans, & B. O'Connor (Eds.), *The SAGE handbook of workplace learning* (pp. 86–104). Los Angeles, CA: SAGE.
- Elvira, Q., Beusaert, S., Segers, M., Imants, J., & Dankbaar, B. (2016). Development and Validation of a Supportive Learning Environment for Expertise Development Questionnaire (SLEED-Q). *Learning Environments Research, 19*(1), 17–41.
- Eraut, M. (2004). Informal learning in the workplace. *Studies in Continuing Education, 26*(2), 247–273.
- Florida, R. (1995). Toward the learning region. *Futures, 27*(5), 527–536.
- Friman, M., Schreiber, D., & Syrjänen, R., Kokkonen, E., Mutanen, A., & Salminen, J. (2018). Steering sustainable development in higher education - Outcomes from Brazil and Finland. *Journal of Cleaner Production 186*, 364–372.
- Fuller, A., & Unwin, L. (2003). Learning as apprentices in the contemporary workplace: Creating and managing expansive and restrictive participation. *Journal of Education and Work, 16*(1), 5–25.
- Fung, D. (2017). *A connected curriculum for higher education*. London: UCLPress
- Griffiths, T., & Guile, D. (2003). A connective model of learning: The implications for work process knowledge. *European Educational Research Journal, 2*(1), 56–73.
- Godfrey, D., & Brown, C. (Eds.). (2019). *An Ecosystem for Research-Engaged Schools: Reforming Education Through Research*. Routledge.
- Guile, D., & Griffiths, T. (2001). Learning through work experience. *Journal of Education and Work, 14*(1), 113–131.
- Gruber, H., & Harteis, C. (2018). *Individual and social influences of professional learning. Supporting the acquisition and maintenance of expertise*. Cham: Springer.
- Heikkinen, H., Tynjälä, P., & Kiviniemi, U. (2011). Integrative pedagogy in practicum. In M. Mattsson, T.V. Eilertsen and D. Rorrison (Eds.), *A Practicum Turn in Teacher Education* (pp. 91–112). Rotterdam: Sense Publishers.
- Helle, L., Tynjälä, P., Olkinuora, E. & Lonka, K. (2007). "Ain't nothin' like the real thing" Motivation and study processes in university-level project studies. *British Journal of Educational Psychology, 77*(2), 397–411.

- Illeris, K. (2004). A model for learning in working life. *Journal of Workplace Learning*, 16(8), 431–441.
- Irwin, A., Nordmann, E., & Simms, K. (2019). Stakeholder perception of student employability: Does the duration, type and location of work experience matter?. *Higher Education*, 78(5), 761–781.
- Jackson, D., & Collings, D. (2018). The influence of work-integrated learning and paid work during studies on graduate employment and underemployment. *Higher Education*, 76(3), 403–425.
- Kallio, E. (2011). Integrative thinking is the key: An evaluation of current research into the development of thinking in adults. *Theory & Psychology*, 21(6), 785–801.
- Kemmis, S., & Heikkinen, H. (2012). Future perspectives: Peer-group mentoring and international practices for teacher development. In H. Heikkinen, H. Jokinen, & P. Tynjälä (Eds.), *Peer-group mentoring for teacher development* (pp. 144–170). Milton Park: Routledge.
- King, N., Horrocks, C., & Brooks, J. (2018). *Interviews in qualitative research*. SAGE Publications Limited. 2nd ed.
- Kotila, H. & Vanhanan-Nuutinen (Eds.) 2019. Työn ja oppimisen liitto. Haaga-Helia. http://www.haaga-helia.fi/sites/default/files/Kuvat-ja-liitteet/Tutkimus-ja-kehittaminen/julkaisut/hh_toteemi_web.pdf?userLang=fi [In Finnish]
- Koskinen, M. I., Nakamura, R., Yli-Knuuttila, H., & Tyrväinen, P. (Eds.) Kohti oppimisen uutta ekosysteemiä. Jyväskylä: Jyväskylän ammattikorkeakoulu, 12-15. <http://urn.fi/URN:ISBN:978-951-830-562-3> [In Finnish]
- Kumpulainen, K., Vierimaa, S., & Koskinen-Koivisto, E. (2019). Developing connective pedagogy in cultural research – A case study from the teachers’ perspective in a adopting a problem-based approach in higher education. *Education Sciences* 9, 252. <https://doi.org/10.3390/educsci9040252>
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Mann, K., Gordon, J., & MacLeod, A. (2009). Reflection and reflective practice in health professions education: A systematic review. *Advances in Health Sciences Education, Theory and Practice*, 14, 595–621.
- Marsick, V., Watkins, K., & O’Connor, B.N. (2010). Researching workplace learning in the United States. In M. Malloch, L. Cairns, K. Evans, & B.N. O’Connor (Eds.), *The SAGE handbook of workplace learning* (pp.198–209). Thousand Oaks, Ca: SAGE.
- Le Maistre, C., & Paré, A. (2006). A typology of knowledge demonstrated by beginning professionals. In P. Tynjälä, J. Välimaa, & G. Boulton-Lewis (Eds.), *Higher education and work: Collaborations, confrontations and challenges* (pp. 103–113). Amsterdam: Elsevier.
- Loi, M., & Di Guardo, M.C. (2015). The third mission of universities: An investigation of the espoused values. *Science and Public Policy*, 42(6), 855–870.

- Naidoo, K. L., Wyk, J. M. V., & Adhikari, M. (2017). The learning environment of paediatric interns in South Africa. *BMC Medical Education*, *17*(1), 1–10. <https://doi.org/10.1186/s12909-017-1080-3>
- Nedelkoska, L., & Quintini, G. (2018). *Automation, skills use and training*. OECD Social, Employment and Migration Working Papers, No. 202, OECD Publishing, Paris. <https://doi.org/10.1787/2e2f4eea-en>
- Ortoleva, G., & Bétrancourt, M. (2016). Supporting productive collaboration in a computer-supported instructional activity: Peer-feedback on critical incidents in health care education. *Journal of Vocational Education & Training*, *68*(2), 178–197.
- Puhakka, A., Rautopuro, J., Tuominen, V., & Vuorinen-Lampila, P. (2012). Current employability and graduate employment research in Finland. In S. Ahola, & D. M. Hoffman (Eds.), *Higher education research in Finland* (pp. 357–381).. University of Jyväskylä, Finnish Institute for Educational Research.
- Ross, A., Naidoo, C. S. S., & Dlamini, S. (2018). An evaluation of the medical internship programme at King Edward VIII hospital, South Africa in 2016. *South African Family Practice*, *60* (6), 187–191. <https://doi.org/10.1080/20786190.2018.1504866>
- Sappa, V., & Aprea, C. (2014). Conceptions of connectivity. How Swiss teachers, trainers and apprentices perceive vocational training and teaching across different learning sites. *Vocations and Learning*, *7*(3), 263–287.
- Sappa, V., Choy, S., & Aprea, C. (2016). Stakeholders’ conceptions of connecting learning at different sites in the national VET systems. *Journal of Vocational Education and Training*, *68*(3), 283–301.
- Schomburg, H., & Teichler, U. (2011). *Employability and and Mobility of Bachelor Graduates in Europe: Key Results of the Bologna Process*. Rotterdam: Sense.
- Silva, P., Lopes, B. Costa, M., Melo, A. I. Paiva Dias, G., Brito, E., & Seabra, D. (2018). The million-dollar question: Can internships boost employment? *Studies in Higher Education*, *43*(1), 2–21.
- Teichler, U. (2013). Universities between the expectations to generate professionally competences and academic freedom experiences from Europe. *Procedia - Social and Behavioral Sciences*, *77*, 421–428. <https://doi.org/10.1016/j.sbspro.2013.03.097>
- Tynjälä, P. (2008). Perspectives into learning at the workplace. *Educational Research Review* *3*, 130–154.
- Tynjälä, P. (2009). Connectivity and transformation in work-related learning – Theoretical foundations. In M.-L. Stenström, & P. Tynjälä (Eds.), *Towards integration of work and learning: Strategies for connectivity and transformation* (pp. 11–37). Springer.
- Tynjälä, P. (2013). Toward a 3-P model of workplace learning: A literature review. *Vocations and Learning*, *6*(1), 11–36. <https://doi.org/10.1007/s12186-012-9091-z>
- Tynjälä, P., Heikkinen, H., & Kallio, E. (2020). Integrating work and learning in higher education and VET: Theoretical point of view. In L. Cairns, M. Malloch, & B. O’Connor (Eds.), *SAGE handbook of learning and work*. In preparation.

Tynjälä, P., Pirhonen, M., & Vartiainen, T. (2009). Educating IT project managers – How to meet working life requirements. *Communications of the Association for Information Systems* 24(Article 16), 270–288. <http://aisel.aisnet.org/cais/>

Tynjälä, P. & Newton, J.M. (2014). Transitions to working life: Securing professional competence. In S. Billett, C. Harteis & H. Gruber (Eds) *International handbook of research in professional and practice-based learning*. Springer International Handbooks of Education Volume 1. (pp. 513–534). Dordrecht: Springer.

Tynjälä, P., Virolainen, M., Heikkinen, H., & Virtanen, A. (2020). Promoting cooperation between educational institutions and workplaces: Models of integrative pedagogy and connectivity revisited. *Zeitschrift für Berufspädagogik* (in print).

Tynjälä, P., Virtanen, A., Klemola, U., Kostianen, E., & Rasku-Puttonen, H. (2016). Developing social competence and other generic skills in teacher education: applying the model of integrative pedagogy. *European Journal of Teacher Education*, 39(3), 368–387.

Täks, M., Tynjälä P., Toding, M., Venesaar, U., & Kukemelk, H. (2014). Engineering students' experiences of studying entrepreneurship. *Journal of Engineering Education*, 103(4), 573–598.

Virtanen, A., Tynjälä, P., & Eteläpelto, A. (2014). Factors promoting vocational students' learning at work: Study on student experiences. *Journal of Education and Work*, 27(1), 43-70.

Wals, A. E., Tassone, V. C., Hampson, G. P., & Reams, J. (2015). Learning for walking the change: Eco-social innovation through sustainability-oriented higher education. In M. Barth, G. Michelsen, M. Rieckmann, & I. Thomas (Eds.), *Routledge handbook of higher education for sustainable development* (pp. 49–63). Milton Park: Routledge,

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge, England: Cambridge University Press.

Zomer, A., & Benneworth, P. (2011). The rise of the university's third mission. In J. Enders, H.F. de Boer, & D.F. Westerheijden (Eds.), *Reform in higher education in Europe* (pp. 81–101). Rotterdam: Sense.