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A MULTIMETHOD EXAMINATION OF CONTRIBUTORS TO SUCCESSFUL ON-THE-JOB LEARNING FOR VOCATIONAL STUDENTS

Thesis for the degree of Doctor of Science (Economics and Business Administration) to be presented with due permission for public examination and criticism in the Auditorium 1303 at Lappeenranta University of Technology, Lappeenranta, Finland on the 18th of December, 2014, at noon.

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ABSTRACT

Sari Metso
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Rapid changes in working life and competence requirements of different professions have increased interest in workplace learning. It is considered an effective way to learn and update professional skills by performing daily tasks in an authentic environment. Especially, ensuring a supply of skilled future workers is a crucial issue for firms facing tight competition and a shortage of competent employees due to the retirement of current professionals. In order to develop and make the most of workplace learning, it is important to focus on workplace learning environments and the individual characteristics of those participating in workplace learning. The literature has suggested various factors that influence adults' and professionals' workplace learning of profession-related skills, but lacks empirical studies on contextual and individual-related factors that positively affect students' workplace learning. Workers with vocational education form a large group in modern firms. Therefore, elements of vocational students' successful workplace learning during their studies, before starting their career paths, need to be examined. To fill this gap in the literature, this dissertation examines contributors to vocational students' workplace learning in Finland, where students' workplace learning is included in the vocational education and training system.

The study is divided into two parts: the introduction, comprised of the overview of the relevant literature and the conclusion of the entire study, and five separate articles. Three of the articles utilize quantitative methods and two use qualitative methods to examine factors that contribute to vocational students' workplace learning. The results show that, from the students' perspective, attitudinal, motivational, and organization-related factors enhance the student's development of professionalism during the on-the-job learning period. Specifically, the organization-related factors such as innovative climate, guidance, and interactions with seniors have a strong positive impact on the students' perceived development of professional skills because, for example, the seniors' guidance and provision of new viewpoints for the tasks helps the vocational students to gain autonomy at work performance. A multilevel analysis shows that of those factors enhancing workplace learning from the student perspective, innovative climate, knowledge transfer accuracy, and the students' performance orientation were significantly related to the workplace instructors' assessment regarding the students' professional performance. Furthermore, support from senior colleagues and the students' self-efficacy were both significantly associated with the formal grades measuring how well the students managed to learn necessary professional skills. In addition, the results suggest that the students' on-the-job learning can be divided into three main phases, of which two require efforts from both the student and the on-the-job learning organization. The first phase includes the student's application of basic professional skills, demonstration of potential in performing daily tasks, and orientation provided by the organization at the beginning of the on-the-job learning period. In the second phase, the student actively develops profession-related skills by performing daily tasks, thus learning a fluent working style while observing the seniors' performance. The organization offers relevant tasks and follows the student's development. The third level indicates a student who has reached the professional level described as a full member of the work community, demonstrated to have the skills necessary for tasks typical for a specific

occupation. The results suggest that constructing the vocational students' successful on-the-job learning period requires feedback from seniors, opportunities to learn to manage entire work processes, self-efficacy on the part of the students, proactive behavior, and initiative in learning. The study contributes to research on workplace learning in three ways: firstly, it identifies the key individual- and organization-based factors that influence the vocational students' successful on-the-job learning from their perspective and examines mutual relationships between these factors. Second, the study provides knowledge of how the factors related to the students' view of successful workplace learning are associated with the workplace instructors' perspective and the formal grades. Third, the present study finds elements needed to construct a successful on-the-job learning for the students.

Keywords: vocational education and training (VET), vocational students, on-the-job learning, workplace learning setting, individual characteristics

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The journey of writing my doctoral thesis has been simultaneously inspiring and demanding. I was totally carried away by the theme of the dissertation but had to limit my enthusiasm for research to after office hours. Concluding this journey took a lot of anticipation, careful planning and scheduling. Fortunately, I found an accord between my day job and night research. At this point it is time to thank those that gave me invaluable support, guidance and comments during this research.

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Kouvola, November 2014

Sari Metso

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2. Metso, S. (2013). **Vocational students' perspective on organizational factors enhancing workplace learning.** *Education + Training Vol. 56, No. 5, pp. 381-396.*

3. Metso, S. & Nisula, A-M. (2014). **Vocational students' workplace learning: A multilevel analysis of survey data from students, workplace instructors, and grade** (In review process)

4. Metso, S., & Kianto, A. (2012). **How are professional skills acquired? A structured process of on-the-job learning.** In P. Ordoñes de Pablos and M.D. Lytras (Eds.), *Knowledge Management and Drivers of Innovation in Services Industries* (pp.26-40). Pennsylvania: IGI Global

5. Metso, S., & Kianto, A. (2014). **Exploring the contributors of successful development of professional skills during workplace learning periods** (In review process)

The contribution of Sari Metso to the articles:

1. Developed the research plan and coordinated the writing of the paper. Collected and analyzed the quantitative data. Wrote most of the paper. Was mainly responsible for revising the paper during the journal review process.

2. Sole author.

3. Developed the research plan and coordinated the writing of the paper. Wrote the theoretical part of the paper including formulation of the hypotheses, methodology, and discussion. Was mainly responsible for revising the paper during the journal review process.

4. Developed the research plan and coordinated the writing of the paper. Collected and analyzed the qualitative data. Wrote most of the paper. Was mainly responsible for revising the paper during the journal review process.

5. Developed the research plan and coordinated the writing of the paper. Collected and analyzed the qualitative data. Wrote most of the paper. Was mainly responsible for revising the paper during the journal review process.

PART I: OVERVIEW OF THE DISSERTATION

1. INTRODUCTION

1.1. Research background and motivation

Modern firms face the principle of "knowledge is only useful for those who can effectively learn, and learning is only effective if useful knowledge is available." (Strong et al., 2008: 150). The knowledge-based view of the firm (Grant, 1996; Kogut & Zander, 1992; Spender, 1996) emphasizes knowledge as the key driver of superior organizational performance, competitiveness, and value creation (Alavi & Leidner, 2001; Spender, 1996). Hence, knowledge creation, acquisition, and application are central actions for organizations (Sousa & Hendriks, 2006). Individuals are seen to have a major role in creating and possessing knowledge, and the main task of organizations is to manage the employees' specialist knowledge in order to produce goods and services (Grant, 1996: 120). As knowledge is considered the most important asset in production, organizations are increasingly interested in learning. The organizations that are capable of continuous learning and adapting can stand out from their competitors (Li et al., 2009). Specifically, successful learning transfer among the organizational members is a crucial issue. In sum, learning is vital for modern organizations because their environment is constantly changing, which requires effective learning that improves the ability of organizations to benefit from opportunities, generate profits, and survive threats (Hannah & Lester, 2009). In this environment, workplace learning as a means to obtain appropriate knowledge today and in the future has garnered increased interest (Collin & Tynjälä, 2003; Harteis & Billett, 2008).

The academic literature has considered workplace learning an important issue for organizations in terms of the workers' flexible learning of frequently-changing professional skills (Colley, 2012; Dymock & Gerber, 2002; Guile & Okumoto, 2008; Sauter, 1999; Sinha, 2012). Workplace learning is thus an important tool to support organizational renewal capability and increase employee competence (Felstead et al., 2010; Lans et al., 2008; Leonard-Barton, 1992; Leslie et al., 1998; Schmitt et al., 2012). Furthermore, most of the employees' specialist knowledge concerning, for example, the production process, customers, the organization, and the industry resides in their tacit knowledge (Smith, 2001), which is not readily transferable to others. However, along with the retirement of the baby-boom generation (Koc-Menard, 2009), Finland and other industrialized countries are facing a loss of knowledgeable employees and their tacit knowledge.

Students' workplace learning can mitigate this problem by providing a means to convey the present employees' professional skills and knowledge to younger workers just ready to enter the job market. In fact, it has been argued that workplace learning is an appropriate environment, sometimes the only plausible one, for the learning of professional skills (Sauter, 1999; Streeck, 1989).

Workplace learning has been studied widely (Billett, 2001, 2004; Engeström et al., 1995; Eraut, 2004; Gherardi, 2001; Leslie et al., 1998). Workplaces as learning environments can be used to achieve different learning goals depending on the target groups and desired results (Nieuwenhuis & van Woerkom, 2007). Thus far, however, the literature has mainly focused on professional skills development for the current employees (Amenumey & Lockwood, 2008; Karakowsky & McBey, 1999), and there are only a few empirical studies examining the effect of various factors on students' workplace learning of professional skills (Virtanen et al., 2014). Furthermore, the literature seems to emphasize primarily the importance of firms in enhancing or preventing workplace learning. Previous studies have found that the managers' role (Bryson et al., 2006), structured guidance (Billett, 2001), an innovative environment (Laurillard, 1999), and social and informal interaction at workplaces (Aksu and Özdemir, 2005) influence workplace learning. In addition, the literature has suggested that individuals' goal orientation (Sujan et al., 1994), initiative in learning (Billett, 2004), and self-efficacy (Hurley, 2002) influence learning at work as well. The joint influence of organization- and individual characteristics-related factors influencing on-the-job learning is a field that is not as well understood.

It is crucial to increase understanding of the students' aspect in workplace learning because students are the future workforce who can potentially replace the retiring baby boomers. When the seniors' tacit knowledge (Smith, 2001) is conveyed to the juniors, it enhances the students' learning of expertise (Dornan et al., 2007) and provides them with up-to-date skills; furthermore, workplace learning is considered necessary for the development of professional skills (Collin & Tynjälä, 2003). Organizations have a valuable knowledge asset in their hands in the form of students performing their training periods at the final stages of their studies. These students already possess basic abstract and practical knowledge of the profession studied and they will soon enter the job market. In this phase, firms have an excellent opportunity to mold the students' professional skills according to their needs and at the same time take into account the future needs of the business. In order to make the most of the students' on-the-job learning from the viewpoint of the students,

firms, and schools it is important to study and identify organization- and individual-related contributors to successful workplace learning.

Specifically, it is important to examine the vocational students' on-the-job learning because workers performing practical tasks are a large and increasing group within the labor force (Eurostat, 2010). For example, in Finland 41 percent of the graduates from compulsory education in 2010 continued on to vocational education (Statistics Finland, 2010). A further motivation to examine the vocational students' workplace learning is that it has been demonstrated that professional learning is most successful in normal, daily situations in authentic environments (Felstead et al., 2010). A common way to acquire competence required in practical jobs is vocational education. The vocational professionals' knowledge is practical (Albrecht et al., 2009; Mascha, 2001) defined as knowledge of how to use different methods and strategies in specific situations, personal, expressed through actions, and crucial in skillful decision-making (Albrecht et al., 2009; Mascha, 2001; Matsuo & Kusumi, 2002; Rix & Lièvre, 2008).

The current study defines a worker performing practical tasks as a person with specialized non-academic skills, training, or knowledge required by a specific trade, occupation, or vocation (Metso, 2012). Their professions are multifarious; for example, artisan, customer service and salesperson, vehicle mechanic, articulated vehicle driver, bus driver, surface treatment finisher, electrician, ventilation fitter, infrastructure builder, mechanical fitter, joiner, security officer, environmental operative, practical nurse, cook, and travel counselor. Typically, these workers acquire formal competence and initial profession-related skills through vocational education. Successful performance in their professions requires professional qualifications, continuous learning, and work experience. They create new knowledge and skills by performing in changing authentic situations, improve and develop their working methods, and are connected widely within and outside their organizations. Hence, they are involved in the core functions of organizations. With these workers' comprehensive representation in organizations and their substantial influence on everyday functions, it is important to study the contributors to the vocational students' successful learning through work.

This study takes part in academic discussion in the following fields: First, the study is related to the literature examining the newcomers' workplace learning (Tynjälä, 2008; Virolainen, 2007) and second, the literature on

workplaces as the students' learning environments (Collin & Tynjälä, 2003; Dornan et al., 2007) through the main focus of examining contributors to the vocational students' on-the-job learning included in the vocational education and training (VET) system. The focus of this dissertation is on the vocational students' on-the-job learning, but for an audience not interested in this special field, it provides understanding of the multifaceted nature of workplaces as learning environments and individual-related factors enhancing successful learning at work.

1.2 Research gaps and objectives

The main research question of the present study is: How can the on-the-job learning of vocational students be enhanced? Sub-questions following from the main question are the following:

1. What are the factors that positively influence, from a student perspective, vocational students' on-the-job learning?
2. How the relationship between the factors that vocational students consider to enhance on-the-job learning and assessments from workplace instructors differs from the relationship between these factors and formal grade?
3. What factors differentiate the on-the-job learning period of highly successful students from less successful ones?

In general, knowledge and education are considered important resources for modern organizations (Drucker, 2000). An important issue for firms is how to develop a skilled workforce. Correspondingly, VET providers are interested in training competent workers in order to fulfill the firms' requirements (Illeris, 2003). Workplaces are suitable environments for such learning because constantly changing professional skills can be flexibly learned through work (Colley, 2012). Thus, on-the-job learning forms the basic framework for this study. Factors that affect adult learning and the improvement of professionals' skills have been widely studied (Billett, 2001, 2004; Cheetham & Chivers, 2001a; 2001b; Collin & Tynjälä, 2003; Dymock & Gerber, 2002; Engeström et al., 1995; Eraut, 2004; Gherardi, 2001; Leslie et al., 1998; Sauter, 1999). There are some studies examining factors that influence on-the-job learning of novices (Kyndt et al., 2009; Swap et al., 2001) and students (Tynjälä, 2008; Virtanen & Tynjälä, 2008) but few studies have examined the subject from the vocational students' point of view (Virtanen et al., 2014). As firms face challenges due to increased competition, diminishing numbers of workers in the younger generation, mass retirement, and a lack of skillful workers, there is a need to study what enhances the juniors' on-the-job learning, acquiring

professional-related skills required by different industries, in order to understand how organizations can maintain the resource of skilled future employees. To fill in this gap in the existing research, this dissertation focuses on vocational students' on-the-job learning. Specifically, the present study examines on-the-job learning of Finnish vocational students, because VET-based workplace learning in Finland is an established goal-oriented procedure which continuously develops under cooperation between representatives of vocational institutions and working professionals, and is regulated by the Finnish National Board of Education and policy makers.

Several studies have suggested that there are individual- and organization-related factors that affect on-the-job learning (Confessore & Kops, 1998; Kelliher & Henderson, 2006; Mumford, 1992; Schyns & von Collani, 2002; Sujan et al., 1994). This study examines organization-related factors as well as those related to the students' motivation, cognitive models, and attitudes thought to enhance students' on-the-job learning. Although there is knowledge on organization- and individual-related factors that enhance or prevent learning at work from the perspective of various professions (Crouse et al., 2011; Hicks et al., 2007), the joint effect of these factors is poorly understood in the area of vocational students learning professional skills through work. In many countries, VET-based workplace learning is determined and developed mainly in cooperation with agencies responsible for the national development of VET, representatives of vocational institutions and working professionals, and policy makers determine the general framework within which on-the-job learning of vocational students is implemented. Because vocational students are not officially involved in the development of VET-based workplace learning and because organizations and vocational institutions face rapid changes in operational environments, professions, and competence requirements, it is time to acquire knowledge about vocational students' views concerning successful on-the-job learning.

Previous research has provided knowledge about how organization- (Billett, 2001; Bryson et al., 2006; Laurillard, 1999) and individual- (Hurley, 2002; Sujan et al., 1994) related factors affect workplace learning, However, empirical studies regarding the joint effect of these factors on the successful workplace learning of vocational students are very few (Virtanen et al., 2014). The present study contributes by combining a large and versatile set of organization- and individual-related factors, and examining their strength, effect (positive or negative), and possible interdependence on vocational students' successful workplace learning from their point of view. Furthermore, prior research has ignored joint examination of different perspectives on the

successful workplace learning of vocational students. It is important to identify differences between various assessments of workplace learning in order to create common goals for effective and productive workplace learning. The present study examines how organization- and individual-related factors enhancing workplace learning from vocational students' perspective are related to workplace instructors' assessment of successful on-the-job learning and to the formal grades measuring how well students have learned skills required in their future professions.

Organizations need individuals that are willing and able to update work-related skills and learn new ones, especially when work environments are changing and demand quick adaptation in novel circumstances (Potosky, 2010). Under these conditions, it is necessary to identify individual factors that enhance acquisition of up-to-date and new professional skills. Previous studies have recognized the impact of individual factors on learning at work in terms of individual engagement in goal-oriented work practices (Billett, 2001) and individual involvement in learning and development activities related to work such as knowledge sharing, feedback from seniors, maintaining up-to-date skills, and intention to participate and actual participation in employee development (Maurer et al., 2008; Maurer et al., 2003; van Rijn et al., 2013). However, in prior research individual factors that influence on-the-job learning at the initial stages of working life has appeared to get little empirical attention. It is important to examine individual-related factors because they affect juniors' learning of professional skills at work through motivation and taking responsibility for one's own learning (Lohman, 2005). Furthermore, there is not enough knowledge about exactly which individual-related factors contribute to vocational students' professional skills development during workplace learning. To bridge this gap, this study examines the effects of a diversified set of individual factors on vocational students' development of professional skills; also the impact of the vocational students themselves on building successful on-the-job learning periods. In addition, individual-related factors in previous studies are often studied from a perspective of worker and organizational effectiveness, employee commitment to organization, and job satisfaction (Maurer et al., 2008; Maurer et al., 2003; van Rijn et al., 2013). The present study emphasizes that in the era of increasing importance and share of VET-based workplace learning it is crucial to study the perspective of those who are the main targets of learning at work and who bring their learning to workplaces – namely vocational students.

In sum, this study focuses on vocational students' successful on-the-job learning because workers with VET education are seen as a significant and large group of workers. Having finished their VET, individuals enter the job market as professional juniors at the early stages of their careers. Organizations and vocational institutions can ensure that novices master relevant and up-to-date professional skills on which to build their expertise by providing supportive workplace learning environments for students and nourishing student-related factors that contribute to learning.

1.3 Methodological choices

The starting point of this study is the on-the-job learning of vocational students and the main focus is to examine how their workplace learning can be enhanced by identifying factors that positively influence it. Students' workplace learning has previously been studied theoretically (Tynjälä, 2008) and the influence of factors related to workplace setting and/or individuals seen to enhance the students' on-the-job learning has often been studied from the perspective of higher education (Sykes & Dean, 2013) or by examining only a limited number of factors (Virtanen & Tynjälä, 2008). Furthermore, the literature has focused on adult (Fenwick, 2008) and employees' workplace learning (Amenumey & Lockwood, 2008), but there are very few studies examining a larger set of factors affecting vocational students' on-the-job learning (Virtanen et al., 2014).

The paucity of previous research on vocational students' successful on-the-job learning, taking into account various organization- and individual- related factors, calls for multimethod research. In the literature search, no previous studies examining a larger set of organization- and student-related factors enhancing the workplace learning of vocational students with various vocational and upper secondary qualifications, using multi-perspective and multimethod approaches, were found. The present study provides new knowledge about which organization- and student- related factors contribute to vocational students' successful development of professional skills during workplace learning. From a general standpoint, it was useful for this study to adopt a multimethod research approach by using quantitative and qualitative methods because it increased understanding (Proctor & Vu, 2007), provided a wider perspective on the phenomenon of the students' successful on-the-job learning, and allowed the researcher to approach the phenomenon studied as comprehensively as possible. In this study, quantitative research enabled examination of causal relationships between the factors studied and how factors enhancing workplace learning from vocational

students' perspective were related to workplace instructors' assessment of successful on-the-job learning and to formal grades. In turn, qualitative research made it possible to examine a single student's workplace learning period based on observations, discussions, and interviews in an authentic environment, and to compare the students' learning periods in order to examine the role of organization- and student-related factors in constructing a successful workplace learning period. In the present study, qualitative research provided more detailed and deeper knowledge about how the organization- and student- related factors found to positively affect workplace learning of vocational students in quantitative research manifested in authentic environments. Furthermore, it enabled the researcher to detect differences between highly successful and less successful students' workplace learning periods in terms of organization- and individual-related factors, strongly present in cases of highly successful students but not detected (or weakly represented) in those of less successful students. To conclude, quantitative research was useful in conducting a study including a large and versatile set of organization- and individual-related factors and examining their effect and mutual relationships on successful workplace learning of vocational students, whereas qualitative research provided deeper knowledge about these factors contributing to successful workplace learning period in an authentic environment. In sum, the multimethod design used in this study enabled the researcher to combine results based on statistical research and case studies in order to identify the key factors enhancing workplace learning of vocational students. Thus, the use of a multimethod approach helped to give a comprehensive answer to the main research question "How can the on-the-job learning of vocational students be enhanced?" through providing new knowledge about factors that would enable vocational institutions and organizations to reach this goal. These two approaches together provided deeper and richer knowledge about the topic of this study which would have been more difficult to gain by using quantitative or qualitative approaches alone.

The present study consists of five articles. The multimethod design adapted in the present study includes quantitative research (Articles 1, 2, and 3) and qualitative research (Articles 4 and 5). Article 1 examines how organization-related factors and factors related to the students' motivation, cognitive models, and attitudes impact their perceived development of professional skills during on-the-job learning by using statistical methods. Article 2 further examines the impact of organization-related factors on the development of profession-related skills from the students' perspective, because the effect of these factors was found to be strong in Article 1. Articles 1 and 2 are based on the responses of 285 graduating Finnish vocational

students. Article 3 studies how organization- and individual- related factors enhancing workplace learning from vocational students' perspective are related to workplace instructors' assessment of successful workplace learning and formal grading of demonstrated vocational skills. Article 3 is based on the same data as Articles 1 and 2, but it includes responses from 100 graduating vocational students and their workplace instructors. The number of responses was reduced compared to those of Articles 1 and 2 because Article 3 combined student responses with those received from each student's workplace instructor. Furthermore, the organization- and individual-related factors used in Article 3 are based on the results of Article 1. Article 4 builds a structured process of the vocational students' on-the-job learning period based on data collected from 20 Finnish vocational students and 14 workplace instructors. Article 5 is based on the same data as Article 4 and focuses on examining contributors to the students' successful on-the-job learning period.

Articles 1 and 2 specifically examine causal relationships and propose hypotheses concerning the impact of various organization- and individual-related factors on the students' on-the-job learning of professional skills, tested with the help of statistical methods. Article 3 continues by studying how organization- and individual-related factors enhancing workplace learning from the vocational students' perspective are related to workplace instructors' assessment of successful on-the-job learning and to the formal grading of vocational skills demonstration measuring how well students have learned skills required by their future profession. The type of analysis used in the quantitative research of this study is based on theoretically justified variables and correlations between them (Onwuegbuzie et al., 2009). Articles 1, 2, and 3 are representative of the positivistic paradigm. According to the positivist view, it is possible to generalize results that are free from values and culture (Wilber & Wisman, 1975). Furthermore, knowledge is assumed to be objective (Smyth & Morris, 2007). Positivism assumes that there is one common reality that the researcher can describe accurately and explain causally (Bisman, 2010). In these three articles, the data were collected from individuals and related to a larger community (Ghauri & Grønhaug, 2002) of vocational students (and workplace instructors and formal grades in Article 3). The studies are based on validated measurements used in the literature, and the data analysis involves statistical methods.

The qualitative research in this study is based on constructivist ontology and epistemology in the sense that it assumes that people construct and understand reality from different starting points and hence, conceptually describe reality in various ways. In short, there is no single or right way to describe the world; it depends on an individual's perceptions and conceptualization. In this study, qualitative research helps to

contextualize the phenomenon of the vocational students' successful on-the-job learning because it enables the study to examine it in its authentic environment. The qualitative research helps to create a deeper understanding of factors that enhance the students' on-the-job learning by cyclically analyzing the research material through different classifications of the data.

Qualitative data are in general based on observations and interviews in a natural setting and the researcher is assumed to affect the analysis of the data (Ghauri & Grønhaug, 2002). This type of research represents the naturalistic paradigm. Its goal is to understand the research object from the viewpoint of those who are observed and interviewed. Articles 4 and 5 adopt an inductive approach because they examine the phenomenon in a multifaceted and detailed way by using rich data. The results are based on naturalistic methods such as semi-structured interviews and observations which are closely related to people and thus in line with the naturalistic paradigm. The methodology in Articles 4 and 5 is hermeneutical in the sense that its goal is to understand and interpret the individuals' action in a specific context.

1.4 Research setting

As stated above, this study focuses on vocational students' on-the-job learning because it is a crucial phase on the road towards professional competence (Collin & Tynjälä, 2003). Specifically, it concentrates on contributors of such learning in the context of Finnish vocational education and training during the students' final on-the-job learning period, that is, when they are about to enter their careers. Due to the main focus of the present study, it is important to discuss *VET* systems in general and especially the Finnish one. This section explains the procedure of *vocational students' on-the-job learning in the Finnish VET system* because it is the framework of research in this study. Furthermore, because students' workplace learning occurs in organizations, it is necessary to understand the concept of *workplaces as learning environments* (Cheetham & Chivers, 2001). The general concepts of on-the-job learning are discussed in chapter 2.

The research setting described in more detail below implies some limitations. It is not possible to make straightforward generalizations of the results of this study directly to employees' workplace learning, whether of experienced workers or novices, because the Finnish VET-based regulated, goal-oriented, and guided workplace learning system creates a setting that differs from that of the actual hired workforce. Furthermore, the results cannot be generalized as such across countries because there might be substantial differences in organizing VET-based workplace learning between countries; however, the results provide directional

knowledge for vocational institutions, organizations, and policy makers in different countries about factors promoting workplace learning of vocational students and how these factors can be used in order to enhance their workplace learning.

VET

Many developed countries strongly encourage higher education (Alvesson, 2004), but there is a long history of VET specifically in European countries, too. Despite the different VET systems and practices in different countries (Brockmann et al., 2008) the general insight is that employees with a VET background perform practical, non-academic tasks at the root level. Specifically, employees with a VET background are seen to perform practical tasks that are non-academic and tightly related to a specific profession (Davies & Ryan, 2011). In general, these people are not low-skilled workers, but need specific skills and experience in order to manage their jobs. Hence, individuals without proper education and experience cannot instantly replace these professionals. As an example, it is not plausible for an electric company to hire electricians without appropriate education or for an entrepreneur in the hair salon business to employ someone without vocational skills and sufficient evidence of these skills, excluding the obvious case of apprenticeship contracts. In sum, employees with a VET background are not highly-educated academic professionals or experts, but they are not low-skilled workers either.

The academic world has traditionally not been interested in research on VET (Meer, 2007): VET has been considered old-fashioned and secondary to academic skills. It has been seen as an alternative for people with poor academic abilities. Furthermore, there have been stereotyped ideas of VET as an ineffective form of education, producing a workforce for disappearing low-skill jobs (Meer, 2007). However, the attractiveness of VET has increased and it even appeals to students with excellent grades. According to the Official Statistics of Finland, *41% of the graduates from Finnish compulsory education continued studies in upper secondary vocational education in 2010*.

There are signs that the research interest in VET may be increasing (Oketch, 2007). For example, the new interest in educational policy in different countries has increased interest in VET (McGrath, 2012). In education and training policy within the EU, VET is considered to have a key role in securing the EU's economic competitiveness (Brockmann et al., 2008). Furthermore, Toner (2010) found a relationship between vocationally-trained workers, the VET system, and technical innovation. He argued that both the

innovation and knowledge economy literature have emphasized highly-educated workers and ignored the employees who work directly with production. According to Toner (2010), repeated learning by doing improves production processes, service, and performance. Workplace learning enables knowledge creation through workers' experimentation. Hence, the VET workforce is not merely participating in production but has an impact on R&D due to its special practical skills, knowledge, and problem-solving abilities (Toner, 2010: 80). In sum, organizations would benefit from paying attention to developing a new skilled workforce through VET.

The Finnish VET system considered in the present study involves three years of full-time studies. It includes eight fields: 1) Humanities and Education, 2) Culture, 3) Social Sciences, Business and Administration, 4) Natural Sciences, 5) Technology, Communications, and Transport, 6) Natural Resources and the Environment, 7) Social Services, Health and Sports, and 8) Tourism, Catering and Domestic Services. The largest fields at the moment are Technology and Transport, Business and Administration, and Health and Social Services (Ministry of Education and Culture accessed 31 October 2014. The goal of the Finnish VET is to ensure that the students have appropriate skills, knowledge, and competence required by working life, and furthermore, to provide them with lifelong learning skills and the capability for continuous self-development (Finnish National Board of Education, 2010). The Finnish VET is based on vocational qualifications designed together with working professionals in order to enhance the students' employment after their studies as well as enhancing their abilities to develop themselves according to changing requirements when employed (Finnish Board of Education, 2010). At the moment there are over 100 study programs and more than 50 vocational qualifications for young people to choose.

Vocational students' on-the-job learning in the Finnish VET system

Students' on-the-job learning during VET studies is a wide-spread procedure. However, there are different ways to realize the vocational students' learning at work in practice (Cedefop, 2012) depending on different VET systems and policies across countries. Despite these differences, many education and policy makers consider VET-based on-the-job learning an important means of acquire professional skills required for contemporary occupations. In Finland the vocational students' on-the-job learning became mandatory in connection with the reformation of vocational qualifications between 1999 and 2001. The main motivation for introducing students' on-the-job learning was to better be able to meet the firms' requirements regarding

competent workers and to provide the students with lifelong learning skills. Being a formal part of the VET studies means that all study benefits, social services, and the students' insurance are valid during the students' on-the-job learning periods.

Finnish vocational institutions are responsible for arranging the students' on-the-job learning; for example, they are charged with making firm- and student-specific contracts with on-the-job learning firms and training workplace instructors. This responsibility does not exclude cooperation between schools, firms, and students. In fact, the Finnish system requires that a school, an organization, and a student together plan, realize, and assess the student's on-the-job learning period. The school is responsible for nominating teachers who are responsible for the students' on-the-job learning. This includes, for example, helping students to find an appropriate on-the-job learning firm, visiting the firm during the on-the-job learning period and staying in contact with firms. Firms must appoint workplace instructors who have the main responsibility for guiding the students and contacting the school if needed.

The Finnish vocational students' on-the-job learning covers at least one-sixth of the total study period, is spread over the entire three years. In practice, it is concentrated in the second and third years, because for many vocational qualifications the first-year students are not considered to have sufficient skills for on-the-job learning. An on-the-job learning period typically takes eight weeks and occurs in firms that correspond to the field studied. The student learns a part of the professional skills included in the vocational upper-secondary qualification studied and defined by the national core curriculum during workplace learning. The Finnish VET system also includes mandatory vocational skills demonstrations with formal assessments, introduced in 2006. These demonstrations are given at the end of an on-the-job learning period and assessed together with the student, workplace instructor, and teacher. Assessment criteria for the demonstration are defined in the Finnish VET qualification requirements. During the vocational skills demonstration the student shows, by doing practical tasks typical to the profession studied, how well he/she has acquired skills required by the national core curriculum and the profession. The students usually give the demonstration at the end of their on-the-job learning period, though not every workplace learning period ends with the demonstration.

Workplace learning setting

Workplace learning is seen as crucial for learning a wide range of skills, for example, profession-related and interpersonal skills needed in modern organizations characterized by constant changes (Clarke, 2005). Thus, identifying characteristics of workplace learning environments facilitating this type of skills learning has become important. The workplace as a learning environment (Coetzer, 2007) and the workplace learning setting are sometimes used as synonyms in studies examining factors that enhance workplace learning. This study uses the concept of *workplace learning setting,* which includes various contextual factors seen to enhance employees'/students' learning at work (discussed more detailed in Chapter 2). The concept of workplace learning setting is still evolving. It is often defined in terms of factors that facilitate or hinder learning at work (Tynjälä, 2008; De Vries & Lukosch, 2009). A traditional approach in the literature is to study effective workplace learning environments through individuals' participation in learning through work, supervisor activities, and feedback and assessment regarding learning (Trede et al., 2013). Specifically, some studies suggest that organizational support regarding workplace learning activities, providing supervisor support and job characteristics in the forms of new, challenging, and complex tasks, form a supportive workplace learning environment (Choi & Jacobs, 2011). Others are based on the idea that workplaces as learning environments can be categorized as expansive or restrictive (Fuller et al., 2007). Because workplace learning has become an important means for firms to survive, enabling them to be quick learners and adapters in changing situations, the managers' traditional role has evolved towards workplace learning facilitator or employee mentor (Coetzer, 2007). In general, workplace learning setting provides individuals an environment where they can learn new and up-to-date professional skills. Dimensions of workplace learning setting discussed in previous studies include interaction between experienced workers and novices, and individual participation (Filliettaz, 2013), knowledge transfer (Nieuwenhuis & van Woerkom, 2007), and physical and material dimensions in terms of tools and equipment.

This study adopts a definition of workplaces as learning environments according to which they 1) offer structured and goal-oriented learning experiences, 2) include planned and intentional work-related activities and interactions, and 3) are able to shape the employees' learning (Billett, 2004). These three points match well with the Finnish vocational students' curriculum-based on-the-job learning periods examined in this study because they are structured with planned goals, tasks, and work processes that the students must learn to master, and provide professional skills needed in the students' future professions. This study

examines workplace learning setting from the vocational students' point of view and considers individual-, organization-, and prior knowledge-related factors considered important for successful on-the-job learning in these settings. The factors and theories concerning individual learning in general are not examined in this study but are introduced as a framework in order to understand how on-the-job learning occurs from the viewpoint of learning theories.

1.5 Outline

This dissertation is divided into two parts: an overview of the dissertation and the separate articles. Table 1 presents the outline of the study with the articles and the research questions. The overall goal of this dissertation is to examine organization- and individual-related factors contributing to the vocational students' successful on-the-job learning. Chapter 2 lays out the theoretical and conceptual framework of the study. In Chapter 3, the research methodology and methods are explained in detail. Chapter 4 gives the background, objective, results, and contribution of each article. Finally, Chapter 5 summarizes the key results of the study.

Table 1. The outline of the study with the research questions

PART I: Introduction Main research question: *How can on-the-job learning of vocational students be enhanced?*	
PART II: Articles	
Article	Sub-questions
Article 1. Vocational students' perspective on professional skills workplace learning Article 2. Vocational students' perspective on organizational factors enhancing workplace learning	1. What are the factors that, from a student perspective, positively influence vocational students' on-the-job learning?
Article 3. Vocational students' workplace learning: A multilevel analysis of survey data from students, workplace instructors, and grade	2. How the relationship between the factors that vocational students consider to enhance on-the-job learning and assessments from workplace instructors differs from the relationship between these factors and formal grade?
Article 4. How are professional skills acquired?: A structured process of on-the-job learning Article 5. Exploring the contributors of successful development of professional skills during workplace learning periods	3. What factors differentiate the on-the-job learning period of highly successful students from less successful ones?

2. THEORETICAL AND CONCEPTUAL FRAMEWORK OF THE STUDY

This chapter outlines the theoretical and conceptual framework of the study, which focuses mainly on examining factors that contribute to successful development of vocational students' professional skills. The first section provides a theoretical background and a definition of the concept of on-the-job learning. The second section handles the established learning concepts of individual learning, contextual learning (connects individuals' learning to authentic environments), and experiential learning (relates individuals' learning to learning through experiences), and highlights the key aspects of these learning theories in order to understand how on-the-job learning occurs and to emphasize its nature as a learning method. The third section provides a theoretical framework of elements that are suggested to affect individuals' on-the-job

learning: the factors related to the individuals' motivation, cognitive models, and attitudes to the workplace learning setting that enhances learning. Figure 1 presents the theoretical and conceptual framework of the study.

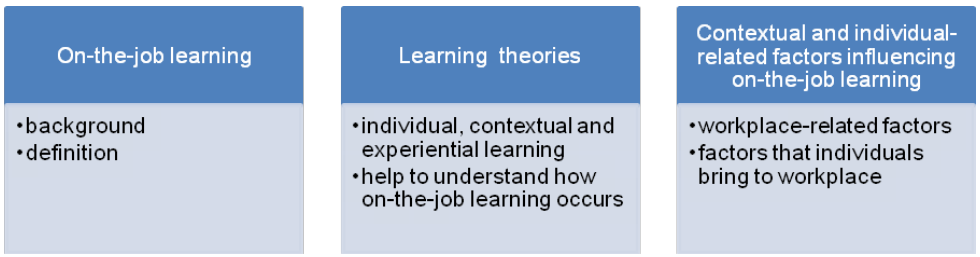

Figure 1: The theoretical and conceptual framework

2.1 On-the-job learning

Interest in on-the-job learning is increasing because it provides a flexible learning environment when professions and work are constantly changing, requiring new perspectives on profession-related skills learning (Harteis & Billett, 2008; Li et al., 2009). Workplace learning is a means to obtain relevant knowledge, taking into account future considerations in the complex modern operational environment of organizations (Collin & Tynjälä, 2003; Ley et al., 2008). Sauter (1999) aptly noticed a need for new and varied skills and pressures to combine different tasks. Organizations are seen to benefit from on-the-job learning because organizational learning is affected by competent workers, effective knowledge transfer between individuals, and coordinated activities (Reagans et al. 2005). Furthermore, workplace learning helps firms to survive increased inter-organizational competition and changes (Matthews, 1999) and provides a basis for novices' development in professionalism (Collin & Tynjälä, 2003).

There are several synonymous concepts for on-the-job learning, such as workplace learning, action learning, learning by action, learning by doing, work-related learning, work-integrated learning, work-based learning, on-the-job training, and practice-based learning (Sauter, 1999). The concept of on-the-job learning sometimes refers to the juniors' learning whereas on-the-job training refers to adult learning. However, the literature typically discusses these two and other concepts without making a distinction between adults and juniors.

On-the-job learning is seen, for example, to be related to 1) employees, in terms of task-related knowledge building and sharing between employees (Littlejohn et al., 2011) and as a tool for professional development needed due to changes in professional requirements and workplace environments (Harteis & Billett, 2008), 2) adults, through learning requiring personalized learning objectives in order to result in lifelong learning (Pavlis Korres & García-Barriocanal, 2008), a concept consisting of adult learning theory, earning paradigms, organizational needs, and individual interests (Matthews, 1999), and adult learning and development (Karakowsky & McBey, 1999), 3) students, by providing a learning environment for them (Virolainen, 2007; Virtanen & Tynjälä, 2008), 4) learning that is driven mostly by informal learning or any learning that occurs outside classrooms (Li et al., 2009) and is spontaneous and unintentional (Berings et al., 2006), 5) activities directed to promoting organizational effectiveness (Scheeres et al., 2010), and 6) activities that should be examined through activity theory and expansive learning theory (Engeström & Kerosuo, 2007). One common factor, however, combines most ideas of workplace learning: knowledge creation requires the participation of both individuals and workplaces.

There are several approaches to the study of on-the-job learning. A traditional way is to divide approaches into four categories: human capital theory, experience-based learning, cognition and expertise, and generic skills, capabilities and competence (Garrick, 1999). Human capital theory is about preparing workers to face the contemporary requirements of employers. Experience-based learning is the most commonly used theory in adult learning and on-the-job learning in general. Specifically, this approach stresses that effective learning requires an individual's emotional engagement in the learning process in the sense that an individual feels learning to be meaningful for him/her self. A starting point to the cognition and expertise approach is cognitive psychology, providing a tool for understanding an individual's knowledge and representations of his/her memory related to cognitive actions such as solving problems and learning. According to this viewpoint, ability to solve complex problems differs between experts and novices. The generic skills, capabilities, and competence approach emphasizes generic skills such as reading, ability to engage in higher-order cognitive thinking, and interpersonal skills that an employee needs in order to master further or special skills of his/her profession. Each of the above approaches represents a specific viewpoint towards on-the-job learning. The present study has adopted approaches to workplace learning that are predominantly related to human capital theory and experience-based learning.

This study defines on-the-job learning as the process of learning profession-related skills by doing daily tasks and solving problems in constantly-changing authentic situations (Felstead et al., 2010). More specifically, it is characterized as learning from experience (Kolb, 1984), with profession-related knowledge building and sharing between employees that is related to daily work tasks (Dymock & Gerber, 2002; Lans et al., 2008; Littlejohn et al., 2011). Despite the generally accepted beneficial effects of on-the-job learning for organizations and individuals, the literature has discussed some risks. For example, there may be a risk that economic policies are implemented to produce learning solely for the purposes of organizations (O'Donoghue & Maguire, 2005). Then, lifelong learning will be identical to learning skills and competences that firms need. This type of learning is not necessarily deep learning and its benefits for individuals and organizations are questionable. Furthermore, constant learning demands at work may result in employee stress and decreased commitment to work, which hurts not only the workers but also the customers and, eventually, the entire organization (Järvensivu & Koski, 2012).

On-the-job learning is considered particularly important for the students because it is seen as necessary for professional development (Collin & Tynjälä, 2003), whereas classroom learning is seen as necessary to construct technical skills (Dymock & Gerber, 2002). The Finnish VET includes theoretical studies and obligatory on-the-job learning periods. The school-based learning occurs in classrooms, training kitchens, or training workshops. The curriculum-based on-the-job learning takes place at workplaces, in authentic environments.

With respect to the Finnish vocational students' learning of professional skills at work (how they learn) it has been suggested that their on-the-job learning is characterized by formal and informal learning, experiences and experiential learning, context-bound learning, and working independently and with others (Virtanen et al., 2009). Furthermore, it has been argued that the knowledge acquired through schools or courses does not necessarily meet the requirements of the knowledge needed at work (De Vries & Lukosch, 2009). In addition, workplace learning is needed because there are skills that cannot be learned at schools; for example, practical customer service and the use of the latest technology. This stresses the importance of workplaces as learning environments providing future employees up-to-date skills through on-the-job learning.

On-the-job learning provides an appropriate environment, sometimes the only plausible one, for learning professional skills (Sauter, 1999). In fact, Streeck (1989) predicted that in an increasingly competitive and changing environment there are crucial skills that workers can and must learn at the workplace. As Streeck (1989:99) stated: “Work skills, then, for motivational, cultural and cognitive reasons, seem to be best produced where they are used: at the workplace.” The fact that schools are not able to keep up with rapid working life changes by, for example, constantly renewing the technical devices and tools related to workshop teaching also speaks for the importance of the students’ on-the-job learning in order to acquire up-to-date skills. Furthermore, it has been suggested (Streeck, 1989) that besides the obvious function of learning profession-related skills, workplaces provide the students with an opportunity to learn other central work-related skills through socialization such as reliability and the ability to manage pressure. This is important because firms consider mastering the most basic rules of life at work to be necessary for their employees (Schoeff, 2009). The vocational students’ on-the-job learning provides an excellent opportunity to convey professional behavior and ethics from the seniors to students: “this is how we professionals behave towards employers, colleagues, customers, and other groups.”

Regarding the students’ curriculum-based on-the-job learning there are also some possible risks. On the one hand, there is a risk that schools will try to relieve pressures caused by diminishing financing and changes in the funding system by extending the students’ on-the-job learning without proper planning (for example, considering how extended on-the-job learning affects its goals and course content, seniors’ guidance, and teachers’ visits to workplaces). On the other hand, a tight economic situation may negatively influence firms’ abilities to provide authentic environments for the students’ on-the-job learning and meet the requirements and goals of the training.

On-the-job learning is often considered informal learning to separate it from formal classroom learning based on the curriculum and provided by teachers. According to this traditional viewpoint, workers learn in an environment that is not originally planned for learning, their learning is not intentional, and the process is unstructured (Eraut. 2004). However, this traditional idea has been criticized because it has been observed that on-the-job learning is actually structured and goal-oriented (Eraut, 2004). As discussed in section 1.4, the present study considers workplaces as learning environments that 1) provide structured and goal-oriented learning experiences, 2) provide planned and intentional work-related activities, and 3) shape individuals’ learning (Billett, 2004). These three categories can be related to organization-related factors

seen to enhance workplace learning, especially for students and novices. The first category includes sufficient supervision and guidance in order to effectively learn through work (Tynjälä, 2008). The second one includes providing the students/novices tasks and opportunities to learn, especially those intended to improve their learning of professional skills, because this type of learning requires practicing current skills and experiencing new situations at work (Aksu & Özdemir, 2005). The third one consists of learning from and with seniors because learning the tacit knowledge needed to become an expert requires interactions between the students/novices and contemporary professionals (Tynjälä, 2008).

Tracing the theoretical basis of on-the-job learning reveals that it has roots in established learning theories. For example, it is based on existing knowledge (constructivism), affected by the context (contextual learning), and based on experiences and interaction between the individuals and the environment (experiential learning). It includes learning 1) from individual experiences (individual learning) (Cheetham & Chivers, 2001a; 2001b; Kolb, 1984; Reagans et al., 2005), 2) through interaction with others (Billett, 2001, 2004; Cheetham & Chivers, 2001a; 2001b; Eraut, 2004; Kolb, 1984), and 3) through observing, listening, and participating (Eraut, 2004). Furthermore, the active role of the learner (cognitivism) is important for on-the-job learning (Cheetham & Chivers, 2001a; 2001b). The next section provides a short description of the key aspects of well-known learning theories, which may help to understand the theoretical basis of on-the-job learning as a learning method and how learning at work occurs from the theoretical viewpoint.

2.2 A brief learning theory overview

In contemporary highly-technological, economy-driven, and knowledge-based environments, individuals' ability to learn is a key success factor for organizations, implying that individual learning is dynamically intertwined with workplaces as learning environments (O'Donoghue & Maguire, 2005): Workplaces provide technology, access to information, and other devices, and workers use these elements to create relevant knowledge. This section briefly introduces the core ideas of the established individual learning theories of cognitive learning theory and constructivism. The section also considers contextual learning and experiential learning, which are based on some key elements of constructivism, providing a theoretical foundation for context and individual experiences important for on-the-job learning. Table 2 presents a summary of these learning theories.

Table 2. Key aspects of individual learning theories, contextual learning, and experiential learning

<table>
<tr><td colspan="2">Individual learning theories</td></tr>
<tr><td>Cognitive learning (Piaget, 1978; Vygotsky, 1979)

Key aspects:
- individuals are active in learning
- experiences are essential in the process of learning
- previous knowledge is a basis for further knowledge
- individuals interact with the environment
- knowledge is a product of new structures that are successive and under constant development</td><td>Constructivism (Delanty, 1997; Spender, 2006; Vermunt, 1998)

Key aspects:
- learning is an active and self-directed process
- new knowledge is constructed on previous knowledge
- individuals' construction of knowledge is based on experiences
- knowledge is a social construction
Radical constructivism (von Glasersfeld, 1995; Spender, 2006)
Key aspects:
- individuals own knowledge →
- all knowledge is personal and subjective
- knowledge is always contextual
- goal of cognition is viable knowledge in the subjectively-experienced world
- the importance of reflection is emphasized</td></tr>
<tr><td>Contextual learning (Ellinger & Cseh, 2007; Engeström et al., 1995; Leslie et al., 1998; Young, 2001)

Key aspects:
- individuals learn through contacts with different contexts
- knowledge spreads in social interaction
- the operational context affects individuals' workplace learning</td><td>Experiential learning
(Cheetham & Chivers, 2001a; 2001b; Kolb, 1984)

Key aspects:
- personal experience is a key factor in learning professional competence
- a continuous process of learning is based on experiences and on interaction between individuals and the environment
- knowledge is a transaction between objective and subjective experiences</td></tr>
</table>

2.2.1 Individual learning

The literature considers individual learning a theoretical starting point for on-the-job learning because all learning occurs at an individual level (Illeris, 2003) implying that it is important to understand how individuals learn and what makes this type of learning happen. An example of the close relationship between individual learning and on-the-job learning is when workers create new or improved working procedures through performing daily tasks (Chonko et al., 2003). There are three commonly-recognized individual learning theories: behaviorism, cognitive learning theory, and constructivism. The literature does not converge on one unanimous theory of individual learning, but a common feature for all of them is that they consider learning to occur through experiences that change an individual's knowledge or behavior. The next section discusses

behaviorism briefly in order to better understand the development of individual learning theories, even though the focus of the study is on cognitive learning and constructivism.

2.2.2 From behaviorism to cognitivism

Research on individual learning has a long history (Cheetham & Chivers, 2001a; 2001b). To begin with, behaviorism flourished between the 1900s and 1950s (Mayer, 1996). The key point in behaviorism is that learners are assumed to respond to a stimulus by showing a certain reaction. The behaviorist response and stimulus view of learning stems from research on the learning of laboratory animals (Mayer, 1996) with detailed learning goals and accurate and quantitative measures of learning. The role of the teacher is to reward or punish the learner according to his or her responses (Mayer, 1996). According to behaviorism, learning is repeating the behavior rewarded by the teacher, with the aim of developing good practice (Hand, 2006). Furthermore, learning is seen as a result of resources obtained from outside, not as an individual's mental processes (Boghossian, 2006). Hence, the learner is seen as a passive receiver of knowledge, whereas the teacher is responsible for changing the learner's behavior in order to reach the desired results. Behaviorism has been criticized because it ignores the individual's mental processes, stresses external behavior, and strives for objectivity.

The cognitive perspective on learning emphasizes the mental processes through which an individual constructs concepts, uses language and symbols, and makes use of knowledge or information in order to learn. An individual processes knowledge which promotes his/her thinking, which in turn is needed in comprehension and learning (Mayer, 1996). As an example of such a process, Cheetham and Chivers (2001a; 2001b) mentioned Vygotsky's concept of self-communication in the context of a problem-solving situation, where learners comment on their performance at the same time they are doing something. According to the cognitive learning perspective, learning is interaction between prior knowledge and new information, resulting in more advanced cognitive structures (Hand, 2006).

The often-cited theories of Vygotsky and Piaget provide a theoretical ground for individual learning. Vygotsky's (1979) theory of individual learning argued against behaviorists by emphasizing the importance of developmental change in the context of learning. According to him, this development is not linear but evolutionary and revolutionary. Individuals are assumed to be active and able to affect their existence (Vygostky, 1979). The key factor in such a learning process is experience, because it both produces and

transforms concepts. Vygotsky (1979) considered previous knowledge, as a basis for further knowledge, an important element in the learning process. Furthermore, social interaction is considered vital for learning (Vygotsky, 1979): an individual is assumed to be in constant interaction with the environment during his/her process of learning. Vygotsky described an individual's adaptation to the social and physical environment by suggesting that the process of learning is not smooth but may include tensions and conflicts. In order to be meaningful for the individual, learning must be more than automation—it must be "relevant to life" (Vygotsky, 1979: 117–118). Piaget (1978) argued that knowledge cannot be constructed through experience alone or seen as a product of an individual's biological characteristics. According to Piaget (1978), knowledge is a product of new structures that are successive and under constant development. Hence, individuals are assumed to be active participants in the learning process. Many subsequent studies of constructivist learning are based on Vygotsky's and Piaget's ideas (Sutherland, 1999).

2.2.3 Constructivism

The predominating contemporary learning theory is constructivism, which sees learning as an individual process where new knowledge is constructed on previous knowledge (existing knowledge is a surface to which new knowledge attaches) and the learner independently acquires knowledge by actively seeking meaning for his/her subjective experiences. Hence, learning is a developing continuum, not pieces of separate knowledge and experiences (Vermunt, 1998). Constructivist theories argue against the idea of objective knowledge (behaviorism) that can be communicated through language (Von Glasersfeld, 1989). Instead, knowledge is seen as conceptual constructs that should be viable for the individual in his/her context of subjective experiences.

Constructivism includes various trends such as cognitive, radical, and social constructivism (Boghossian, 2006) but in the literature it is often discussed as a single individual learning theory. In short, cognitive constructivism stems directly from Piaget's ideas stressing that knowledge cannot be transferred to individuals; rather, individuals have to construct their own knowledge (Powell & Kalina, 2009: 242). Radical constructivism assumes that knowledge is always contextual and cannot be separated from the individual (Uden et al., 2001). Social constructivism emphasizes the learners' social interactions and critical thinking processes (Powell & Kalina, 2009: 243). This section discusses radical constructivism in more detail because

it assumes that all knowledge is personal and subjective (a connection to individual learning) and knowledge is always contextual (related to learning at work).

A trend of constructivism, radical constructivism assumes that knowledge is always owned by the individual and is always contextual (Uden et al., 2001; von Glasersfeld, 1995). Different definitions of knowledge are not supposed to affect this point of view. Instead of the passive reception of knowledge, radical constructivism requires the active construction of knowledge: Knowledge is a result of a construction process where new knowledge is constructed and attached to existing knowledge. According to radical constructivism, cognition strives for viable knowledge in a world the individual experiences subjectively. The knowledge stems from the individual's own experiences (von Glasersfeld, 1995) and experiences are seen as subjectively reflecting the world that the individual is living in from his/her own perspective. In other words, it is suggested that individuals experience the same conditions in different ways. From the perspective of teaching, radical constructivism is learning how to learn, not transferring knowledge mechanically from a teacher to a learner.

Radical constructivism considers the concept of reflection important, although it is suggested that an original experience cannot be equated with reflection (Von Glasersfeld, 1995). The process of reflecting experiences is always different from the very experience: experience is unique, and it cannot be repeated exactly in the same way. Hence, to reflect is to represent experiences. Representations are always restricted to the individual's own experiences. As a consequence, similar situations are likely to be experienced differently. Each reflection or representation is subjective. Hence, to communicate over representations is to communicate on the basis of one's own experiences that are not necessarily the same among individuals. In the same way, the individual is able to produce presentations about future situations, based on his or her present experiences and knowledge (Von Glasersfeld, 1995). Furthermore, radical constructivism recognizes that there might be a discrepancy between the individual's subjective constructions of knowledge and the knowledge needed in practice (Spender, 2006). In other words, the ideas we have in our heads are not necessarily in line with the practical requirements of the world around us. An advantage of radical constructivism is that it gives space for unexpected situations when acquiring new knowledge, which is useful in the context of on-the-job learning occurring in constantly-changing authentic situations.

2.2.4 Contextual learning

Contextual learning is a learning concept that has recently gained interest in addition to traditional concepts of learning such as experiential learning, especially when discussing workplace learning. According to the contextual learning concept, an individual's learning always happens in some context; it emphasizes the concrete learning situation which is seen to guide learning. A learning context includes an environment where an individual gains learning experiences and faces different situations in that environment. The main point in contextual learning is that learning should occur in a context where acquired knowledge is meant to be used, and learning occurs through interaction between the individual learning process and context. The contextual learning concept stems from the constructivist approach to learning in the sense that it requires a learning process that is meaningful from the learner's perspective in terms o his/her experiences. Individuals are seen to construct this meaning by interacting with and interpreting their learning environment (Putnam & Borko, 2000). It is encouraged to choose a learning environment that provides multiple experiences in order to best achieve the desired learning results. From a contextual learning viewpoint, the individual constructs knowledge and this knowledge is based on authentic situations. The literature has increasingly advocated contextual learning. For example, Young (2001) questioned the traditional individual learning literature that sees individual learning as learning without connections to any contexts and argued that learning is contextual. Furthermore, Ellinger and Cseh (2007) found that the employees facilitate the learning of their fellow employees and contextual factors, such as the managements' support and commitment of the organization to learning, affect learning at work. There is evidence that the individuals' operational context, including the organizational culture, industry factors (competitiveness), and company factors (incentives, promotion criteria, and job security), affects workplace learning (Leslie et al., 1998).

2.2.5 Experiential learning

Experiential learning is considered a key factor in learning professional competence (Cheetham & Chivers, 2001a; 2001b), and it is a well-established concept of learning. It provides a theoretical framework for on-the-job learning because it considers learning to be based on experiences and on interaction between the individual and the learning environment. For example, Dymock and Gerber (2002) found that the vocational students' workplace learning of professional skills is a form of learning from experience. The students create knowledge through interaction with the senior professionals. Experiential learning is often used to model

learning that occurs outside the curriculum. In Kolb's (1984) well-known model, experiential learning is seen as a continuous process, based on experiences, interaction between individuals, and the surrounding environment, that creates knowledge (Cheetham & Chivers, 2001a; 2001b). Kolb (1984) suggested that the efficient adaptation of new knowledge or skills involves four phases: concrete experience (personal experiences, feelings, and creative orientation), reflective observation (reflection of experiences and situations), abstraction (systematic thinking and problem solving), and active experimentation (practical activities, affecting other individuals or different situations). The individual is assumed to enter new situations consciously and with an open mind. In Kolb's (1984) model, the individual reflects and observes experiences from different angles, creates concepts, and integrates observations into logical theories.

The process of learning in Kolb's (1984) model includes tensions and conflicts, because the acquisition of new knowledge, skills, or attitudes does not shift smoothly through the phases of concrete experience, reflective observing, abstraction, and active experimentation, but learning occurs through conflicts between these phases. The key point is that learning requires more than the mere perception of or transformation of experience. During the experiential learning process, the individual moves within two dimensions. The extremes of the first dimension are experience and abstraction, and the extremes of the second dimension are active experimentation and observing. According to Kolb (1984), experiencing is considered both subjective (internal experience) and objective (environment-related). Knowledge is assumed to be a transaction between objective and subjective experiences.

Literature has criticized Kolb's (1984) model and studies of experiential learning in general because they concentrate on the reflection of experiences without discussing the essence of experiences (Eraut, 2004). Experiential learning theories generally consider experience a separate episode constituted through elaborated reflections in the agent's mind. In contrast, it has been suggested that there are several experiences or episodes through which learning accumulates and the experiences have meaning when the individual becomes conscious of them through concentration (Eraut, 2004).

2.3 Contextual and individual-related factors influencing on-the-job learning

Literature provides a wide range of contextual factors suggested to influence on-the-job learning. Generally, contextual factors are environmental factors referring, in this study, to on-the-job learning conditions that

firms provide to employees or students. In workplace learning literature, environments supporting workplace learning have risen to a key position (Garrick, 1999): What elements make up the kind of supportive workplace learning environment required for learning of profession-related skills and knowledge? When learning is an inseparable part of workplaces, it is crucial to identify factors that individuals consider to enhance their on-the-job learning. In short, on-the-job learning cannot be effective without a supportive environment. Due to lack of a unanimous definition of on-the-job learning, there are several studies suggesting a large number of factors which affect it (Clarke, 2005). The literature mostly examines factors influencing adults' (Karakowsky & McBay, 1999; Matthews, 1999; Pavlis et al., 2008) and professionals' (Littlejohn et al., 2011) on-the-job learning, whereas vocational students' viewpoints (Virolainen, 2007; Virtanen & Tynjälä, 2008) are less studied. Based on the wide range of literature, this section introduces a selection of contextual factors that may influence vocational students' successful on-the-job learning. Modern organizations need employees with learning abilities which connect the perspectives of individual and organizational learning in order to survive the constantly-changing operational environment and competition. In general, organizations have a substantial impact on their members' learning. In the case of students, the learning environment provided by on-the-job learning firms is emphasized because it directly affects their learning and the development of professional skills that are required from future employees.

In addition to the workplace learning setting provided by organizations, this section discusses individual-related factors such as cognitive, attitudinal, and motivational factors that the literature has suggested have an effect on workplace learning. In this study, motivational factors include self-efficacy, which is not widely used in studying factors influencing on-the-job learning of vocational students. However, recent literature has suggested that self-efficacy may improve workers' acquisition of appropriate knowledge in the constantly-changing work environment (Noe et al., 2013) typical of a modern workplace. Another aspect not commonly used in the context of on-the-job learning is work alienation/work ethics, referring to the individuals' work attitudes. Literature that approached on-the-job learning as a means to create meaningful work instead of focusing on promoting firms' productivity and competitiveness has emphasized the negative effects of work alienation on workplace learning (Brookfield & Holst, 2011). Furthermore, the aspects that work alienation/work ethic represent are seen as relevant for the present study because, according to the researcher's experiences, the vocational students differ regarding their attitudes towards work and the world of work. For example, there are students who are able to adjust and cope well in the on-the-job learning

situation, and other students whose work role is clearly not well grasped and who do not show enthusiasm towards the world of work. Figure 2 summarizes the contextual factors and factors related to individuals that are seen to influence on-the-job learning in this study.

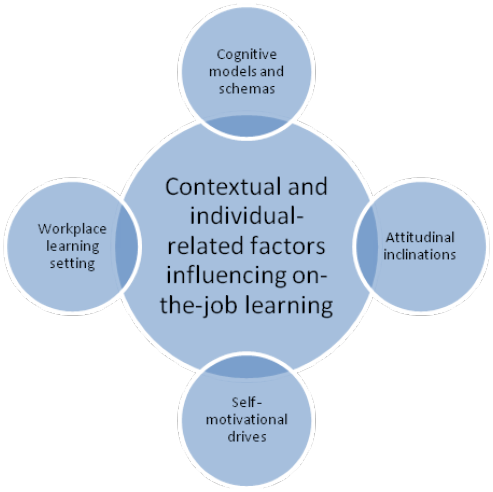

Figure 2. Contextual and individual-related factors influencing on-the-job learning

2.3.1 The workplace learning setting

Organizations provide a workplace learning setting where individual profession-related learning can be enhanced (Matthews, 1999). How organizations see and value learning is crucial for individual learning. Mumford (1992) recognized the power of organizations as learning environments in that they have a strong effect on an individual's learning or not learning. It is important for organizations to plan and direct work experiences appropriately in order to produce or encourage learning that is useful in a particular organization. The vocational students' on-the-job learning firms are in an important position because the students are highly dependent on the ability of organizations to fulfill their function as proper learning environments.

In general, organizational characteristics are considered crucial for workplace learning. For example, the literature has discussed three important characteristics that are suggested to enhance organizational members' learning based on Fuller and Unwin's expansive–restrictive continuum. Employees are given a chance 1) to participate in different communities of practice both at work and away from work, 2) to construct their knowledge and expertise with others, and 3) to acquire theoretical knowledge in off-the-job courses (Tynjälä, 2008).

Organizations vary from small and medium-sized firms to large national or international corporations, and hence workplace learning environments are different. However, there are factors common to organizations despite their size or sector that affect individual on-the-job learning, such as the role of managers and owners (Kelliher & Henderson, 2006; Confessore & Kops, 1998), effective communication (Amy, 2008), and the provision of sufficient resources for supervision and guidance (Billett, 2001; Hannah & Lester, 2009). Other contextual factors of workplace learning settings discussed in the literature are the managers' impact as motivators and supporters (Bryson et al., 2006; Confessore & Kops, 1998), the enabling of knowledge sharing and accessibility (Mumford, 1992; Lehesvirta, 2004), and an innovative climate and experimentation (Hurley, 2002; Laurillard, 1999). However, it is important to note that none of these is enough alone. Instead, they are intertwined and strengthen the effects of one another.

This study applied theories and research discussed primarily in the literature of adult learning to a new environment of vocational students' workplace learning that occurs while still studying for a future profession. The use of adult workplace learning literature as a starting point is justifiable because professional skills learning through work occurs in a certain workplace setting whether the learner is an employee or a vocational student. However, this study does not assume that factors enhancing the workplace learning of adults and vocational students are completely identical. For example, employees may have years of work experience or even expertise in their professional field, and workplace learning can function as a means to update their professional skills. Furthermore, the Finnish vocational students' on-the-job learning is an established procedure that for its part regulates the content, goals, and assessment of such learning. For these reasons, factors discussed in this section may appear differently from the perspectives of employees and vocational students. Work autonomy and managers' support may have different emphases for experienced professionals and vocational students, considering the importance of these factors in enhancing workplace learning of professional skills.

One of the most-discussed factors is *the managers' impact*. Managers are in a crucial position since they can affect and are responsible for many organization-related factors that influence on-the-job learning; for example, participation, motivating actions, and support. There is evidence that among many factors affecting on-the-job learning, such as the behavior of colleagues, management of problems, knowledge of the vision and mission, dealing with problems outside work, acting with solidarity, getting information and seeing the whole, taking responsibility, practicing things learned, and experiencing new things, the most important factor is the superiors' behavior in enabling dialogue between colleagues, encouraging teamwork, and providing training possibilities and rewards (Aksu & Özdemir, 2005). Furthermore, managers have a key role in motivating employees and making development possible (Bryson et al., 2006). Literature has suggested that knowledge sharing and support for learning at work depend on the managers' ability to comprehend the learning process (Lehesvirta, 2004) and management support is important for favorable learning conditions at work (Li et al., 2009). In addition, scholars have stressed that managers must be able to learn and facilitate learning because reluctance towards learning among the management produces reluctant learners among employees (Turner et al., 2006). Managers' positive attitude towards learning is important because literature has recognized possible negative effects on the employees' learning, in the sense that some managers may feel insecure and powerless if the employees are eager learners (Turner et al., 2006). The managers of the vocational students' on-the-job learning firms are not usually involved with the students' daily performance. Instead, the nominated workplace instructors who are responsible for the students' guidance have a crucial impact on their on-the-job learning and can be considered as superiors or supervisors for the students.

In order to enhance individual learning, make it meaningful, and relate it to the whole, the employees need to *understand the goals and values of the organization* (Aksu & Özdemir, 2005). Casey (2005:141) suggested that the managers and organizations can enhance individual learning by ensuring that the employees know "how things are done around here." In the context of students' successful workplace learning, it is required that all the agents involved (firms, teachers, and students) understand the curriculum-based goals of the on-the-job learning period and act upon them (Tynjälä, 2008). Related to understanding the overall goals to be achieved, it is important to recognize the meaning of seeing the entity more than the various components (Aksu & Özdemir, 2005; Virtanen & Tynjälä, 2008): Students/workers need to understand the whole process of different work entities and see how their work affects the work of others.

Enhancing the individual's actions within organizations and improving learning through it is discussed on many levels in the literature. In general, a well-functioning *communication system* increases the employees' learning possibilities. Different ways of communication affect individual learning and individual learning requires various types of information about the inevitable and continuous changes in the organization (Casey, 2005). Informal discussions during a coffee break or in the hallway and the formal acquisition of information (such as employee training through courses or seminars) are both important for effective on-the-job learning. Individuals can learn about the changing goals of the organization by acting and reflecting in small groups. Again, managers are in a crucial position to nourish such teamwork. A lack of communication is seen as the main obstacle for learning, whereas the creation of an open, relaxed, and easy-to-approach communication environment results in trust and thus enhances individual learning (Amy, 2008).

In the context of on-the-job learning, the students' *interaction with seniors* is important. Opportunities for social and informal interaction are seen as a central organizational factor enhancing individual learning. The social perspective of individual learning within organizations is important because social interaction is considered crucial for building professional knowledge (Simon, 1991). For example, informal discussions among employees and the feeling of being connected to the organization can enhance professional skills development. Connecting possibilities, referring to the opportunity to build internal and external connections with colleagues and other interest groups, are considered important for the individual learning process (Confessore & Kops, 1998). Furthermore, the literature has suggested that interactions with colleagues, the supervisor, and mentors are equally important for individual learning and there should be "helpers" such as the supervisor, mentors, or colleagues within the organization who can help others to learn (Mumford, 1992).

An effective infrastructure of communication and interactions is related to *knowledge sharing/transfer*. In this respect, informal channels of knowledge sharing, such as free conversations between workers, can be powerful (Lehesvirta, 2004) because they provide opportunities for individuals to learn new things besides functioning as important occasions for knowledge sharing. Knowledge transfer/sharing is a process which enables experiences of individuals or groups to affect one another in order to create knowledge (Argote et al., 2000) Furthermore, organizations can enhance individual learning by providing different forms of group work in order to promote knowledge exchange and shared expertise (Tynjälä, 2008: 135). In addition to group work, individuals learn at work by participating in different working practices and by colleague and

client collaboration (Tynjälä, 2008:150). Effective knowledge sharing is crucial when firms attempt to convey their present employees' professional skills to the juniors in order to get competent workers in the future.

The feeling of being a member of the organization and the experience of participating in it are organizational factors that the literature connects with individual workplace learning. For example, scholars have suggested that organizational values such as equality and solidarity affect learning (Aksu & Özdemir, 2005) and being allowed to participate at work is important for the individual learning of skills (Bryson et al., 2006). According to Tynjälä (2008) participation in different working practices enhances individual learning at work. To be treated as members of the work community is important for the students, as they stay with the on-the-job learning firms for relatively short periods and need experience in the performance of different tasks.

The literature suggests that *trust* enhances the individual's feeling of belonging to the work community and promotes his/her learning. Trust can be defined as an individual's willingness to take risk in terms of being vulnerable to another individual's actions (Mayer *et al.*, 1995). Seo (2003) suggested that individual learning requires the building of trust and friendship: organization members who trust each other are more willing to share knowledge (Bock et al., 2005). Similarly, when a student (or less experienced worker) feels that he/she can trust a senior (or more experienced worker), learning becomes more efficient (Dymock, 1999). In contrast, high levels of stress and threat have negative effects on the learning environment (Hurley, 2002). According to Amy (2008), organizations can create trust by constructing an open, relaxed, and easy-to-approach communication environment.

An innovative climate and risk-taking cannot be ignored in the context of individual on-the-job learning because overcoming challenges, experimentation, and learning from mistakes are significant factors that affect learning and create a successful learning environment for the members of the organization (Hurley, 2002). An innovative climate is an atmosphere that is shared by all members of an organization. An organization with an innovative climate typically values innovations, accepts risks and mistakes, and is able to manage risks (Hyland & Beckett, 2005). An innovative climate is often defined in terms an organization that tries to enhance employee creativity and innovativeness, resulting in new products or procedures and thus a competitive advantage. Among these characteristics are motivation for an organization to innovate by creating mechanisms that support development of novel ideas and effective knowledge transfer of information and ideas, provision of resources that help to achieve goals set for innovation, and management

practices that provide autonomy in doing tasks and positively challenging work (Amabile, 1996). In contrast, control and routine are considered harmful for learning and innovation (Hurley, 2002). In sum, organizations can improve workplace learning if they encourage risk-taking, experimenting, learning from failure, and proactive behavior. The managers' willingness to take risks and acceptance of failures as part of innovation is reflected in the employees' behavior (Jaworski & Kohli, 1993). It has been suggested that an organization which enhances learning is characterized by an innovative environment allowing trial and error, experimentation, and the collection of feedback (Laurillard, 1999). An innovative climate is important for students because it provides opportunities to explore new skills and work methods (Hannah & Lester, 2009) thus enhancing professional skills learning.

The ability of organizations to provide *tasks and learning opportunities that improve professional skills and development* is important for on-the-job learning because it requires practicing the newly learned things and experiencing new ones (Aksu & Özdemir, 2005). In addition, firms should enhance the acquisition of diversified competences and, at the same time, take into account changes and requirements in the future (O'Donoghue & Maguire, 2005). Organizations that provide variable, complex, and autonomous tasks for their employees are considered to be supportive of individual workplace learning (Kira & Frieling, 2007). Applying this to the context of this study, students should be provided with relevant tasks and work experience during their on-the-job learning period in order to develop their professional skills for the future needs of firms. In similar vein, O'Donoghue and Maguire (2005:443) argued: "Acquisition of the key competencies must begin early in the education life cycle." This highlights the importance of the approach chosen for the present study: examining the juniors' successful on-the-job learning while they are still studying.

In addition, the literature has attached job-related factors such as *job characteristics*, including job complexity and autonomy, to tasks and learning opportunities provided for employees who learn at work. Job characteristics such as task identity, task significance, and skill variety create conditions that promote effective job performance of individuals (Hackman & Oldham, 1976). Furthermore, there is evidence that characteristics related to job demand and control can enhance workplace learning (Raemdonck et al., 2014). Increased job complexity (for example, demanding tasks) can improve motivation if the initial tasks are monotonous, but it may slow down learning for those with little experience compared to those with previous experience (Nembhard & Osothsilp, 2002). The literature suggests that autonomy, including the absence of

strong routines, strict rules, and regulations, affect individual learning at work positively (Felstead et al., 2010; Hurley, 2002; Kim, 1993; Lehesvirta, 2004). Employee autonomy refers to the degree to which an employee is able to schedule his/her work independently and have a say in deciding about the procedures and equipments to be used (Sims et al., 1976). Autonomy measured through decision-making power over planning of one's work activities enhances learning opportunities and thus increases professional growth (Van Ruysseveldt et al., 2011). Virolainen (2007, p. 306) studied workplace learning in Finnish polytechnics and suggested that autonomy given to the student in the work community increases improvement of the student's existing skills and the development of new ones, thus increasing individual learning. Furthermore, previous literature suggests a positive relationship between learning opportunities and *job satisfaction* (Rowden & Clyde, 2005). In broad terms, job satisfaction is about the extent to which individuals are satisfied or dissatisfied with their work. More specifically, it is an individual attitude reflecting the extent to which a worker considers different aspects of his/her work, such as colleagues, supervisors, and working conditions, to benefit him/her (Diestel et al., 2014).

Basically, the students' on-the-job learning is *learning from and with others*, especially from and with the workplace instructors and other seniors. Besides providing a learning environment for their employees, many contemporary organizations function as learning environments for vocational and higher education students as well (Tynjälä, 2008). Learning the tacit dimensions of expertise in demanding skills requires interaction between the novices and experts (Tynjälä, 2008). Specifically, more experienced workers influence the novices' learning by providing so-called mastery experiences and vicarious learning (Hannah & Lester, 2009). Mastery experiences question the individual's present knowledge and thinking. Individuals face new working situations where existing knowledge or skills do not help. Vicarious learning, also called role modeling, means that the individual observes situations where colleagues handle mastery experiences successfully. The discussion above suggests that the workplace instructors' impact on students' on-the-job learning is important because they are responsible for guiding the students.

Supervision and guidance are required for effective on-the-job learning (Tynjälä, 2008) because in order to turn into concrete change in individual and organizational behavior, learning must be properly connected to the organization (Kelliher & Henderson, 2006), and sufficient resources and appropriate direction of the resources are needed for successful individual learning (Hannah & Lester, 2009). Guided learning strategies, including modeling and coaching, enhance learning through work (Billett, 2001). In general, students'

guidance during on-the-job learning is suggested to be affected by various factors such as the employees, experience of student guiding, willingness to commit to the students' learning, seniors' level of professionalism, and the current need for workers (Virolainen, 2007). It is considered important that the students are not dependent only on the appointed workplace instructor but receive guidance from other seniors in the workplace (Virolainen, 2007) in order to gain experiences from different work methods and tasks.

Feedback and *reflection* are considered crucial in deep learning of new skills (Hannah & Lester, 2009; Hurley, 2002; Mumford, 1992). There is evidence that giving feedback about progress promotes adult learning (Hurley, 2002) and managers' feedback regarding employees' job performance has a positive effect on learning (Hannah & Lester, 2009). Feedback is useful for juniors when it is properly planned together with all parties involved in on-the-job learning and is linked to learning goals (Pelgrim et al., 2012). Scholars have differentiated between the effect of positive and negative feedback on individual learning in the sense that positive feedback tends to enhance learning whereas negative feedback may lead to not learning (Turner et al., 2006). Here reflection is considered to occur between learners and supervisors (Hegarty et al., 2011), learners and peers or mentors (Sykes & Dean, 2013), or as a collective reflection (Walsh, 2009). Reflection on individual performance and activities is seen as a prerequisite for learning from experiences at work because knowledge is a result of actively seizing experiences and transforming them into relevant knowledge (Hegarty et al., 2011). Reflection related to workplace learning usually means that a worker analyzes his/her experiences from work in order to identify what he/she has learned from them (Walsh, 2009). Recent literature suggests that reflection during students' on-the-job learning should be focused on reflection that occurs at the same time a student is performing a task (Sykes & Dean, 2013) instead of reflection after finishing workplace activities. This type of reflection occurs through practice or action, challenging the traditional cognition view of reflection, and it is seen to fit well within the context of on-the-job learning (Sykes & Dean, 2013).

2.3.2 Motivation

In this study, students' successful on-the-job learning is related to the self-motivational drive provided by the students' goal orientation (Sujan et al., 1994) and work-related efficacy beliefs (Zimmerman, 1990). In the literature, self-motivation is defined as the individual's strength and persistency in goal setting and working to

achieve them (Cheng & Ickes, 2009; Zimmerman, 1990). Due to the focus of this dissertation, the discussion on individual-related motivational factors is restricted to the factors that are supposed to affect workplace learning. As discussed above, organizations have power to provide individuals an environment with learning opportunities and motivating challenges (Tynjälä, 2008). Another key impact concerning workplace learning is the individual who takes these opportunities in order to learn. The literature has suggested that the individual's engagement in workplace activities is among the factors that affect the quality of learning at work (Billett, 2001). Individual initiative related to learning is considered essential (Billett, 2004; O'Donoghue & Maguire, 2005). As an example, the impact of individual initiative in learning becomes important when organizations differ from each other. Some organizational environments favor learning more than others and so proactive individuals are able to learn even in less favorable conditions; adversely, less driven individuals are less likely to seize the learning opportunities provided by the organizational environment (Bryson et al., 2006). In this context, proactive behavior refers to the behavior of an individual who is active in searching information, starting situations, and creating possibilities for successful performance, that is, he/she has an active hold on work. In sum, the contemporary literature stresses the responsibility of the individual when discussing workplace learning (Billett, 2004; O'Donoghue & Maguire, 2005).

Successful workplace learning requires an appropriate goal orientation that an individual can adopt as a self-regulatory strategy in different achievement situations (VandeWalle et al., 2001). Goal orientation can be categorized as learning orientation and performance orientation. Goal orientation provides an approach to examine the motivational factors that influence workplace learning. Sujan et al. (1994) examined two goal orientations among salespeople: learning and performance orientation. According to them, the employees with a learning orientation tend to enhance their skills, thus increasing their mastery of given tasks. They enjoy challenging tasks and show initiative at work. The individuals with a performance orientation prefer being valued by significant others and receiving positive feedback from people that they consider important regarding their current competence. According to Sujan et al. (1994), a learning orientation denotes willingness to develop work-related knowledge and use it in authentic situations. The employees with a learning orientation are persistent and try again despite failures. In addition, they work hard. Performance orientation means that the employees concentrate on their efforts in the sense that they try to improve their job performance through devoted and hard work. It may be difficult for the students to master or even be

allowed to perform challenging tasks and demonstrate initiative in all authentic situations during on-the-job learning. Instead, they are dependent on their workplace instructors, their guidance, and feedback.

Self-efficacy is another individual-related motivational factor that affects on-the-job learning. Self-efficacy can be defined as an individual's belief in his/her capacity to accomplish a given task (Bandura 1986); that is, one feels confident about his/her own ability to master particular tasks and skills (Downey & Zeltmann, 2009). Self-efficacy beliefs affect and guide an individual's behavior through cognitive, emotional, and selective processes. Perceived self-efficacy is seen to have a significant impact on individuals because it influences how people think, feel, act, and motivate themselves. A high level of perceived self-efficacy enhances involvement, persistence in doing tasks, and performance, as well as psychological well-being. In contrast, individuals with low levels of self-efficacy are more likely to exert less effort, make more negative attributions, and perform less well. Individuals with high levels of self-efficacy consider difficult tasks as challenges that they want to learn to master, whereas those who are less confident about their abilities tend to avoid tasks seen as difficult. As self-efficacy can be related to an individual's positive view of him/herself, it is considered an important condition for successful on-the-job learning (Matthews, 1999). In fact, many studies suggest that self-efficacy, goal orientation, and motivational attitudes towards learning affect workplace learning (Choi & Jacobs, 2011). Many studies recognize the positive relationship between self-efficacy beliefs and work performance (Bandura, 1977; Chen et al., 2001; Gundlach et al., 2003; Schyns & von Collani, 2002): an individual's strong confidence in his/her ability to act according to required behavior (Bandura, 1977) influences positively his/her work performance. It has been suggested that self-efficacy improves the individual's ability to adjust to new environments including training, socialization, and changes in organizations (Chen et al., 2001). This is a relevant aspect for the current study because the students need a continuous ability to adjust themselves during on-the-job learning in order to learn new skills, apply skills in new situations, and cooperate with others. Furthermore, there is evidence of 1) a positive relationship between self-efficacy and learning motivation (Bryson et al., 2006), 2) self-efficacy promoting motivation to commit to informal workplace learning activities, defined as activities in which workers engage in order to develop professional knowledge and skills (Lohman, 2005), and 3) the positive effect of a high level of self-efficacy on effort in training and learning motivation (Strauss et al., 2009). Recent literature has also suggested that the relationship between self-efficacy and informal learning (defined as continuous acquisition of up-to-date profession-related knowledge and skills in organizations) requires further research

because there is some evidence of a positive effect of self-efficacy on informal learning (Noe et al., 2013). This connection is seen as important because self-efficacy may enhance individuals' proactive behavior in applying knowledge and skills in a constantly-changing work environment (Noe et al., 2013). These findings suggest that self-efficacy may have a direct positive effect on workplace learning.

2.3.3 Cognitive models

In terms of the students' cognitive predisposition for learning a profession in the context of the on-the-job learning period, prior knowledge of the field is considered important. Early theories by Ausubel (1960) and Vygotsky (1979) suggested that previous knowledge is important in the process of individual learning. It has even been suggested (Ausubel 1968) that what the learner already knows is the single most influencing factor determining subsequent learning. Prior knowledge has been related to on-the-job learning in the sense that workers or students enter a workplace with certain prior knowledge and skills which will affect their further working and learning at work (Hodkinson et al., 2004). Prior knowledge has a crucial impact on the learner's cognitive predisposition for learning new things. Constructivists and antecedent individual learning theorists have strongly advocated the importance of previous knowledge and have considered it a necessary base for the construction of new knowledge. In pure theoretical frameworks, the role of prior knowledge is clear and justified. However, more practical considerations have made previous knowledge a controversial subject.

Previous knowledge is a central concept in theories on individual learning, since it is seen as a basis for further knowledge creation. In general terms, prior knowledge is knowledge that facilitates the learner's construction of new knowledge. It includes existing concepts, experiences (Alexander et al., 1994; Dochy et al., 1999; Kendeou & van der Broek, 2007; Nembhard & Osothsilp, 2002; Seufert, 2003; Shapiro, 2004), and points of view (Biemans et al., 2001). Prior knowledge provides the map of schemes and the webs of concepts and discourses with which any new knowledge is interpreted, and to which it is connected. In that sense, prior knowledge can restrict and frame the development of new knowledge and learning. Prior knowledge may consist of formal learning (concepts and ideas), theoretical knowledge, personal experiences, and attitudes. A comprehensive review study by Dochy et al. (1999), revealed that 91.5 percent of the reviewed studies (n = 183) found positive effects of students' prior knowledge on their performance. In their review, prior knowledge was defined as "the whole of a person's actual knowledge that: a) is available

before a certain learning task, b) is structured in schemata, c) is declarative and procedural, d) is partly explicit and partly tacit, and e) is dynamic in nature and stored in the knowledge base" (Dochy et al., 1999: 145). A study by Shapiro (2004) suggested that domain prior knowledge, defined as formal knowledge of a field of study, and topic prior knowledge, referring to specialized knowledge in a certain field, both enhance students' learning outcomes. The influence of prior knowledge on individual learning in the context of workplace learning is also recognized. A study by Nembhard and Osothsilp (2002) suggested that workers with previous work experience in a certain field learn tasks related to that field faster when job complexity is increased than those with less experience. Hence, "prior expertise" (an individual's initial performance level) affects an individual's learning behavior. Tsai and Tsai (2005) found that nursing students possessing prior knowledge concerning clinical practice were more independent and self-directed than the students with no prior knowledge. There are also studies questioning the positive effect of prior knowledge on learning. A study by Wong et al. (2002) found that there was no direct effect of prior knowledge (a student's prior knowledge was measured through his/her previous mathematics knowledge in terms of scores on pretests and school marks) on the students' performance. Seufert (2003) claimed that instructional help is not useful and may even be harmful for the learners whose domain-specific prior knowledge is not sufficient.

The graduating vocational students enter their final on-the-job learning period with certain prior knowledge. The students of a specific vocational field have studied curriculum-based theoretical and practical courses; that is, core subjects and vocational and optional modules, and have completed previous compulsory on-the-job learning periods. The differences in the students' prior knowledge may stem from various sources, including how much effort the students put into their studies, their previous work experience excluding curriculum-based on-the-job learning, finished or unfinished previous studies, and attitudes. The diversity of prior knowledge means that it is difficult to measure. Furthermore, it is difficult or even impossible to cover all previous knowledge that the individual possesses. It is therefore required that the variables of prior knowledge used in research are reasonably measurable.

There is evidence of experimenter judgment and self-estimation being inaccurate measures of prior knowledge (Shapiro, 2004), because these measures tend to indicate that the impacts of prior knowledge on learning results are less significant. In contrast, many test formats provide more accuracy for measures of prior knowledge. It is important to recognize what type of prior knowledge is crucial for the research in question and what its nature is (Shapiro, 2004); furthermore, the aspects of quantity, quality, and breadth of

prior knowledge must be taken into account. In this dissertation, prior knowledge is operationalized as the vocational students' prior knowledge in terms of previous work experience in the studied field, performing typical tasks for the industry, and the length of work experience. This type of measure is based on the study by Alexander et al. (1994), in which prior knowledge is labeled as a domain or topic. Domain knowledge is general and topic knowledge is specialized. Usually a person possessing topic knowledge also possesses domain knowledge in a particular subject. However, it is possible to have specialized knowledge without a strong connection to the specific subject in general and vice versa (Alexander et al., 1994).

2.3.4 Attitudes

An attitude is "a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour" (Eagly & Chaiken, 1993), i.e., an evaluative response tendency towards an object. Attitudes exert a directive influence on behavior. It can be said that positive attitudes towards an object lead to behavior that supports the object, whereas negative attitudes predispose one to unfavorable behavior towards the object. Hence, a positive attitude towards work life would make exerting effort to manage well at work more likely, whereas a negative attitude would have the opposite impact. The present study explains the students' attitudes affecting the development of professional skills by examining their general attitudes towards work and professional life.

Work ethic is a commonly used concept expressing the importance of hard work in the individual's life through the intrinsic value of work and other values such as efficient use of time and serious commitment to work (Pogson et al., 2003; ter Bogt et al., 2005). People with a high work ethic value work itself, whereas rewards related to work are not determinative issues. It reflects one's work role identification but ignores the dimensions of enthusiasm and activation regarding work (Hirschfeld & Feild, 2000). The definition of work ethic presented above includes four commonly-used dimensions: hard work, non-leisure, independence, and asceticism (Blau & Ryan, 1997). Work ethic is seen as a general attitude towards work that is connected to performance (Blau & Ryan, 1997). It is independent of a specific workplace, tasks, age (ter Bogt et al., 2004), or the individual's status (Van Ness et al., 2010). Furthermore, the literature has demonstrated a relationship between work ethic and professionalism because professionalism reflects a certain lifestyle; for example, a professional is assumed to be deeply committed to work, thus indicating a high work ethic

(Parkan, 2008). By these definitions, work ethic seems to represent a holistic attitude towards work and to have a profound effect on the individual's life.

Another concept reflecting the individual's attitude towards work and work life is work alienation. It expresses overall disaffection regarding the work role, not just the contemporary job, and it affects the individual's performance in specific tasks (Hirschfeld, 2002). Work alienation is assumed to reflect an unenthusiastic attitude towards the world of work and to show that the individual is not engaged in the work role (Hirschfeld & Feild, 2000). In the case of the students' on-the-job learning, it is important to note that engagement in the work role is related to the level of activation (Hirschfeld & Feild, 2000) which can affect learning and the development of professional skills during on-the-job learning. Furthermore, work alienation is a plausible measure of the students' attitudes because 1) it expresses general attitudes towards work and work life, 2) it already exists before any on-the-job learning, 3) it affects learning motivation, and 4) even temporary workers can feel work alienation (Halbesleben & Clark, 2010).

3. RESEARCH METHODOLOGY

This study consists of five articles, each handling different perspectives related to the main research question: How can on-the-job learning of vocational students be enhanced? Articles 1, 2, and 3 are statistical studies, while Articles 4 and 5 are multiple-case studies (Figure 3).

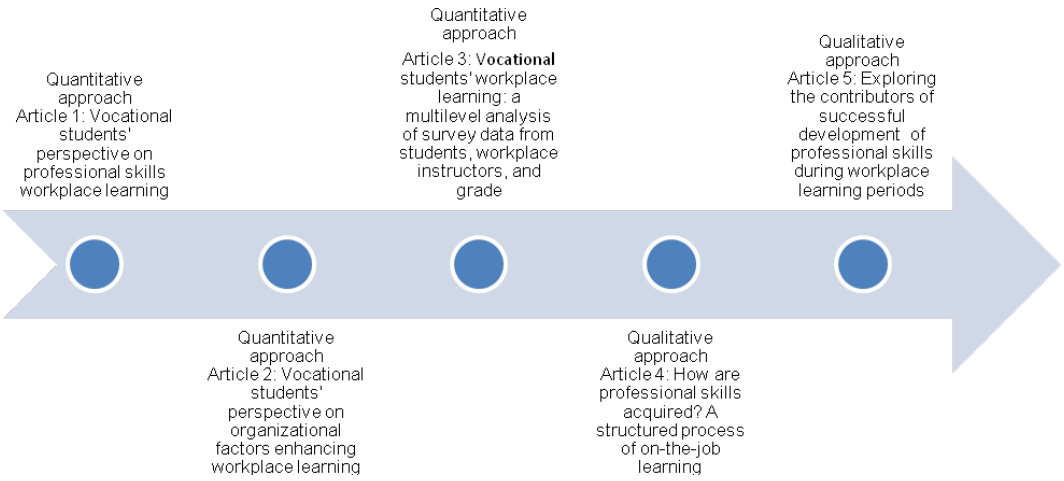

Figure 3. Articles of the dissertation

The research methodology applied in these articles includes both quantitative and qualitative methods (multimethod approach). The quantitative approach was adopted in Articles 1, 2, and 3, and the qualitative approach in Articles 4 and 5. Table 3 summarizes the research design of the study by presenting the role of separate articles, listing types of methods and analysis, and describing the data used in the articles.

Table 3. Research design

Article	Role	Method and analysis	Data
1	Measuring the effects of cognitive models and schemas, attitudinal inclinations, self-motivational drives, and workplace learning setting on the students' perceived development of professional skills during on-the-job learning	Quantitative Confirmatory factor analysis	Survey data sample of 285 graduating Finnish vocational students
2	Measuring the effects of factors related to the workplace learning setting on the students' perceived development of professional skills during on-the-job learning	Quantitative Confirmatory factor analysis	Survey data sample of 285 graduating Finnish vocational students
3	Examining how organization- and individual-related factors enhancing workplace learning from vocational students' perspective are related to workplace instructors' assessment and grade	Quantitative Partial Least Square (PLS) SEM	Survey data sample of 100 graduating Finnish vocational students and their workplace instructors
4	Examining the course of the vocational students' on-the-job learning period	Qualitative Multiple-case study	20 cases of the Finnish vocational students' workplace learning periods and 14 workplace instructors (some instructors had two or three students to guide) Data gathered from personal meetings at the beginning and end of the on-the-job learning period, semi-structural interviews, confidential discussions, and the researcher's observations and notes during workplace visits
5	Examining the contributors of the vocational students' successful on-the-job learning period	Qualitative Comparative case study	20 cases of the Finnish vocational students' workplace learning and 14 workplace instructors (some instructors had two or three students to guide) Data gathered from personal meetings at the beginning and end of the on-the-job learning period, semi-structural interviews, confidential discussions, and the researcher's observations and notes during workplace visits

3.1 Methodological approaches

In addressing the research sub-questions, this study used different types of methodologies (Proctor & Vu, 2007). A multimethod approach was considered necessary in order to gain a more comprehensive idea of contributors to the vocational students' successful on-the-job learning than a quantitative or qualitative approach alone would have produced. Article 1 is quantitative in nature and focuses on the first sub-question: *what are the factors that positively influence the vocational students' on-the-job learning, from a student perspective*. The study collected the vocational students' views about their on-the-job learning environment (for example innovative climate and interaction with seniors) and evaluations from themselves (for example self-efficacy); also the students' views about how well their professional skills developed during workplace learning. Then the study analyzed the relationships between the students' views concerning the workplace learning environment, themselves, and perceived development of their professional skills. As a result, the study identified a set of organization- and individual-related factors that, from the students' perspective, positively influenced the vocational students' development of professional skills. Article 2 is related to the same sub-question as Article 1, but it is focused on how the students' views about workplace learning environments are related to their views about development of professional skills. This study was conducted in order to complement Article 1 and to provide more detailed knowledge of these elements because organizations have a substantial role in the students' on-the-job learning during VET studies and the results of Article 1 suggested that they substantially impact the students' on-the-job learning. Thus Article 2 deepens the results of Article 1 in terms of a more elaborated examination of the organization-based factors promoting vocational students' workplace learning. Article 3 handles the second sub-question: how the relationship between the factors that vocational students consider to enhance on-the-job learning and assessments from workplace instructors differs from the relationship between these factors and formal grade. This article examined how organization- and individual-related factors enhancing workplace learning from the vocational students' perspective are related to 1) workplace instructors' assessment of successful on-the-job learning and 2) the formal grade given to the vocational skills demonstration. The organization- and individual-related factors that the vocational students considered to promote their on-the-job learning used in Article 3 were based on the results of Article 1.

Article 4 is qualitative and is related to the third sub-question of *what factors differentiate the on-the-job learning period of highly successful students form less successful ones.* A qualitative methodology is used to

describe the structure of the Finnish on-the-job learning period based on VET curricula by identifying the different phases of the students' on-the-job learning period and the key characteristics of each phase. Article 5 is related to the same sub-question as Article 4 and is also qualitative in nature, using a comparative case study research strategy to examine the graduating students' on-the-job learning periods in order to identify contributors to the students' successful workplace learning periods.

The nature of the sub-questions guided the choice of appropriate approaches. The first sub-question concerns which factors, from a student perspective, positively influence vocational students' on-the-job learning. The second sub-question looks at how the relationship between the factors that vocational students consider to enhance on-the-job learning and assessments from workplace instructors differs from the relationship between these factors and formal grade. In order to identify the positive influence of a set of factors on the workplace learning of vocational students and how certain factors are related to specific constructs, it is necessary to use a quantitative approach. The nature of the first and second sub-questions requires examination of statistical relationships and hypotheses testing. Generally, the quantitative approach is used when research questions include hypotheses proposing, testing, and finding out statistical relationships (Ghauri & Grønhaug, 2002). The quantitative approach is therefore considered an appropriate method for Articles 1, 2, and 3 of this study. This approach reflects the positivistic idea in the sense that objectivity is pursued by maintaining distance from those researched. The items used in this study are based on extant literature.

The third sub-question of what factors differentiate the on-the-job learning period of highly successful students from less successful ones aims at a deeper understanding of the phenomenon of on-the-job learning period from the informants' (the students and workplace instructors') point of view (Ghauri & Grønhaug, 2002), which makes the qualitative method appropriate for Articles 4 and 5. The key point here is to examine the workplace learning *periods* of the vocational students. It is necessary to consider a single student's on-the-job learning period and compare each student's period in order to identify what factors are common for highly successful students but are not present or are only weakly present in the workplace period of a less successful student. This type of research requires a qualitative approach using case studies. The case study method is specifically appropriate when the goal of a research question is to provide a profound description of how a phenomenon works (Article 4) and comprehensive capturing of real situations (Article 5) is required (Yin, 2009). Article 5 studies contributors to the students' successful on-the-job learning

in authentic situations, i.e., in organizations where the students perform their on-the-job learning period. In the present study, the qualitative method used in Article 4 increased understanding of the structure and key phases of the students' on-the-job learning period, while Article 5 provided deep understanding of factors that contribute to the students' successful on-the-job learning period by comparing the students' on-the-job learning periods. The qualitative approach enabled the researcher to get into the world of those being researched and understand their conceptions and interpretations related to the studied phenomenon.

3.2 Quantitative research: Articles 1, 2, and 3

This section describes the data collection, measures, and analyses used in Articles 1, 2, and 3, providing a statistical examination of individual- and/or organization-based factors that enhance the vocational students' professional skills development during on-the-job learning, the effects of the factors, and their possible mutual relationships.

3.2.1 Data collection

The data were gathered from 285 graduating Finnish vocational students from two vocational institutions, using a structured internet-based survey instrument for the purpose of collecting the students' views about their workplace learning environment, evaluations about themselves, and their views about professional skills development during on-the-job learning. Statistical methods were then used to analyze the relationships between the students' views. A total of 60 percent of the respondents were females and 40 percent were males. A majority of respondents, 75 percent, indicated ages between 18 and 20. Out of eight total fields of the Finnish VET system, the respondents represented seven fields: 1) Culture, 2) Natural Sciences, 3) Technology and Transport, 4) Natural Resources and the Environment, 5) Social Services, Health, and Sport, 6) Tourism, Catering, and Domestic Services, and 7) Social Sciences, Business, and Administration. The vocational institutions included in this study did not provide the field of Humanities and Education. Table 4 represents the respondent characteristics in detail. The graduating students were chosen because they were about to begin careers and possessed all the knowledge that VET can offer, including the obligatory on-the-job learning periods. The studied on-the-job learning period was the students' last one during VET studies. The students answered an internet-based questionnaire right after finishing their final on-the-job learning period. The majority of the questionnaire issues concerned this particular on-the-job learning period. The questionnaire included a general section on previous work experience and background

information. It was sent by email to 600 graduating students in two Finnish vocational colleges, and 289 responses were received. After removing incomplete answers, the number of observations in this study was 285. The response rate was 48. The data collection occurred between February and May 2012. The students graduated in May 2012.

Table 4. Respondent characteristics

Gender/Age	% of respondents	Number
Female	59.6	170
Male	40.0	114
Total	99.6	284
Note: one respondent did not indicate his/her gender		
age 18–20	75	214
age 21–25	15	43
age > 25	9	27
Total	99	284
Note: one respondent did not indicate his/her age		
Study sector	% of respondents	Number
Culture	16	46
Natural Sciences	6	17
Technology and Transport	20	57
Natural Resources and the Environment	5	14
Social Services, Health, and Sport	15	43
Tourism, Catering, and Domestic Services	17	48
Social Sciences, Business, and Administration	21	60
Total	100	285
Previous degrees	% of respondents	Number
No previous degrees	78	222
Vocational qualification or matriculation examination	22	63
Note: one respondent studied for both degrees)		
Total	100	285
Work experience Number (excluding previous on-the-job learning periods)	% of respondents	
In the professional field studied	68	195
No work experience in the professional field studied and/or	32	90
In other professional fields	78	221
No work experience in other professional fields	22	64
Work experience in the field studied, regular tasks		
1–3 months	50	144
4–6 months	24	67
7–9 months	11	31
10–12 months	4	12
> a year	4	11
No work experience in the field studied, regular tasks	7	20
Total	100	285

Construction of the students' questionnaire used in this study was a long and challenging process. It began by searching and reading previous theoretical and empirical studies in the field of on-the-job learning. It turned out that the literature was huge and far from consistent. Due to several existing concepts and definitions of workplace learning, there were many different approaches and methods used to examine the phenomenon. However, one common factor combined many viewpoints of on-the-job learning: learning through work requires the input from both workers and the workplace. As discussed earlier, research in on-the-job learning has a long history, especially in terms of studying adult learning (Karakowsky & McBey, 1999; Pavlis Korres & García-Barriocanal, 2008), and there is some rather scant literature that examines workplace learning from the students' perspective as well (Virolainen, 2007; Virtanen & Tynjälä, 2008). However, empirical (Cronin, 2014) and especially statistical studies on the vocational students' (representing various vocational fields) curriculum-based on-the-job learning that examine a larger variety of factors affecting students' workplace learning are very few (Virtanen et al., 2014). Virtanen et al. (2014) studied the relationship between student-related individual factors, social and structural features of the workplace, and educational practices related to how students' workplace learning periods were organized on students' workplace learning outcomes measured through Finnish vocational students' self-appraisal (1603 final year vocational students from six fields of Finnish VET). Individual factors included students' motivational orientations and prior work experiences. Social and structural features of workplaces consisted of the following factors: students' experiences of work communities, discussion at work, content of guidance discussions, and size of the workplace. Among the educational practices were factors such as integration of school learning and workplace learning, different forms of guidance, length of completed workplace learning periods, setting goals for the on-the-job learning periods, and students' assessment of their own work. They found that all these aspects were important for students' workplace learning. Among the social and structural features of workplace students' opportunities for active participation, the enabling of professional development and the guidance discussions between a student and a workplace instructor were significantly related to students' workplace learning outcomes. Integration of learning at school and workplaces was found to be crucial in the category of educational practices. Among student-related individual factors, invention orientation and learning orientation were related to students' workplace learning outcomes. The present study used a larger and more versatile set of factors in examining organization- and individual-related factors that contribute to the successful workplace learning of vocational students. Furthermore, this study included workplace instructors' perspective on successful workplace learning, and the formal grading

of the vocational skills demonstration, and examined the relationship between them and factors that students' considered to positively affect workplace learning.

The first step in limiting the large amount of workplace learning literature functioning as the basis for the questionnaire formulation was to leave out studies that did not focus on examining the impact of individual- and workplace-related factors on on-the-job learning, such as literature pondering the formal or informal nature of on-the-job learning (Berings et al., 2006) and focusing on workplace learning activities to promote organizational effectiveness (Scheeres et al., 2010). The second step was to concentrate on empirical studies that used different types of scales and items to capture and measure factors supposed to affect on-the-job learning. The first step gave an overall idea of factors that scholars have found to influence workplace learning. The second step revealed the variety of scales used to examine this phenomenon.

A problem in constructing the questionnaire was that extant literature has strongly focused on adults' and professionals' workplace learning. The researcher could not find theoretical or empirical studies clearly demonstrating similarities and/or differences between factors that affect on-the-job learning for adults and students, especially vocational students. There are several indications of differences between adults/employees and vocational students in this respect. For example, the vocational students' on-the-job learning is a mandatory and regulated part of the Finnish VET. In addition, a single on-the-job learning period is relatively short (about eight weeks). This setting is different from that of employees or even novice professionals, which may impact the students' attitudes, motivation, and actions. The students are not employees and their on-the-job learning goals are different from those of workers. Furthermore, vocational students are not required to master their future profession as well as employees must, although they are expected to handle the basic rules of work life and grasp fundamental professional skills. In sum, selecting scales and items affecting the vocational students' on-the-job learning was not simple. To get started, it was necessary to simply accept the wide range of possible factors.

The third step was to construct a Word table summarizing the measures and items used in extant studies that examined factors supposed to affect on-the-job learning. The result was 49 pages of measures and items (what was measured and how) and references to studies (previous studies, what the items and measures included theoretically) covering a total of 37 studies and 41 different metrics. The measures and items were organized under general headings or factors such as prior knowledge, attitudes/motivation,

factors related to workplace setting, and individual-related factors. These factors were divided into sub-sectors. For example, organizational setting included, among other sectors, innovative climate, knowledge transfer, and trust. These sub-sectors were used as constructs in the actual statistical analysis. The Word-table was carefully read several times. The most challenging part was to choose measures and single items to examine a specific construct. The organization- and student- related factors examined in this study and their relation to the theoretical framework discussed in Section 2 were: 1) students' prior work experience (cognitive models, prior knowledge), 2) work alienation and work ethic (attitudes), 3) innovative climate, 4) perceived usefulness of guidance (supervision and guidance), 5) interaction with seniors (including an item addressing the feeling of being a member of the organization), 6) psychological climate (the workplace instructors'/superiors' impact), 7) students' views concerning development of their professional skills (including an item about understanding the goals of workplace learning), 8) knowledge transfer accuracy, obtaining knowledge, shared cognitive ground, knowledge sharing, perceived receipt of useful knowledge, tie strength with seniors, and availability of seniors (different dimensions of knowledge transfer/sharing), 9) tacit knowledge (learning tacit dimensions from seniors), 10) trust (different dimensions of trust, including trust toward seniors and the organization, benevolence-based trust, and competence-based trust), 11) learning orientation and performance orientation (motivation, goal orientation), 12) self-efficacy (motivation, including general self-efficacy and occupational self-efficacy), 13) job characteristics, including autonomy and job complexity (providing learning opportunities that improve professional skills and development), and 14) job satisfaction (providing tasks and learning opportunities that improve professional skills and development). These factors were selected for this study because they were considered to capture the relevant aspects of successful vocational students' workplace learning and because their effect on workplace learning in general was explicitly identified in previous literature. A guideline in selecting items for the study was that they could be used to describe aspects of students' working life experiences and their self-evaluations. As a consequence, items concerning, for example, the impact/importance of salary and items that clearly required professional or work life experience were excluded. Furthermore, the aim was to use measures with reverse items and to include ensuring items (for example, two items expressing the same idea from different perspective) in order to increase the reliability of the chosen measures. It was considered important to include different perspectives and dimensions of a certain construct in the questionnaire because the researcher did not want personal ideas and experiences to affect the selection of measures and items. As a result, the questionnaire became rather comprehensive. The final wordings (given in Appendix I

together with added sources of the measures) did not include academic concepts such as self-efficacy, innovative climate, or knowledge transfer. Instead, the student was asked to “think about the last on-the-job learning period and answer the following items.” Before the research was executed, a sample of students pre-tested and commented on the questionnaire. The students’ feedback indicated that in addition to the questionnaire being considered comprehensive, the items were clear and understandable.

The workplace instructors received an internet-based questionnaire by email right after the student under his/her guidance had finished the on-the-job learning period. The questionnaire was sent to 358 workplace instructors whose email addresses were accessible at the time and 156 of them responded. After connecting each workplace instructor’s response to the respective student’s response, 100 responses were left. More specifically, there were 100 total response units including both a student’s response and his/her workplace instructor’s response. Constructing the questionnaire for the workplace instructors was problematic. Unfortunately, neither the academic literature, the vocational institutions, nor the Finnish National Board of Education provides established, solid, or validated measures for the purpose of evaluating workplace instructors’ perspectives on students’ learning or success during on-the-job period. The Finnish vocational institutions have varied practices regarding feedback collection from the workplace instructors. Some schools use internet-based questionnaires from different sources. These questionnaires may be used as-is or schools may add their own items. Other schools use their own questionnaires. As a consequence, contents and themes in the questionnaires are very different. At one end, a questionnaire may concentrate solely on evaluating the relationship between the school and the on-the-job firm and may cover several sections (for example, planning, implementation, and overall evaluation of the on-the-job learning period and the vocational skills demonstration, and a section concerning the student’s development through work) at the other. The problem is that internet-based questionnaires allow only one response per workplace instructor and hence it is not possible to obtain information from instructors who have more than one student to guide. The two vocational institutions used in this study had different systems for gathering workplace instructor feedback. Because the internet-based questionnaires are paid services for a specific school and there are copyright aspects to take into account, it was not possible for the researcher to use similar internet-based questionnaires for both schools in order to collect feedback from the workplace instructors.

For these reasons it was decided to adapt extant measures and items from studies related to the subject and consider these items from the workplace instructors’ perspective. Of course, there are many possible ways to

approach the workplace instructors' viewpoints regarding the students' learning during on-the-job period. This study adopted the focus of the students' perceived occupational competence and its development during on-the-job learning (Ellström, 1997; Kock & Ellström, 2011; Michels et al., 2012). This approach was seen as appropriate because firms consider workplace learning a means for students to gain competences (Michels et al., 2012). Furthermore, one of the core functions of the Finnish vocational students' on-the-job learning is to enhance students' competence through professional skills development; hence this approach was considered a natural starting point for the workplace instructors' questionnaire. The questionnaire was consciously constructed to be short, including only 10 items which were designed to be easy to answer, because according to the researcher's experience, workplace instructors are very busy, and furthermore, may also be targeted for other questionnaires. For example, a workplace instructor may guide several students from different classes or years as well as different schools, such as vocational institutions and universities of applied sciences. An experienced workplace instructor who was very responsible about the duty of guiding students pre-tested the questionnaire, concluded that it was easy to answer, and confirmed that the items were relevant from the workplace instructor's point of view. The workplace instructors' questionnaire is represented in Appendix II and includes the sources of the measures. Because it was possible to identify the student (through his/her email address and name asked in the workplace instructors' questionnaire), the workplace instructor (through his/her email address), and the vocational institution (through the workplace instructors' questionnaire), it must be emphasized that the responses were handled with strict confidentiality. Only the researcher saw this information. The student's name and school were needed in order to combine the student with his/her workplace instructor (Article 3).

3.2.2 Measures

In examining the vocational students' views about their workplace learning environment, evaluations about themselves, and views about how well their professional skills developed during on-the-job learning, this study adopted and adapted measures suggested by the literature and used and validated in previous studies (Churchill, 1979; Bui & Baruch, 2011). The only items constructed by the researcher were items in Section 24 in the students' questionnaire (Appendix I), based on studies by Rampersad (2004), Kock and Ellström (2011), and Sundberg (2001), in order to complement items related to the students' successful on-the-job learning and the item "Seniors had time to guide me in learning new things" in Section 25, based on Wilkesmann and Wilkesmann (2011), supplementing the other questions in that section. As discussed

earlier, the selection of measures for the present study was not easy because there is a large number of previous studies on factors that are suggested to affect workplace learning, but they are focused on professionals' or adults' learning at work. Regarding some constructs used in the study, it was considered appropriate to select items from various validated scales in order to obtain a diversified set of measures. Furthermore, including variables that theories discuss from different viewpoints ensures that the key predictive variables are included; thus any specification errors can be avoided.

The Word table of measures and items discussed above helped to form the constructs and theoretical framework (Ghauri & Grønhaug, 2002) that were used in the students' questionnaire and examined through statistical analysis. The vocational students assessed the constructs from their point of view. It was not surprising that the number of items considerably diminished when the data was statistically analyzed on the basis of the students' responses, because extant literature does not provide established measures for factors that influence the vocational students' successful on-the-job learning, or clear differences between the vocational students' and the employees' learning through work. In sum, it was considered appropriate to include a large number of constructs instead of making a selection in advance on the behalf of the vocational students, because the literature does not provide sufficient theoretical or empirical ground for such selection. Table 5 summarizes the measures used in the study.

Table 5. Measures used in the study

Measure	Concept	Definition	Number of items/item example	Source
Students				
Previous work experience	Students' previous work experience in the industry studied regarding regular tasks	Type of previous knowledge that is supposed to facilitate a learner to construct new knowledge	6 - 1-3 months - 4-6 months - 7-9 months - 10-1 months - more than a year - no work experience	students' answers in the questionnaire
Work alienation	Students' attitudes toward work and working life	An individual's general tendency to experience psychological detachment from working life	3 "I find it difficult to imagine enthusiasm concerning work"	adapted from Hirschfeld & Feild (2000); Hirschfeld et al. (2000)

Performance orientation	Students' willingness to orient themselves towards competence demonstration and getting positive evaluation from seniors	An individual's goal orientation preference in achievement situations, focusing on demonstrating current competence compared with others, and the achievement of positive evaluations from people considered important	1 "It is important to me that my co-workers consider me a professional"	adapted from Sujan et al. (1994)
Self-efficacy	Students' beliefs about their abilities to accomplish given tasks	An individual's belief in his/her capacity to accomplish a given task	3 "I am confident that I can perform effectively on many different tasks"	adapted from Chen et al. (2001); Hellriegel & Slocum (2007)
Perceived usefulness of guidance	Perceived impact of guidance received from seniors on students' work performance during workplace learning	Guided learning strategies, including modeling and coaching, that enhance learning through work	3 "Guidance during this on-the-job learning period has improved my work performance"	adapted from Stone et al. (2007)
Psychological climate	Students' perceived receipt of support and workplace instructors' commitment to the students and their guidance	Shared perceptions of individuals concerning the practices, procedures, and kinds of behavior that get rewarded and supported in a certain setting	3 "The workplace instructor took time to orient me"	adapted from Amenumey & Lockwood (2008)
Knowledge transfer: obtaining knowledge	Obtaining knowledge through the interplay between students and seniors	A means for the organization to support activities that encourage knowledge transfer between novices and experts	1 "Seniors supported my efforts to gain work experiences"	adapted from Wilkesmann & Wilkesmann (2011)

Innovative climate	Ability of students' workplace learning organizations to provide opportunities for exploring and trying new work methods	An atmosphere shared by all organization members that values innovations, accepts risks and mistakes, and is able to manage risks	2 "My on-the-job learning firm encourages me to find new ways around problems"	adapted from Stone et al. (2007)
Interactions with seniors	Influence of interaction with senior colleagues on students' professional growth and being integrated to the work community	A social perspective of individual learning within organizations, creating opportunities for social and informal interaction, and enhancing creation of professional knowledge	2 "My interactions with the seniors have had a positive influence on my professional growth, attitudes, and interest towards the industry"	adapted from Pascarella & Terenzini (1980)
Autonomy	Students' autonomy in job performance and given responsibility	The degree to which an individual is able to schedule his /her work independently and have a say in deciding about the procedures and equipments to be used	4 "I was allowed to handle a task from beginning to end by myself "	adapted from Sims et al. (1976); Warr et al. (1979)
Development of professional skills (dependent variable)	Measured the students' satisfaction towards the extent of their skills development during the workplace learning, their overall satisfaction towards the work experience obtained during the on-the-job learning period, and the positive impact of this work experience on professional growth	Students' acquisition of profession-related skills and knowledge required by their future occupation	3 "I am satisfied with the extent of my professional skills development during this on-the-job learning period"	adapted from Pascarella & Terenzini (1980)

Knowledge transfer efficiency	How accurately students follow work procedures learned from seniors	The extent to which the receiver of knowledge follows the source's practice	5 "I modified the methods I learned from the seniors in order to make them more workable"	adapted from Szulanski et al. (2004)
Senior colleague support	Students' relationship with seniors and availability of seniors when students needed information or advice	An aspect of knowledge transfer affecting the efficiency of the transfer between the knowledge acquirer and source	6 "When I needed information or advice from the seniors someone was always nearby"	adapted from Levin & Cross (2004)
Grading of the vocational skills demonstration	Measures how well students have managed to learn professional skills required by their future occupation during workplace learning	Vocational skills demonstration is a mandatory part of the evaluation of vocational modules given in authentic work situations, and is planned, implemented, and assessed together with a student, a teacher and a professional representative	A single item 1 = satisfactory 2 = good 3 = excellent	students' answers in the questionnaire

Workplace instructors		
Items	Definition	Source
1. After orientation, the student performed the tasks given to him/her in a professional manner	Occupational competences required in authentic work situations in terms of direct skills needed in a certain profession, quickness, and handiness of work performance and social skills	based on Ellström (1997); Kock & Ellström (2011), Pascarella & Terenzini (1980
2. The student had the ability to perform versatile tasks		based on Ellström (1997); Kock & Ellström (2011), Pascarella & Terenzini (1980)
3. The student adapted him/herself well to the work community		based on Ellström (1997); Kock & Ellström (2011)

4. The student's practical work was fluent		based on Ellström (1997); Kock & Ellström (2011)
5. The student was able to utilize the feedback he/she received in performing tasks		adapted from Hurley (2002)

The observed variables were measured using a six-point Likert scale: 1=strongly disagree, 2= disagree, 3=somewhat disagree, 4= somewhat agree, 5=agree, and 6=strongly agree. The option "n/a" was provided in the questionnaire but was removed from the analyses. Exceptions from this type of scale were the background data and the senior colleague support variable, where the items were measured using a six-point Likert scale anchored by "very close" and "distant" (KTTIE 1), "several times a day" and "never" (KTTIE 2), items related to the form of the received information and advice anchored by "all" and "not at all" (KTTACIT 1), and "mainly in written form" and "mainly practical information and advice" (KTTACIT 2). Again, the option "n/a" was provided in the questionnaire but removed from the analyses.

The constructs used in the quantitative research of the present study can be divided into four categories: cognitive, attitudinal, motivational, and organization-related. Firstly, previous work experience denoted the students' cognitive predisposition needed to develop professional skills through on-the-job learning. This is based on the constructivist theories considering existing knowledge crucial for further learning (Vermunt, 1998). The present study specifically considered previous work experience in the field studied and the performance of regular tasks because the literature has found that prior work experience similar to present tasks enhances learning (Anakwe & Greenhaus, 2000). Secondly, the items related to work alienation reflected the students' overall attitudes towards work and work life (Hirschfeld & Feild, 2000). Thirdly, the scales used to measure learning orientation (Sujan et al., 1994) and self-efficacy (Chen et al., 2001) denoted the students' motivational factors. Performance orientation is a motivational variable used to measure the students' need to be considered competent and the need to be evaluated positively on their preset performance by significant others (Sujan et al., 1994). Self-efficacy measured the students' conceptions about themselves regarding mastering the given tasks/different tasks successfully (Bandura, 1986). Fourthly, the organization-related constructs (for example Stone et al., 2007) revealed the students' views of the on-the-job learning firm, especially the workplace instructors' actions regarding their actions and guidance.

The measures in this study gave results that were based on the students' self-appraisal. The current study examined subjects that are difficult to observe and measure otherwise: work alienation, performance orientation, self-efficacy, received guidance, and interaction with seniors. The students were seen as the best sources of knowledge regarding the assessment of the factors that affect the development of their individual professional skills during on-the-job learning. Generally, increasing interest in workplaces as learning environments requires that organizations are aware of the factors that the learners consider crucial in enhancing on-the-job learning. This study examined how the students' experiences of workplace learning environment and their evaluations regarding themselves were related to the students' views about professional skills development during on-the-job learning.

There are few objective measures in the area researched in this study. The formal grade for vocational skills demonstration given at the end of the on-the-job learning period provides one objective measure of learning professional skills. However, its use is not straightforward. Firstly, not every on-the-job period ends with a vocational skills demonstration. Secondly, the grading scale for Finnish vocational upper secondary qualifications changed from a five-tier scale (5=excellent, 1=satisfactory) to a three-tier scale (3=excellent, 1=satisfactory) at the beginning of August 2009. Although workplace instructors, students, and teachers have, in general, accepted and adapted themselves to this change, it became clear during this research process that some participants in this study were still reluctant to accept the change. In informal discussions, they considered the new reduced grading scale difficult to use. Some workplace instructors and teachers clearly expressed that the new grading scale is too tight and they miss the opportunity to give fours and twos. Consequently, they told that they are cautious in grading and tend to prefer higher grades: if you cannot give a four you give a three instead of a two. In the present study the mean of the grades for the vocational skills demonstration was 2.57 and the standard deviation was 0.593 (N = 285). A total of 178 students (62%) got a three, 92 students (33%) received the grade of two, and 15 students (5%) got a one. The distribution of grades is clearly negatively skewed and, thus does not follow normal distribution. It would have required a larger sample to see if the skewness of the distribution is a common phenomenon. However, there are statistical tools that are able to handle constructs that deviate from normal distribution.

Another problem typical of primary data collection (Ghauri & Grønhaug, 2002) was that the workplace instructors were reluctant to answer the questionnaire. The workplace instructors received by email a short internet-based questionnaire with 10 items. All these items shown in Appendix II form a single construct

representing occupational competence. The workplace instructors assessed the vocational students under their guidance by evaluating the students' profession-related performance during on-the-job learning. This approach is based on a specific view of occupational competences required in authentic work situations in the form of the direct skills needed in a certain profession, the quickness and handiness of work performance, and social skills (Ellström, 1997). The workplace instructors assessed the students' performance through the following objectives: whether the students performed the tasks given to them in a professional manner (Ellström, 1997; Kock & Ellström, 2011; Pascarella & Terenzini, 1980), the students' ability to perform versatile tasks (Ellström, 1997; Kock & Ellström, 2011; Pascarella & Terenzini, 1980), adjustment to the work community (Ellström, 1997; Kock & Ellström, 2011), fluency of the students' practical work (Ellström, 1997; Kock & Ellström, 2011), and ability to utilize feedback received from seniors (Hurley, 2002).

The estimated time of answer was 15 minutes (if the workplace instructor had more than one student to guide). This was clearly mentioned at the beginning of the questionnaire. The questionnaire was sent to 358 workplace instructors and 156 responded. After connecting the workplace instructor's assessment to the respective student, 100 responses were left. This small sample was due to two reasons. Firstly, in this study it was necessary to confidentially identify the students in order to associate the workplace instructors' responses to particular student's responses, which reduced the size of the sample because not every student and workplace instructor answered the questionnaire. Secondly, many workplace instructors may have ignored the questionnaire due to the hectic work environment with multiple tasks which is reality in many contemporary organizations whether small, medium, or large, or because they possibly receive several questionnaires from different agents. It did not seem to help that they received the questionnaire right after the students' on-the-job learning period and those who had not responded within a reasonable time got two reminders.

3.2.3 Analyses

The data of Articles 1 and 2 were analyzed by using factor analysis and Structural Equation Modeling (SEM). For this purpose, SPSS and linear structural relations (LISREL) was used. Partial least square (PLS) software was used in Article 3. The measures in Articles 1 and 2 were formed and validated by using

confirmatory factor analysis (CFA); after that SEM was used for hypotheses testing. The SEM models were assessed by using LISREL 8.80 with the maximum likelihood procedure and the covariance matrix.

CFA provides a means to assess how well the gathered data fit the specified model (Schreiber et al., 2006). In general, CFA is deemed useful when it is possible to build a model justified by existing theories and then test the relationships between the observed and the latent variables (Sureshchandlar et al., 2002). As Sureshchandlar et al. (2002) emphasized, the use of CFA requires the construction of hypotheses based on previous research in order to identify and select factors that are related to the latent variables. CFA was considered appropriate for the present study because it was possible to specify the variables and form the constructs with the help of previous theories and studies. Consequently, the relationships between the observed and latent variables in the current study were suggested by previous theories and studies. SEM is a technique used to analyze hypothesized relationships. An advantage with SEM is that it makes it possible to consider latent variables (Schreiber et al., 2006). A latent variable represents an abstract phenomenon that can be approximated through variables that are observable or measurable. Latent variables can be hypothesized with the help of existing theories, but they are difficult to observe directly (for example, individual characteristics). They enable operationalizing and testing theories otherwise impossible to verify and allow the examination of complex authentic phenomena. In the current study, the questionnaire to which the students responded provided a set of observed variables to form latent variables. The measurement models were used to describe how a specific latent variable was operationalized by the related observed variables. Furthermore, they indicated the validities and reliabilities of the observed indicators. An indication of the usefulness of the scales, (i.e., validity) used in this study was the very high values of comparative fit index (CFI), well above the traditional threshold value of 0.90 (Articles 1 and 2), which implies that the items share a common core (Sureshchandlar et al., 2002). Further analyses used in this study were composite reliability (CR), average variance extracted (AVE), and discriminant validity (to show that the constructs used in the study are clearly different) which have been suggested by Fornell and Larcker (1981) among others. These analyses complement the *t*-test and the chi-square test reported in the LISREL results. As stated above, the scales used in the present study are based on previous studies and can be repeated over time.

Article 3 used the partial least square (PLS) SEM analysis in order to estimate the hypothesized causal relationships between the variables studied. PLS is an appropriate method of analyses in cases of non-normally distributed data, small sample sizes, and exploratory studies (Hair et al., 2011; Hair Jr. et al.,

2014).The sample size in this study was only 100 because the workplace instructors' responses were combined with the responses of the students who performed the workplace learning period under their guidance, and the grades of the vocational skills demonstrations were not normally distributed. The composite reliability values of the constructs were well above the threshold values discussed above, demonstrating high levels of internal consistency reliability. The convergent validity of the constructs in this study was determined by two criteria. First, the average variance extracted (AVE) value of each construct should be 0.50 or higher. The AVE values of the constructs in the study were above the criteria value of 0.50. Second, the outer loadings of each individual indicator should be above 0.70, which was also fulfilled. In this study, all square root values of AVE were higher than the correlations between latent constructs, and thus, the discriminant validity was established (Hair et al., 2011). This result shows that each construct shares more variance with its measures than it shares with the other constructs of the model (Fornell & Larcker, 1981).

This study did not include firm-specific factors such as firm size measured in sales and the number of employees or the firm sector. Previous studies have suggested that firm sector (Doray & Arrowsmith, 1997) and firm size (Cappelli & Rovgovsky, 1994) affect workplace learning, but these studies are focused on adult learning. It is understandable that the firm size and sector can influence the employees' opportunities for workplace learning. However, the vocational students' on-the-job learning functions on a different basis. First, there are many branches where firms are typically small, such as upholstery, product design, rural entrepreneurs, and hairdressing, but they have managed to provide a good learning environment for vocational students. Second, the main criteria of the vocational students' on-the-job learning firms are that they are able and willing to provide an appropriate learning environment for the students no matter the size or sector, and are able to meet the requirements and goals set for the students' workplace learning in curricula.

The focus of this study was specifically on the vocational students' perceptions of successful workplace learning because there are not many statistical studies in this field (Virtanen et al., 2014). Furthermore, the planning and development of the Finnish VET system is mainly based on cooperation between vocational institutions and working life; for example, vocational qualifications and vocational skills demonstrations are designed to meet the requirements of contemporary working life whereas vocational students have less say

in development of VET-based workplace learning. Because vocational students' viewpoints have gained less attention, at least in formal discussion in Finland, it was considered important to draw attention to the vocational students' viewpoint in order to contribute to the field of workplace learning.

The study reached its goals by identifying, from a large number of factors that extant literature has suggested to affect workplace learning (Billett, 2001; Schyns & von Collani, 2002), the elements that the vocational students considered important for successful on-the-job learning. The quantitative research method was useful because it is objective in nature and provides an opportunity to produce results that do not depend on the researcher's values, perspectives, and experiences or the various viewpoints related to on-the-job learning that were discussed in Chapter 2. This was considered important because the elements that contribute to the vocational students' on-the-job learning are less studied. The measures used in the students' questionnaire covered the variety of factors that extant literature has considered to influence workplace learning, categorized in this study as workplace- and individual-related. Considering all articles that used the quantitative method together, all constructs included in the questionnaire were related to the results except for three constructs: job satisfaction, job characteristics, and job complexity. However, the number of items related to a specific construct clearly diminished in each article compared to that of the questionnaire. This was for two reasons. First, the questionnaire was intentionally constructed to cover numerous and multidimensional perspectives on factors that previous studies have found to affect workplace learning. The present study differs from the previous ones in examining simultaneously a large set of organizational- and individual factors. The vocational students did not assess all these dimensions to positively influence their on-the-job learning, but the results showed the most important ones from their perspective. Second, this study analyzed the workplace- and individual-related constructs together instead of conducting a statistical analysis of each construct separately. Conducting a statistical analysis separately on each construct may have produced more detailed ideas and results of the phenomenon. However, the present study analyzed the constructs together in order to add other perspectives considered more important for the purpose of the study, namely, interactions between different constructs which it would not have been possible to examine if the constructs had been analyzed separately.

The literature has related job satisfaction (Rowden & Conine, 2005) and job characteristics (Raemdonck et al., 2014), including job complexity (Nembhard & Osothsilp, 2002), to workplace learning through tasks and learning opportunities provided by the firm, but these constructs were not significant from the students'

perspective. One possible reason for this might be that the job-related items were overlapping with other constructs used in this study and the students did not consider them relevant as separate constructs.

Carefully scheduled sending of the questionnaires to the students and workplace instructors increased the accuracy and trustworthiness of the study. The questionnaire was sent to the students and workplace instructors right after the specific on-the-job learning period was finished in order to ensure that the participants had everything still fresh in their memory. The right timing was possible because the researcher contacted the schools and got information in order to construct a schedule of on-the-job learning periods for the final year classes during the spring term 2012. Students' and workplace instructors' email addresses were also obtained from the schools.

The use in this study of constructs such as self-efficacy (motivation), prior knowledge (cognitive models), and work alienation (attitudes), each of them a rather large concept, may raise questions about their connections to on-the-job learning. For example, prior knowledge is a term with many dimensions such as attitudes, ideas, and theoretical and practical previous knowledge. Furthermore, it is difficult to conduct a study including all aspects of prior knowledge because they are not necessarily easy to identify and operationalize. However, there are studies suggesting that prior knowledge influences on-the-job learning (Hodkinson et al., 2004). This study included selected dimensions of prior knowledge considered relevant to the vocational students' perspective on successful on-the-job learning. Recent literature relates self-efficacy (Noe et al., 2013) and work alienation (Brookfield & Holst, 2011) to workplace learning. This study included these factors because it was considered important to use rich and multifaceted data in order to capture the students' perspective. The present study provides a unique contribution by simultaneously examining the effects of self-efficacy, work alienation, and prior knowledge, together with a set of organization-related factors, on the vocational students' successful workplace learning.

3.3 Qualitative research: Articles 4 and 5

This section represents data collection, themes of the semi-structured interviews, and the analysis of the data used in the qualitative research. The main goal of these studies was to examine the student's and workplace instructor's viewpoints regarding the vocational students' curriculum-based on-the-job learning period in order to identify the main phases and factors that positively affect the students' workplace learning.

3.3.1 Data collection

The qualitative approach was adopted in Article 4, which concentrated on building a structured model of the vocational students' on-the-job learning periods from the students' and workplace instructors' perspectives in authentic environments. Article 5 examined construction of the students' successful workplace learning period based on the same approach as Article 4. An exploratory approach was chosen in these studies because the research mapped a less-understood research area of the vocational juniors' workplace learning. Generally, a case study method is considered appropriate if the research intends to explain how a specific current real-life phenomenon works and to capture its holistic characteristics (Yin, 2009). Thus, a multiple-case approach, where a single case is a student's on-the-job learning period, was chosen for Articles 4 and 5 in order to gain an in-depth description of the phenomenon (Yin, 2009), which in this study means understanding the course of the students' on-the-job learning period and elements that influence construction of the students' successful workplace learning period.

The qualitative data were gathered from 20 graduating Finnish vocational students during their on-the-job learning periods between October 2009 and March 2010. The sample included 11 male students and nine female students aged between 17 and 19 years. Nine of the students studied in the study sector of Tourism, Catering, and Domestic Services, eight in Social Sciences, Business, and Administration, and three in Technology and Transport. The student's on-the-job learning period ended with a vocational skills demonstration assessed together with the student, the workplace instructor, and the teacher. The assessment objectives are the same for all students: 1) mastering the work process, 2) mastering the work methods, equipment, and material, 3) mastering underpinning knowledge, and 4) mastering key skills for lifelong learning (learning and problem solving, interaction and cooperation, vocational ethics, and health, safety and ability to function). These objectives are evaluated by a numeric assessment scale of 1 through 3 (1 = satisfactory, 2 = good, 3 = excellent). In this study seven students received a grade of 3, 10 students got a grade of 2, two students received a grade of 1, and one student was failed.

The students performed their on-the-job learning period in 14 different firms such as restaurants and various types of stores. Consequently, this study involved 14 workplace instructors, of which eight were males and six females. Two of the instructors had relatively little experience of performing as a workplace instructor and

12 of them were experienced or very experienced as workplace instructors. In this study some workplace instructors were responsible for more than one student.

The Finnish VET system includes more than 50 vocational qualifications and over 100 study programmes confirmed by the Ministry of Education and Culture has. Hence, it is not possible to conduct a multiple-case study where all vocational qualifications or study programmes are represented. This study assumes that the students have different starting points and perspectives regarding on-the-job learning, so it is inappropriate to consider them as typical representatives of a certain vocational qualification or study sector. Similarly, the workplace instructors are seen to have individual insights and experiences about their role as mentors and the students' on-the-job learning.

In this study, the students represented three study programmes: Safety and Security, Cookery, and Customer Services and Sales. Before the actual study the researcher found out which of the final year classes were about to begin their on-the-job learning period at the time the research was planned to start and contacted the teachers responsible for the students' on-the-job learning to explain the research and its goals. Teachers were assured that all parties involved in the study will remain anonymous. The students were selected for the study by the first scheduled workplace meeting at the beginning of the on-the-job learning period; 20 students were eventually selected. A sample of 20 students was thought to be sufficient to capture different viewpoints of on-the-job learning in order to create deep understanding of the phenomenon studied because, due to rich data gathered by various methods, a single case provided a great deal of information. The researcher did not need to select the workplace instructors because they were nominated for the students by the on-the-job learning organization. The researcher's previous experiences indicated that there would be several reasons why the students' on-the-job learning might not be completed; thus, a sufficient sample size was needed for the research not to suffer if such drop-outs did occur.

The students and workplace instructors received a short bulletin about the background and motivation of the research by email or post before the first visit to the workplace. The bulletin assured participants that the research would be confidential: no names or firms would be mentioned. The researcher's standing in the field of VET was given because it was considered to be an advantage that the participants would recognize the researcher's knowledge of the on-the-job learning systems. Knowledge of the researcher's expertise was considered to reduce tension and ensure the authenticity of the meetings. The researcher was not an

observer from outside but an agent from a world that was familiar to all participants. The researcher came to each workplace with the teacher and introduced herself. At the beginning of the first meeting with the student, the workplace instructor, and the teacher, the researcher explained the background of the research, how the research would proceed during the workplace visit, the goals, and the confidential nature of the study. None of the students, workplace instructors, or teachers questioned their participation or hesitated to involve themselves in the research. The meetings proceeded fluently to the actual topics of the first meeting. For the second meeting at the end of the on-the-job learning period, the researcher again came with the teacher and the meeting started immediately.

Data collection occurred in two phases. The researcher met each student at the beginning and at the end of the on-the-job learning period in the student's workplace learning firm. The first meeting was scheduled to occur right after the students had familiarized themselves with the workplace and employees, and had a first exposure to their tasks (typically after two weeks). The researcher was present in the discussion between the student, the workplace instructor, and the teacher, and then, the student was interviewed alone. The workplace instructors were met once in order to gather free comments on the students' performance, development, and other issues that they deemed important. In addition to private discussions, the workplace instructors tended to comment abundantly during the meetings; these comments were taken into account through the notes and observations. The point of the private discussions with the workplace instructors was to give them an opportunity to express things they might be reluctant to say out loud in the presence of the student or teacher. Similarly, the students were able to express themselves freely during the confidential discussions.

The first meeting at the beginning of the on-the-job learning consisted of a general assessment of the period that had just started, plus profession-related issues (for example discussions concerning the students' professional skills level and ability to manage daily tasks). The main theme of the second meeting was the assessment of the vocational skills demonstration that the student had performed at the end of the period (in some cases the student gave a part of the demonstration during the second meeting), and the related discussion between the workplace instructor, the student, and the teacher. The structure and length of the vocational skills demonstration varies by VET fields from several days to single actions. Furthermore, the second session summarized how the student's on-the-job learning period went in its entirety. The length of

the meetings varied from one to two hours. After these sessions, the researcher met each student alone in order to conduct a semi-structured interview and have a free discussion.

The researcher took notes on the course of the meetings, discussions, observations, and the semi-structured interviews during both meetings. It was possible to confirm the accuracy of the researcher's understanding regarding what the participants said or meant on the spot by questions such as "Did you mean…?" or "Did I understand correctly…?". Right after the meetings and interviews, the researcher took time to read the notes carefully and to write down additional observations and details. There were 85 total pages of handwritten notes from the first and second visit to the students' on-the-job learning firms. It was a deliberate choice to take notes throughout the meetings and discussions instead of recording them. This was due to the varying conditions of the on-the-job learning firms that the researcher could not influence. In some firms, it was possible to meet and discuss in a quiet place without interruptions when the recording technique would have worked well. In other firms, the meetings and discussions were held by a restaurant table, near the kitchen, or in the employee coffee room where the noise was loud and interruptions occurred. For example, in one firm where the meetings took place in the coffee room, the discussion was disturbed every time someone dropped in. In another firm, the workplace instructor had to leave the discussion for an urgent situation and employees often interrupted the meetings to ask advice. In yet another firm the researcher had to walk around with the very busy workplace instructor and write down the notes at the same time because the workplace instructor said that the only opportunity to get his viewpoint was discussing while he worked in rather noisy circumstances. Knowing in advance the differences and challenges of different workplace environments, notes were thought to be a more secure method of data collection compared to recordings that might have lead to inaccurate results with some of the words and sentences lost in the overall racket.

3.3.2 Themes of semi-structured interviews

The themes included in the students' two semi-structured interviews and the purposes of the themes are shown in Table 6. In addition, as discussed above, the workplace instructors had an opportunity to comment freely and confidentially on the students' performance from a professional point of view. In the same way, the students were able to express their feelings and ideas concerning, for example, their workplace instructors, other seniors, tasks given to them, and general opinions about the on-the-job learning period. The themes of

the semi-structured interviews were constructed to examine how on-the-job learning appears from the students' point of view.

Table 6. Themes and purposes of the students' semi-structured interviews

Theme	Purpose
Section 1: The first semi-structured interview at the beginning of the on-the-job learning period	
Male/female, vocational qualification studied, class, age Work experience: the field studied, other fields, types of tasks Previous studies	Background information To map the students' prior knowledge
The reasons why the student chose the field studied	To reveal motivation
How does the student assess his/her choice now?	
The student's expectations regarding the on-the-job learning period	To examine - expectations, - learning targets, and - ideas of core factors that affect the learning of professional skills -
New skills/things the student can or wants to learn during the on-the-job learning period	
The most important factors facilitating the learning of profession-related skills during the on-the-job learning period	
How has the on-the-job learning period been going since it started?	To reveal positive and/or negative thoughts concerning the on-the-job learning period, the firm, tasks given, workplace instructors, other seniors, and the organizational climate
Section 2: The second semi-structured interview at the end of the on-the-job learning period	
Pros and cons of the on-the-job period	To provide an overall analysis of the on-the-job learning period from the students' perspective To identify factors that enhance or prevent the learning of profession-related skills
How did the reality correspond to the students' expectations? Why? Why not?	To identify possible sources of deviations: student-based or firm-based To complement the first theme of Section 2
New things and skills learned	To make the student think about his/her learning of professional skills during this on-the-job learning period
Highlights of the on-the-job learning period	To reveal the most inspiring experiences
Free comments	To detect other important themes and issues that the semi-structured interview did not cover

The students' interviews varied typically from 30 minutes to one hour. Due to the hectic pace at the on-the-job-learning firms, the discussions with the workplace instructors typically took less than 30 minutes. Nevertheless, they provided valuable knowledge and ideas considered important from the organizational point of view. Furthermore, most workplace instructors were experienced in guiding vocational students with explicit insights concerning the students' on-the-job learning. The semi-structured interview was a useful

approach for this study because it enables free discussions and, in general, is able to offer new aspects, especially when the research issue at hand is not well understood (Ghauri & Gronhaug, 2002). It did not limit the research merely to a predefined area but gave space to bring up other themes and subjects from the students' perspective.

The first semi-structured interview themes were typed on two A4 sheets, leaving space for writing. The themes of the second semi-structured interview were typed on one A4 sheet. Outlining the themes in advance helped to lead the discussion smoothly from one theme to another. Furthermore, the data remained structured even if the student returned to a certain theme afterwards or brought up things that were not specifically included in the themes.

3.3.3 Analyses

Before the actual analysis of the data, the notes were carefully read several times in order to get an overview of the rich material and examine the information the semi-structured interviews, private discussions, and observation notes gave, first separately and then together. This phase included underlining the notes. The classification grounds of the data became apparent from the research material after several readings. These were the student, the grade given for the vocational skills demonstration, the themes of the semi-structured interviews, the first and second meetings at the workplace, the on-the-job learning firm, and the workplace instructor. Regarding the grade, the students were categorized as excellently (grade 3), moderately (grade 2), and poorly (grade 1 or failed) successful. The first classification action was to arrange the semi-structured interview sheets by the grades given to the vocational skills demonstrations. The next phase was to transcribe the data in Excel.

The data were analyzed by using qualitative content analysis (Mayring, 2000; Stemler, 2001) because it allows the categorization of textual data by themes, trends, and structures, enables the detection of similarities and differences, and enhances finding the essence of the phenomenon studied. As described above, the data for this study were collected in two semi-structured student interviews, free and confidential discussions separately with the student and his/her workplace learning instructor, and through observations during visits at the on-the-job learning firms, in order to obtain deep understanding of the students' on-the-job learning: the different phases and factors affecting a successful workplace learning period. The logic of the qualitative data analysis was to examine the research material from different classification grounds (the

inductive research approach). Though extant theories and the researcher's experience are the starting points for the researcher's preliminary understanding and conceptualization of the phenomenon, the research material may change these presumptions. The data were studied carefully and repeatedly (the hermeneutic approach) during the analysis process.

The data analysis was conducted in Excel. The classification of the data occurred in cycles by constructing six Excel tables with different classifications. The first table classified the material from the first semi-structured interview by the theme, the student, and the grade of the vocational skills demonstration. The second Excel table organized the data from the second semi-structured interview by the themes, the student, and the grade. The workplace instructors' free comments were also gathered in the second table by the student, the grade, and the on-the-job learning firm. The third table classified the main overall observations of the meetings at the workplace by the first and second meetings, the firm, and the student. In this table, the received grade was typed next to the student description. The fourth table provided a more detailed classification of the observations from the first meeting at the workplace by the on-the-job learning firm, observations regarding the workplace instructor and observations concerning the student (what was said and/or done). Again, the student's grade was related to him/her. The fifth table organized the observations from the second workplace meeting by the firm, the student, and the workplace instructor and again, the grades were related to the students. The sixth table combined the workplace instructors' free comments from the first meeting at the beginning of the on-the-job learning and the second meeting at the end of the period, organized by firm. The tables allowed comparison of the students' on-the-job learning periods by various classifications. Furthermore, this type of classification and comparison helped to gather the students' and workplace instructors' perspectives. The tables were studied several times by highlighting and bolding, for example, the similarities and differences among the excellently, moderately, and poorly successful students and comments/observations that were repeated in the research material. The tables developed during the analysis process when the researcher returned to a table or to the notes and constructed tables further by, for example, adding a classification or supplementing with further data. The tables constructed through different classifications and comparisons between them created a deeper understanding of the students' on-the-job learning by each cycle because they provided different perspectives, completed each other and enhanced the detection of connections between the classifications.

In qualitative research, the issues of validity and reliability are not straightforward and there is a lack of unanimity concerning which methods to use. Johnson (1997) discussed the following types of validity regarding qualitative research: 1) descriptive validity: accuracy in reporting descriptive information about events, objects, behaviors, people, settings, times, and places (Johnson, 1997: 285), 2) interpretive validity: the degree to which the researcher accurately understands the research participants' viewpoints, thoughts, feelings, intentions, and experiences, and portrays them in the research report (Johnson, 1997: 285), 3) theoretical validity: the degree to which a theoretical explanation developed from a research study fits the data indicating credibility and defensibility (Johnson, 1997: 286), 4) internal validity: the degree to which the researcher is justified in concluding that an observed relationship is causal (Johnson, 1997: 287), and 5) external validity: the generalization of the research findings (Johnson, 1997: 289).

This study adopts an inductive research method and it is exploratory in nature because it examines a less well understood area of the vocational students' on-the-job learning. Hence, the internal validity criterion is not relevant in this study. The Finnish vocational students' on-the-job learning is an established procedure regulated by the Finnish National Board of Education (including the assessment criteria for the vocational skills demonstration). This helps to ensure descriptive validity because the structure of the students' on-the-job learning period is the same; for example, the meetings between the workplace instructors, students, and teachers include certain elements, and the assessment objectives of the vocational skills demonstration are the same for all students. The established procedure facilitated the researcher's work in writing down observations accurately during the meetings. When considering the interpretive validity, the notes were written down using the participants' own exact words and expressions. It was possible to ask further questions and engage in discussion with the informants in order to ensure correct understanding. Theoretical validity is met because there is a clear relationship between the results of the study and the structured model of the students' workplace learning model (Article 4), and the contributors found to be necessary for construction of a successful on-the-job learning period (Article 5). In addition, the results were in line with the theories and conceptions related to workplace learning in previous studies. Regarding the fifth criterion of external validity, the standardized practice of on-the-job learning periods enhances the generalization of the results of this study to other Finnish vocational students' on-the-job learning, but statistical generalizations were not the goal of this study. Interest was focused on the comparison of single cases of the students' on-

the-job learning period. The generalization of the results across countries is not possible due to different VET systems and related students' on-the-job learning.

A general definition of reliability in terms of the ability to produce the same research results repeatedly (Stenbacka, 2001) is problematic in qualitative research in which the researcher has a crucial impact. It has even been suggested that instead of the traditional reliability criterion it is important for qualitative research to provide a profound description of the entire research process (Stenbacka, 2001). The present study describes thoroughly how and when the multiple types of data were collected, what the data collection methods were, and the procedure of the data analysis.

The fact that the researcher was familiar with the Finnish VET and on-the-job learning system helped in gathering data and observing situations that often proceeded rapidly and were characterized by a hasty atmosphere. Knowledge about the vocational students' on-the-job learning helped in quickly grasping the branch-specific jargon used in the meetings. In private discussions with the student and workplace instructor, it was an advantage that the researcher could understand terms and concepts used by the participants and relate them to on-the-job learning. Familiarity with on-the-job learning might cause problems; however, if the researcher is not able to enter the meetings at the workplace and analyze the data with an open mind. The researcher could not consider personal theoretical knowledge and practical experience about the subject to be a starting point for the analysis of the data. It was important to listen to what the students and workplace instructors said and write it down as it was spoken. Furthermore, in analyzing the data it was crucial to let the student's and workplace instructor's voice be heard instead of inserting the researcher's views of on-the-job learning. In other words, the researcher had to make a conscious distinction between her own understanding and the views of students and workplace instructors regarding on-the-job learning. From the viewpoint of trustworthiness of the study it was important that the researcher was aware of and could recognize the effects of her background and experiences regarding the phenomenon studied and could separate them from the participants' perspectives.

The theoretical and conceptual framework of this study discussed the concept of on-the-job learning in general as well as the students' workplace learning. Furthermore, the section that covered the key concepts of the present study represented how workplaces function as learning environments and described the on-the-job learning system of the Finnish VET. Thus, the study related the vocational students' on-the-job

learning to a real-world context where workplace learning actually occurs. Collection of the research material has been carefully described. The analysis section explained how understanding of the students' on-the-job learning developed through different classifications of the research material. It has been emphasized that the starting point in the analysis was the viewpoints of the students and workplace instructors. However, it should be noted that the researcher created the findings and interpretations from the research material through analysis, meaning that the researcher was involved. The sample size of this study has been justified by the diversified data collection methods, producing rich data about a single student's on-the-job learning period and by securing the continuation of the study even if the sample size should decrease during the research for unexpected reasons. The analysis of the study evolved cyclically by frequent returns to the research material during the classification design; thus the original research material and the analysis were very closely related. The researcher's ability to check understanding of the student's and workplace instructor's viewpoints during the semi-structured interviews and private discussions supported the authenticity of the study.

4. A SUMMARY OF THE ARTICLES AND RESULTS

This section provides a summary of the results of the articles, first individually and then in synthesis, to present the results of the whole study. Articles 1 and 2 examine how a collection of individual and/or organization-related factors influence the students' professional skills development from the students' perspective, which is not well understood in the extant literature, and the relationships between the factors. The purpose of Article 2 is to deepen understanding of the organization-related factors found to have a strong positive effect on the students' workplace learning in Article 1. Article 3 studies how organization- and individual-related factors that the vocational students consider important for their on-the-job learning are related to the workplace instructors' viewpoints of the students' performance during the on-the-job learning period and the formal grade given for the vocational skills demonstration. The study stems from the interest of contemporary firms and vocational institutions in the students' on-the-job learning, but there is little knowledge of how the perspectives of the different agents participating in workplace learning are associated to each other. Article 4 examines the different phases of the Finnish vocational students' on-the-job learning. Article 5 identifies factors that contribute to the construction of the vocational students' successful on-the-job learning period. These articles are inspired by the fact that the vocational students' on-the-job learning is an important part of VET systems in different countries.

4.1 Article 1: Vocational students' perspective on professional skills workplace learning

Background and objective

Workplace learning has become important for contemporary organizations (Felstead et al., 2010; Lans et al., 2008) due to its ability to enhance the acquisition of new profession-related knowledge (Clarke, 2005). Specifically, students' on-the-job learning is considered crucial because the acquisition of professional skills requires learning through work (Collin & Tynjälä, 2003). There are only a few studies examining the junior professionals workplace learning (Tynjälä, 2008; Virolainen, 2007) and even less literature concentrating on the factors that influence vocational students' on-the-job learning (Virtanen et al., 2014). In order to increase understanding of this issue, Article 1 provides a statistical study of the individual- and organization-related factors that, from the vocational students' perspective, affect the development of professional skills during on-the-job learning, their effects on the development, and their mutual relationships.

Results and contribution

This article is connected to the less-studied fields of newcomers' workplace learning (Tynjälä, 2008; Virolainen, 2007) and vocational students' workplace learning. The present study contributes by combining a large and diversified set of organization- and individual- related factors suggested to enhance the workplace learning of vocational students. It examines four categories of factors that are considered important for the vocational students' development of professional skills during on-the-job learning: 1) cognitive factors, 2) the students' attitudinal inclinations, 3) self-motivational drives, and 4) organization-related factors. The study proposes hypotheses about the effects of these factors on the students' development of professional skills in the context of workplace learning and then conducts a statistical examination of the effects proposed.

The results of this study are based on data gathered with a survey questionnaire. The questionnaire was sent to 600 graduating Finnish vocational students, and the quantitative empirical test was conducted using 285 students' responses. The response rate for the survey was 48. The study was undertaken by sending the students an internet-based questionnaire via email right after their final on-the-job learning period. The data were analyzed with the help of the confirmatory factor analysis and structural equations using LISREL 8.80.

The study implied the following main results. Firstly, the results do not indicate that the students' prior work experience in the industry studied (including regular tasks in the specific industry) positively affected the development of their professional skills. In fact, the relationship between these two was statistically insignificant, contrary to the findings of previous literature (Anakwe & Greenhaus, 2000; Tsai & Tsai, 2005). This result may be explained by the students' relatively short periods of previous work experience. The background information gathered from the students showed that a total of 74 percent of the respondents had prior work experience from the industry studied, performing typical tasks over periods between one and six months in length. The short work experience from the industry studied may not have been enough to help the students acquire concepts, mental models, and skills needed to enhance their professional skills development during the workplace learning period (Payne et al., 2002; Tsai & Tsai, 2005). Another explanation may be that work experience from a specific industry does not necessarily result in the gain of knowledge required in that industry (Quiñones et al., 1995) thus suggesting that the students' short work experience does not provide knowledge that positively impacts their curriculum-regulated workplace learning during studies.

Secondly, the results of this article confirmed those of previous studies (Halbesleben & Clark, 2010; Sulu et al., 2010) in that a student attitude indicating work alienation affects development of professional skills negatively. Thirdly, the motivational factors in terms of performance orientation and self-efficacy had a positive impact on the students' development of professional skills, which is in line with previous studies (Chen et al., 2001; Sujan et al., 1994). Fourthly, as expected (Dornan et al., 2007; Grealish & Ranse, 2009), the organization-related factors, including guidance, the psychological climate, and knowledge transfer, had a substantial positive effect on the students' development of professional skills during on-the-job learning. Furthermore, the results indicated a negative relationship between the organizational factors and work alienation suggested in the literature (Miller, 1967; Sulu et al., 2010). This is an interesting result because it implies that guidance, workplace instructors' actions, and senior support may mitigate the students' work alienation. The results show that organizations are in a key position regarding the vocational students' on-the-job learning. Specifically, the study reveals the workplace instructors' substantial impact, as they are responsible for the students' guidance.

4.2 Article 2: Vocational students' perspective on organizational factors enhancing workplace learning

Background and objective

Workplace learning is a key issue for organizations because it enhances the employees' acquisition of up-to-date and required professional skills (Kynd et al., 2009; Thurgate & MacGregor, 2009). The literature has shown increased interest in workplaces as learning environments, which has raised the question of how workplaces function as the students' learning spaces (Dymock & Gerber, 2002). However, most previous studies have primarily focused on factors that facilitate or hinder workplace learning among employees from various professions (Crouse et al., 2011; Hicks et al., 2007). There are only a few studies examining organizations as the students' learning environments. (Tynjälä, 2008; Virtanen & Tynjälä, 2008; Virtanen et al., 2014). The objective of this study is to examine a larger set of organization-related factors promoting the vocational students' on-the-job learning from their perspective. Studying these factors separately from other factors related to the students' workplace learning is necessary in order to obtain more detailed knowledge regarding the crucial impact of organizations on the students' on-the-job learning (which was found in Article 1). This research is topical because of the tight economic situation and changing operational environment that firms and schools face (for example, substantial changes in funding system and criteria for funding in the near future), requiring reevaluation of different functions, including vocational students' workplace learning. The study provides a further perspective on organizational factors that result in more successful vocational students' workplace learning which benefits the students, firms, and schools.

Results and contribution

This article participates in the discussion on workplaces as the students' learning environments (Dornan et al., 2007; Collin & Tynjälä, 2003). It contributes to the literature by examining the effects of an innovative climate, guidance, interactions with seniors, autonomy on the students' development of professional skills during workplace learning, and their mutual relationships. Article 2 uses the same data as Article 1, based on material collected from 285 graduating Finnish vocational students after they had finished their final on-the-job learning period.

The results suggest that three organization-related factors affect the students' perceived development of professional skills: 1) an innovative climate, 2) the workplace instructors' guidance, and 3) interactions with

senior workers. The innovative climate, including encouragement to find new ways to solve work-related problems and develop one's own ideas was found to have a positive relationship with the students' development of professional skills, which is in line with previous studies (De Vries & Lukosch, 2009; Stone et al., 2007). According to the results, guidance from the workplace instructors that was focused on improving the students' work performance and quality of work together with a feeling of becoming more successful at work was positively associated with the students' development of professional skills. This confirms the results of previous studies (Kyndt et al*.,* 2009; Onstenk & Blokhuis, 2007). Finally, interactions with seniors were positively related to the development of professional skills, an expected result based on the literature (Billett, 2001; Virtanen et al., 2014).

In contrast to previous literature (Van Ruysseveldt et al*.*, 2011), this study did not find a statistically significant relationship between autonomy (being allowed to handle tasks from beginning to end by oneself, having control over the pace of one's work, getting responsibility, and having one's suggestions taken into account) and the students' development of professional skills. One plausible explanation can be that most academic literature has considered employee autonomy (Felstead et al., 2010; Singh, 1998) instead that of the students. Furthermore, this study found a strong positive association between guidance and autonomy, which is also found in the literature (Kim et al., 2009). In the context of the present study, the results suggested that the vocational students need the workplace instructors' guidance in order to gradually construct autonomy related to their professional performance through new aspects and various methods (van Gelderen, 2010) that they learn from their workplace instructors. The study emphasized seniors' impact on the students' on-the-job learning. The study also suggested that a structured plan made by managers for the students' on-the-job learning periods can make the workplace instructors' job easier. As a consequence, students are systematically provided with the required skills and firms secure access to skilled workers despite mass retirement and the increasing shortage of skilled workers This article contributes to the topical research area of workplaces as learning environments and adds to the discussion on successful workplace learning environments (Clarke, 2005) by examining the less-studied field of vocational students' on-the-job learning and by providing tools for firms and schools to improve the vocational students' on-the-job learning environment.

4.3 Article 3: Vocational students' workplace learning: A multilevel analysis of survey data from students, workplace instructors, and grade

Background and objective

Many significant agents of the modern society are interested in workplace learning. Firms need employees with up-to-date competence and continuous skills development (Noe et al., 2013), vocational institutions want to ensure that they can provide firms with skilled future workers (Illeris, 2003), and policy makers need competent citizens in order to meet social and economic requirements (Filliettaz, 2013). Furthermore, individuals want to acquire and develop professional skills in order to get and stay employed in volatile economic circumstances. Hence, it is useful to examine relationships between different viewpoints regarding successful workplace learning. Examining vocational students' on-the-job learning is important because profession-related skills are best acquired through performing daily tasks in authentic situations (Felstead et al., 2010). Furthermore, learning at work contributes to the learning of professional skills because on-the-job learning is seen as a pre-phase for students on the verge of starting their career paths (Nieuwenhuis & van Woerkom, 2007).

This study provides a multilevel analysis of vocational students' on-the-job learning, including three different perspectives. The first one includes organization- and individual- related factors that enhance workplace learning from the vocational students' perspective. The second perspective includes the workplace instructors' assessment concerning the students' professional performance during the on-the-job learning period. Third, the study includes a formal measure in the form of the grade that the students receive at the end of the workplace learning period, given for the vocational skills demonstration. The main objective of this study is to examine how organizational-and individual- related factors enhancing on-the-job learning from a student perspective are related to workplace instructors' assessment of successful workplace learning and the formal grade given for the vocational skills demonstration, As far as the author is aware, this type of research setting has not been used before in the context of vocational students' on-the-job learning.

Results and contribution

This study contributes to the field of vocational students' workplace learning (Nieuwenhuis & van Woerkom, 2007; Noe et al., 2013) by conducting a multilevel analysis with three different perspectives. It provides new and unique knowledge by examining how organization- and individual- related factors enhancing workplace

learning from the vocational students' perspective are related to workplace instructors' assessments of the students' professional performance during the on-the-job learning period, and the to the vocational skills demonstration grade measuring how well the students succeeded in gaining the professional skills required by working life. This study used the same data as Articles 1 and 2, collected from the Finnish vocational students between February and May 2012. The data were analyzed with the partial least square (PLS) SEM. The students' workplace instructors received an internet-based questionnaire via email right after their students had finished the final on-the-job learning period. The questionnaire was sent to 358 workplace instructors and 156 responses were received. After connecting responses received from the students to those received from their workplace instructors, 100 responses were left. The organizational factors and individual-related factors used in this study are based on the results of Article 1.

This study hypothesized that an innovative climate, knowledge transfer accuracy, senior colleague support, performance orientation, and self-efficacy were all positively associated with the workplace instructors' assessments and the vocational skills demonstration grades. The results partly supported the hypotheses. First, the results indicated that an innovative climate, knowledge transfer efficiency, and the students' performance orientation were significantly related to the workplace instructors' assessments. The presence of an innovative climate was positively related to the assessment, which is in line with previous studies (Köhler et al., 2010). Knowledge transfer inaccuracy measured in this study was negatively related to the workplace instructors' assessments, which also supported the results in the literature (Chan et al., 2014; Szulanski et al., 2004). The students' performance orientation was negatively associated with the workplace instructors' assessments, which did not support the research hypothesis. Previous studies have suggested that performance orientation (Kohli et al., 1998) may have positive effects on workplace learning, because it encourages a great deal of hard work (Sujan et al., 1994). The students' performance orientation means that they consider it important to obtain positive feedback from seniors regarding contemporary skills, and desire to make their competence visible to the seniors. In contrast, the workplace instructors assessed the students' professional performance, which requires individual initiative, persistence, and the performance of demanding tasks in order to develop. More specifically, the student's desire to prove his/her competence and receive positive evaluation of one's own ability may include a reverse side of showing less enthusiasm towards accepting challenging tasks and taking initiative, which the workplace instructors appreciated in their assessments of the students' professional performance during workplace learning period.

Second, the results showed that support from senior colleagues was positively related, and the students' self-efficacy was negatively related, to the grade for the vocational skills demonstration. Again, the results partly supported the study hypotheses. Senior colleague support was measured through close relations and frequent interaction with seniors in the workplace learning firm which, according to previous studies, contributed to the acquisition of relevant knowledge (Levin & Cross, 2004) and enhanced the transfer of tacit knowledge (Zhou et al., 2010). Hence, the result supported the study hypothesis as well as previous findings. Self-efficacy is considered to enhance motivation to learn, work performance, and learning skills (Bryson et al., 2006). The negative relationship between the students' self-efficacy and the grade was interesting and may be explained by the phenomenon of over-efficaciousness (Jernigan, 2004), which has been shown to decrease learning motivation. It is possible that the students had generated an excessive level of self-efficacy because they did not have sufficient real-life experiences from the profession studied and thus, could not know how demanding the vocational skills demonstrations would be. In sum, the students may have considered themselves "too good" without realistic reasons; facing the reality of the demonstration may have lowered their performance level. This study contributed by identifying how the organization- and individual-related factors that vocational students considered to enhance their workplace learning were related to the workplace instructors' viewpoint, based on the students' competence and the formal grade. This knowledge is needed when developing vocational students' workplace learning under changing and challenging conditions so that all parties benefit.

4.4 Article 4: How are professional skills acquired? A structured process of on-the-job learning

Background and objective

Population ageing and a lack of skilled labor have become concerns for many modern organizations. In addition, there is a threat that the employees' quality of education and experience may deteriorate in the future (Jorgenson et al., 2008.) The key question is how organizations make sure that the essential skills of present professionals are conveyed to future professionals. This has increased interest in workplace learning (Billett, 2001, 2004; Cheetham & Chivers, 2001a, 2001b; Collin & Tynjälä, 2003). Previous literature in the field of profession-related workplace learning has mostly concentrated on adult learning and performance improvement for experienced professionals. Less attention has been paid to the future professionals' learning of professional skills in authentic environments at a pre-stage of their careers. The purpose of this

article is to examine the Finnish vocational students' on-the-job learning at the end of their VET studies in order to identify its key phases and characteristics. Another goal of the study is to increase understanding of how the students and workplace instructors, for their part, influence the different phases of the on-the-job learning in order to enhance the students' professional performance.

Results and contribution

Article 4 contributes to the ongoing discussion of employees' workplace learning (Billett, 2004; Cunningham & Hillier, 2013; Engeström et al.,1995) by providing the vocational students' and workplace instructors' perspectives on the most important phases of the students' on-the-job learning aiming to professional performance before entering the labor market. The on-the-job learning periods of 20 graduating Finnish vocational students, with 14 workplace instructors, were examined in order to build a structured model of on-the-job learning. The results suggested that the students' learning process consists of three successive phases on the way towards professional performance: 1) the basic level, including orientation at the on-the-job learning firm, tasks, and an opportunity for a student to show his/her capabilities and positive attitude towards work, 2) the intermediate level of learning the core professional performance by performing daily tasks in an authentic environment, and, finally, 3) the professional level, indicating the student's personal way to perform profession-related tasks and use work methods. Furthermore, the model suggested that prior knowledge that the students have when entering the on-the-job learning period enhances the learning of new knowledge (Sutherland, 1999) because, according to the results, the workplace instructors required that the students have very basic professional skills and understanding of the general rules of work life.

The results showed that the key characteristics of the students' on-the-job learning period are individual activity, critical observation of the seniors' performance, conscious doing, and creativity, indicating that individuals learn new skills by doing (Spender, 2006) and through experience (Dymock & Gerber, 2002). In addition to the students' impact, the study found organizational factors related to the students' on-the-job learning, such as workplace instructors' guidance, the provision of relevant tasks for the students, the monitoring of their development, and the creation of an atmosphere to enhance the development of professional performance. The structured on-the-job learning model contributes to the emerging discussion on knowledge sharing across generations in organizations. The model helps organizations to understand how workplaces and students together can enhance the juniors' professional performance. More generally, it

identifies the most important phases of the students' workplace learning from the individual and organizational points of view. This is crucial knowledge for firms that want to ensure their access to qualified professionals now and in the future.

The study takes a closer look at the Finnish vocational students' on-the-job learning examined in the quantitative articles of this study by building a structured model of its phases. Article 4 relates some individual- and organizational-related factors discussed in Articles 1, 2, and 3 to these phases. For example, the results suggested that the workplace instructors pay attention to the students' having the right attitudes towards work and the ability to demonstrate the current level of their skills, especially during the orientation period. The results indicated that active students demonstrating willingness to learn and initiative (showing willingness to participate in work life) were likely to get diversified and challenging tasks. As another example, the results of this article related the firms' ability to provide the students with relevant work experience (discussed in Article 1) to the second phase of the students' on-the-job learning model. Furthermore, the study suggested some interesting differences between the students. For example, the data implies that challenging and more advanced tasks are given to alert students, and excellently successful students tended to describe new things they learned in terms of processes, whereas less successful students described newly-learned things through details of specific tasks. This suggests that there is a need to examine the factors that are common to highly successful students.

4.5 Article 5: Exploring the contributors of successful development of professional skills during workplace learning periods

Background and objective

Contemporary firms are not able to function efficiently and successfully without being flexible and having a readiness to renew (Teece et al., 1997; Kianto, 2008). Operating in an environment that demands rapid action from firms also requires workers' continuous acquisition of new and updated profession-related skills and knowledge. The literature considers workplace learning an effective means for this type of knowledge creation (Clarke, 2005). Firms that can provide employees with an environment that supports workplace learning get a head start in competition with other firms. The identification of factors that enhance employees' workplace learning is a key to maintaining a competitive position. Workers' learning at work is a rather extensively studied field (Fenwick, 2008), and there are some studies concerning the novice

professionals' workplace learning (Guile & Griffiths, 2001), but there is little knowledge of factors that affect the vocational students' on-the-job learning (Cronin, 2014) during their VET studies. The purpose of this article is to examine the elements of the Finnish vocational students' successful on-the-job learning by using qualitative data from the students' on-the-job learning periods.

Results and contribution

The results of this article are based on the same data used in Article 4. It included 20 graduating Finnish vocational students and 14 workplace instructors. Some workplace instructors in this research had up to three students under their supervision, not unusual in the Finnish VET system. To obtain a profound understanding of the students' on-the-job learning based on authentic perspectives (Yin, 2009), the study adopted a comparative multiple-case study method where a case is a single student's on-the-job learning period, enabling comparison between excellently successful and less successful students. The rich data was gathered through participation in meetings between the student, the workplace instructor, and the teacher at the beginning and end of the on-the-job learning period, semi-structured interviews with each student, private discussion with the student and his/her workplace instructor separately, and the researcher's observations and notes made during the visits to the firms.

The results suggest that both workplace instructor-related factors and factors related to the students contribute to successful on-the-job learning. First, feedback (Hurley, 2002) from the workplace instructor right from the beginning of the workplace learning period proved to be one success factor for those students who performed excellently. According to the findings, feedback from seniors, whether positive or advisory, encouraged the excellently-successful students to comment on their skills or performance at the time. It was demonstrated to be important for the students to get feedback during the entire on-the-job learning period, in order to know whether they were proceeding in the right direction in doing daily tasks. Second, it turned out to be important that the seniors provided opportunities for students to learn the overall management of work processes (Lantz & Friedrich, 2003). The results suggested that many less successful students had limitations in their knowledge about how certain work processes included in the vocational skills demonstration proceeded, while excellently successful students did not display this type of shortcoming. Third, the results showed that self-efficacy was characteristic for students with excellent performance (Gundlach et al., 2003). In contrast, there were many less successful students who expressed insecurity

regarding their work. Fourth, successful students tended to be proactive, which confirms the findings of previous literature suggesting that proactive behavior promotes work performance (Bakker et al., 2012). Proactive students had an active hold on work (Bryson et al., 2006) and they managed to acquire skills needed in order to manage everyday work situations. Fifth, excellently successful students tended to demonstrate initiative in learning (O'Donoghue & Maguire, 2005). Many workplace instructors specifically mentioned their overall willingness to learn and ability to learn quickly. This study contributed to the field of students' on-the-job learning by providing new knowledge of factors needed to construct a successful workplace learning period for vocational students. Specifically, it concretized the critical shortcomings related to the workplace learning period of less successful students and demonstrated how factors that were needed in order to construct a successful workplace learning period were manifested in the authentic workplace environment of vocational students. This article complements the results of the quantitative research in this study by deepening the students' and workplace instructors' viewpoint of a successful on-the-job learning period through comprehensive use of data collected in authentic situations.

4.6 A summary of articles and main contributions

Table 7 briefly presents the objectives, methodology and data, and the main contributions of the separate articles that form the dissertation. Individual articles focus on separate research objectives, and together they provide knowledge from different starting points of factors that contribute to the graduating vocational students' successful on-the-job learning at the beginning of their career paths. Articles 1 and 2 studied empirically how individual- and/or organization-related factors influence the students' on-the-job learning. Article 2 was focused on further examination of factors related to the workplace settings of the students' on-the-job learning firms, because Article 1 indicated the substantial importance of these factors regarding the students' perceptions of successful on-the-job learning. Article 3 examined how the students' point of view regarding successful workplace learning was related to that of the workplace instructors' and to the objective measure of the vocational skills demonstration grade. Article 4 constructed a structured model of the vocational students' on-the-job learning period and identified the key characteristics of it. Article 5 compared the graduating vocational students' on-the-job learning periods in order to find factors that contribute to the formation of a successful on-the-job learning period.

Table 7. A summary of the articles and their main contributions to the dissertation

Article	Objective	Methodology and data	Main contribution
Vocational students' perspective on professional skills workplace learning	To identify individual- and organizational- related factors affecting the vocational students' development of professional skills during on-the-job learning from the students' perspective and examine their relationships	Quantitative survey study: data gathered from 285 graduating Finnish vocational students	Statistical examination of the effects of cognitive, motivational, organization-related, and attitudinal factors on the vocational students' development of professional skills during on-the-job learning Identifies the workplace instructors' and other seniors' strong positive impact on the students' on-the-job learning
Vocational students' perspective on organizational factors enhancing workplace learning	To examine in detail how a larger set of organization-related factors affect the vocational students' development of professional skills during on-the-job learning and their relationships	Quantitative survey study: data gathered from 285 graduating Finnish vocational students	Statistical examination of the effects of an innovative climate, guidance, interactions with seniors, and autonomy on the students' development of professional skills during on-the-job learning. Provided knowledge of organization-related factors that can be used and developed to enhance the students' workplace learning
Vocational students' workplace learning: a multilevel analysis of survey data from students, workplace instructors, and grade	To examine the relationship between the students' perceptions of factors enhancing on-the-job learning, workplace instructors' assessment of the students' professional performance, and the formal grade given to the vocational skills demonstration	Quantitative survey study: data gathered from 100 graduating Finnish vocational students and workplace instructors	Identifying similarities and differences among factors that the students' considered to contribute workplace learning, the workplace instructors' viewpoints, and the formal grade. Suggested ways to improve and develop the vocational students' on-the-job learning so that the students, workplaces, and vocational institutions benefit
How are professional skills acquired? A structured process of on-the-job learning	To examine the structure and key characteristics of the vocational students' on-the-job learning	Qualitative study based on semi-structured interviews, private discussions, meetings at the workplace, notes and	Creation of a structured model of the vocational students' on-the-job learning period: identification of key phases including the orientation period, the phase of actual learning of professional performance, and the phase where the student is able to perform professionally as a full member of

		obser-vations: data gathered from 20 graduating Finnish vocational students and 14 workplace instructors	work community
Exploring the contributors of successful development of professional skills during workplace learning periods	To identify factors that contribute to the vocational students' successful workplace learning period	Qualitative study (comparative case study) based on semi-structured interviews, private discussions, meetings at the workplace, notes, and obser-vations: data gathered from 20 graduating Finnish vocational students and 14 workplace instructors	Provided new knowledge about the vocational students' on-the-job learning contributors when they are starting their careers, identified success factors of the students' on-the-job learning period: feedback from seniors enabling the students to learn the overall management of work and work processes, the students' self-efficacy, proactive behavior, and individual initiative regarding learning

5. DISCUSSION AND CONCLUSIONS

The main goal of this study was to discover the key contributors to vocational students' on-the-job learning during VET studies. The study contributes to the literature of workplace learning in four ways. First, the study provides empirical evidence on the individual- and organization-related factors that enhance the vocational students' on-the-job learning of professional skills from the students' perspective. Second, it provides an empirical examination of the relationships between the vocational students' perspective, the workplace instructors' viewpoint, and the grade given for the vocational skills demonstration. Third, it builds a structured model of the vocational students' on-the-job learning period and identifies the key phases and characteristics of it. Fourth, the study provides a comprehensive examination of contributors that help to construct a

successful on-the-job learning period, based on data collected from authentic situations during the students' on-the-job learning.

5.1 Answering the research questions

The main research question of the study was formulated as follows: "How can the on-the-job learning of vocational students be enhanced?" It was made more specific by the addition of three sub-questions. The first sub-question "What are the factors, from a student perspective, that positively influence vocational students' on-the-job learning?" According to the findings, the factors enhancing the students' on-the-job learning of professional skills can be divided into three categories: the students' attitude, self-motivational drives, and the organization-related factors of perceived usefulness of guidance, psychological climate, and knowledge transfer. It was shown that the organization-related factors substantially enhanced the students' development of professional skills. Thus, a further study focusing solely on the organization-related factors was considered necessary. The results revealed that an innovative climate, the workplace instructors' guidance, and interactions with seniors were the key factors enhancing the students' learning.

The second sub-question was "How the relationship between the factors that vocational students consider to enhance on-the-job learning and assessments from workplace instructors differs from the relationship between these factors and formal grade?" The results of a multilevel analysis suggested that among the factors the vocational students considered to enhance on-the-job learning, innovative climate, knowledge transfer accuracy, and the students' performance orientation were significantly related to the workplace instructors' assessments, whereas senior colleague support and the students' self-efficacy were significantly associated with the grade given for the vocational skills demonstration. Hence, none of the organization- and individual-related factors that the vocational students considered to enhance their workplace learning were related to both the workplace instructors' assessment and the grade.

The third sub-question was "What factors differentiate the on-the-job learning period of highly successful students from less successful ones?" First, a study identifying the structure of the vocational students' on-the-job learning period was conducted. The purpose of the study was to serve as a basis for a further examination of successful on-the-job learning period construction. According to the findings, there are three successive phases in the students' on-the-job learning period: the basic (orientation), intermediate (doing daily tasks), and professional levels (performing like the professionals in a certain industry). In addition, the

study identified a set of individual and organizational factors that are required for successful on-the-job learning. The individual-related factors were related to the students' activity, critical observation of the seniors' performance, conscious performance of tasks, ability to receive instructions, willingness to learn, and creativity. The organizations are required to provide the students with guidance, relevant tasks and experiences, keep track of the students' development, and provide a beneficial atmosphere for professional learning. Second, a study based on data acquired from the vocational students' on-the-job learning period was conducted. The results suggested that factors related to the workplace learning period of highly successful students were feedback and the provision of opportunities to learn the work processes on the seniors' part, and self-efficacy, proactive behavior, and initiative in learning on the vocational students' part.

5.2 Theoretical contribution

The main theoretical contribution of this study related to the field of workplace learning is discussed in this section. Specifically, this study makes a theoretical contribution to research on workplaces as supportive learning environments, and factors that are related to individuals and are assumed to positively affect workplace learning, in examining a wide and versatile range of these factors from the vocational students' perspective. There is a large number of studies concerning the supportive workplace learning environment from the employee point of view (Trede et al., 2013) and some studies considering the novice professionals' (Filliettaz, 2013) perspective, but very few scholars have studied the vocational students' perceptions of successful on-the-job learning environment (Virtanen et al., 2014). Furthermore, there is not enough knowledge of student-related factors that affect successful workplace learning during VET studies. It is important to examine and identify contributors to the vocational students' successful workplace learning because it is considered an effective way to learn professional skills, especially in terms of enabling knowledge sharing between seniors and juniors (Nieuwenhuis & van Woerkom, 2007).

This study identified factors that positively affect, from the student perspective, vocational students' on-the-job learning. It examined the traditionally-studied organization-related factors (Trede et al., 2013) and the equally important but less-studied (in context of vocational students) student-related factors such as work alienation (Brookfield & Holst, 2011) and self-efficacy (Noe et al., 2013). According to this study, there are several factors related to the workplace learning setting that influence successful workplace learning from the vocational students' point of view. Among these are 1) guidance perceived to improve the students' work

performance, helped to make the students more successful, and improved the quality of their work, 2) a workplace instructor that provided orientation to the student at the beginning of the on-the-job learning period, was responsive to the students' requests for help, and noted the students' good work, 3) seniors that supported the students' efforts to acquire work experience, 4) interactions with seniors perceived to have a positive effect on the students' professional growth, attitudes, and interest towards the industry studied, and made them feel like a member of the work community, 5) an innovative climate at the on-the-job learning firms, seen, for example, in encouraging students to find new ways around problems and in developing the students' own ideas, 6) a workplace learning setting that allowed the student to handle tasks from beginning to end by him/herself and to have control over the pace of his/her work, gave responsibility to the students, and took into account their suggestions, and 7) senior colleagues who were available when the students needed advice. The results suggested that the workplace learning settings provided by the students' on-the-job learning firms extensively and strongly contribute to the students' successful on-the-job learning period, seen from the student perspective.

Previous literature has recognized managers' substantial impact on effective workplace learning (Confessore & Kops, 1998; Li et al., 2009) as motivators and enablers of development (Bryson et al., 2006), enhancing workplace learning through a profound understanding of the learning process (Lehesvirta, 2004) and displaying a positive attitude towards workplace learning (Turner et al., 2006), and as enablers of knowledge sharing and access to knowledge (Mumford, 1992; Lehesvirta, 2004). This study showed that workplace instructors and other seniors had a central impact on the vocational students' successful on-the-job learning. More specifically, it provided new knowledge of the specific characteristics of the workplace instructors' and seniors' actions which contributed to the vocational students' successful learning at work.

In addition to contributors related to the workplace learning setting, this study examined how some individual-related factors, such as self-motivational drives, including performance orientation (Kohli et al., 1998), self-efficacy (Downey & Zeltmann, 2009; Gundlach et al., 2003), attitudinal inclinations in form of work alienation (Ceylan & Sulu, 2011), and cognitive models concerning previous work experience (Payne et al., 2002; Tsai & Tsai, 2005), affect vocational students' successful on-the-job learning. Among the individual-related factors, the vocational students considered 1) performance orientation, indicating the importance of positive evaluation regarding current performance from seniors and effort-orientated performance in terms of hard work, and 2) self-efficacy concerning positive beliefs about the students' ability to handle and manage

tasks given to them, to positively affect their on-the-job learning. The study showed that if the seniors succeeded in the actions discussed above, they were able to decrease the students' possible work alienation, shown as reluctance to participate in work life (Hirschfeld, 2002; Hirschfeld & Feild; 2000), and detachment from work roles (Ceylan & Sulu, 2011; Hirschfeld, 2002; Nair & Vohra, 2010). This is an important finding, because a positive attitude towards work and working life is needed in order to successfully complete the on-the-job learning period and thus learn core skills related to the future profession. In sum, this study contributed to the field of workplace learning by providing new knowledge on student-related factors as well as factors related to the vocational students' on-the-job learning organization that, from the student perspective, enhanced their successful learning period.

5.3. Managerial implications

For managers, this dissertation provides a means to prevent or mitigate the problem of a shortage of competent employees faced in many industries due to the retirement of the baby boom generation (Koc-Menard, 2009; Thibodaux & Rouse, 2005), and the fact that there are more old people than children and working-age population in most advanced economies. The vocational students' workplace learning gives an excellent opportunity for managers to ensure that the present professionals' skills are conveyed to the juniors who are about to enter the labor market, and that these skills are up-to-date. The experienced professionals often possess tacit knowledge (Smith, 2001) that is difficult or impossible to convey explicitly. In this respect, the vocational students' on-the-job learning under the seniors' guidance and the observation of their performance is an effective tool to learn this type of knowledge. More importantly, the seniors can concentrate on training successors and the managers can get to know the best potential of their future professionals. Thus, seeing the vocational students' workplace learning as preparing future employees for their jobs would have a positive impact on the success and competitive advantage of firms in the sense that the newcomers are more ready to perform effectively from the beginning of their careers. This benefits individuals as well because the students acquire relevant skills that help them to get employed after finishing VET studies.

In terms of management implications, this study showed that the organizations indeed have a substantial effect on the vocational students' workplace learning. The impact of the learning environment provided by the organizations on workplace learning has been identified in many previous studies (Cheng & Wang, 2012;

Matthews, 1999), and this dissertation suggests that it is even more important in the case of vocational students because they are very dependent on the firms where they perform their workplace learning. This emphasizes the managers' need to pay attention to the learning environment provided for the students in terms of appropriate guidance, an innovative climate, and good relationships between the students and seniors. In particular, the managers should recognize the workplace instructors' and other seniors' substantial influence on the students' professional skills workplace learning by mentoring the employees who guide the vocational students to encourage the provision of successful guidance. This should be done together with vocational institutions in order to meet the educational requirements and requirements of organizations that face constantly-changing operational environments and occupational requirements.

By mapping the present and future professional skills requirements, firms are able to detect possible gaps in the current workers' skills and plan how to maintain, update, and develop them. When the firms are aware of these upcoming challenges, they are able to influence the future employees' professional skills development in the desired direction by providing the vocational students with relevant tasks and knowledge during on-the-job learning. Furthermore, the managers should design a detailed plan for the students' workplace learning periods. To implement the plan successfully, the managers need to ensure that the workplace instructors and other seniors are motivated to follow it. The employees can be engaged and supported through constructing a concrete practice, for example, by making a process flowchart of the students' workplace learning, including the key phases and times of implementation as well as the managers, workplace instructors, and other seniors' task descriptions and responsibilities. Furthermore, it is important that the managers plan the workplace instructors' work in advance in order to provide sufficient resources for the students' guidance without neglecting or disturbing regular work and to increase their commitment to their role as workplace instructors. This means that the managers must plan the workplace instructors' work shifts, business trips, employee training, and vacations in advance to fit the students' workplace learning periods.

Managers in vocational institutions, who are the teachers' supervisors and are responsible for practical planning and implementation of education and projects, should work in tight cooperation with the firm managers and workplace learning instructors in order to help organizations reach the goals of the vocational students' on-the-job learning. For example, the schools could organize continuous training specifically designed for the workplace instructors and events around topics related to the students' workplace learning.

5.4 Implications for vocational institutions and policy makers

In Finland, the vocational students' on-the-job learning is an established part of VET studies. However, there have recently been pressures to develop this established system (Cedefop, 2012). For example, some students benefit from extended on-the-job learning during the studies because they learn better by doing than at school. Some vocational qualifications have introduced a longer on-the-job learning than required in order to ensure sufficient practical skills for the students. Some vocational institutions have introduced the so called two plus one model, where the vocational students participate in normal VET studies according to curricula for the first two years and the last year is performed through an apprenticeship contract in a firm representing the branch studied. An initial need to introduce such a model was due to a good employment situation in some branches, attracting vocational students to working life, although the studies were unfinished. An apprenticeship contract means that a student and firm make a work contract and a student gets paid for his/her work. Furthermore, the so-called Germany model, which includes a substantial amount of apprenticeship-type learning during VET studies and a scheduled model for theoretical learning and working with salary, has awakened interest among policy makers in Finland because it is seen to decrease unemployment and prevent the social exclusion of young people. It is recognized that the contemporary Finnish apprenticeship system needs to be changed (CIMO, 2010) because it cannot meet new challenges from policy makers, schools, students, and firms.

When vocational students' on-the-job learning faces pressures for change, searches for new and alternative forms, and becomes an increasingly important part of VET studies, it is necessary to understand which elements make up the vocational students' successful on-the-job learning period. One goal of the present study was to examine this subject in terms of contributors to the students' successful workplace learning. For vocational institutions and policy makers, the results of this study provide knowledge of the construction of the vocational students' successful on-the-job learning, based on the students' and workplace instructors' perspectives. Furthermore, it provides a basis for continuous development of the students' learning at work during VET studies. It turned out that the students' successful on-the-job learning requires feedback (Hurley, 2002; Tynjälä, 2008) from seniors from the beginning of the period in order to guide the students' learning and encourage their own thinking regarding current skills and the performance of tasks. Furthermore, it is very important for the students' success that the seniors provide opportunities to learn mastery of entire work processes (Lantz & Friedrich, 2003) typical for a specific branch and profession. Vocational institutions

should create instructions and practices of the students' on-the-job learning that clearly express the importance of the seniors' continuous feedback for the students and the very important issue of ensuring that the students learn to handle entire work processes. They should encourage the seniors to give feedback and the students to receive and ask for it. Vocational institutions should add items to their regular information collection system regarding feedback given and received, its effects on the students' professional skills learning and performance of daily tasks, and the students' abilities to master central work processes. The responses received should be discussed with the firms, the students, and the teachers in order to decide on concrete development actions. In addition, vocational institutions should instruct the teachers responsible for on-the-job learning periods and the workplace instructors to check during the period that the students' mastery of the most important work processes has begun and is proceeding as required.

The vocational students' impact in constructing successful on-the-job learning is emphasized when the students' learning through work increases. This study showed that the students' self-efficacy regarding their confidence in their ability to manage tasks given to them (Gundlach et al., 2003), proactive behavior shown in an active hold on work (Bakker et al., 2012), and the students' initiative in learning (O'Donoghue & Maguire, 2005), especially in terms of a willingness to learn and the ability to learn quickly, were positively related to a high level of success during the on-the-job learning period. This study emphasizes that it is important for vocational institutions and policy makers who are planning, implementing, and developing the vocational students' on-the-job learning to understand that the students actively participate in construction of successful learning at work. In developing the vocational students' workplace learning, policy makers and vocational institutions have to understand how to promote and nourish the student-related characteristics needed for a successful workplace learning period during vocational studies including education that occurs at school and in real working situations. These ideas could be included in qualification requirements and school-specific curricula.

5.5 Limitations and further research

This study has some limitations that should be noted. First, the study used the vocational students' self-appraisal in examining the factors that affected their development of professional skills during on-the-job learning. It was recognized that this approach is a possible source of problems with common method variance, but it was used in this study for two reasons. First, it seems to be a commonly-used method

(Virtanen et al., 2014) and, secondly, the study included factors that were difficult to measure otherwise, such as work alienation and self-efficacy. Furthermore, the graduating students were considered the best sources regarding their development of professional skills during the final on-the-job learning period. However, future research should examine the managers, other seniors, and teachers' viewpoints in order to study this field from various perspectives. These could include independent variables related to organizational procedures, and dependent variables such as the workplace instructors' assessments of the students' on-the-job learning period, from various perspectives and teachers' viewpoints. Second, the study included the workplace instructors' viewpoints in terms of assessment of the students' competence-related performance during the on-the-job learning period. However, future research should examine what the workplace instructors' and other seniors' skills are, related to the students' successful workplace learning. Third, the results of this study were based on the students' perspectives at the end of the workplace learning period. Future research could conduct a longitudinal study in order to detect possible changes in the students' learning of professional skills and the development of the on-the-job learning procedure.

Fourth, the researcher's contemporary knowledge about the field examined suggests that the studies would have benefited from closer cooperation with the students' on-the-job learning firms by examining the managers', workplace instructors', and other seniors' viewpoints in detail through, for example, surveys or interviews. This would have helped to better concretize how the firms benefit from investing in the students' on-the-job learning. For example, the firms may have the newest equipment and work methods that the schools cannot provide; thus the future workforce is provided with up-to-date knowledge and skills through on-the-job learning during VET studies.

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Appendix I

Professional skills are significant from the students', firms', and schools' viewpoints. This study examines the most important factors of professional skills learning. Your opinions and viewpoints are valuable in examining professional skills learning during on-the-job learning.

This questionnaire concerns your latest on-the-job learning period and opinions about work in general. Responses are handled confidentially. Answering will take 15-20 minutes.

Part1: Background information

1. Gender
2. Indicate your age here
3. The grade of the vocational skills demonstration received from the latest on-the-job learning period
4. The field studied
5. Vocational qualification studied
6. Previously taken degree/vocational qualification
7. Studies dropped out
8. At the beginning of the latest on-the-job learning period, I was provided with an orientation to the tasks:
   more than two days / a day / a couple of hours
9. Did you consider the length of the orientation period sufficient?
   Yes / no

Part 2: Work experience

The items below map your work experience from the branch studied and other branches, and the amount of work experience. On-the-job learning periods performed during vocational studies should not be included here.

10. Work experience from branch studied:
    no work experience / assisting at tasks / regular tasks / demanding tasks
11. Work experience from the branch studied: assisting at tasks (1-3 months, 4-6 months, 7-9 months, 10-12 months, more than a year, no work experience)
12. Work experience from the branch studied: regular tasks
13. Work experience from the branch studied: demanding tasks
14. Work experience from other branches:
    no work experience / assisting at tasks / regular tasks / demanding tasks
15. Work experience from other branches: assisting at tasks (1-3 months, 4-6 months, 7-9 months, 10-12 months, more than a year, no work experience)
16. Work experience from other branches: regular tasks
17. Work experience from other branches: demanding tasks

Part 3: Views and opinions about work and working in general

18. Think about your attitude towards work and working. Take a stance on the following items.

My work gives me a feeling of pride in having done the job well (Miller 1967).

I wonder why I should get a job after I have graduated (adapted from Hirschfeld and Feild, 2000. and Hirschfeld et al., 2000).

I very much like the type of work that I am doing (Miller, 1967).

No matter how hard you work, you never really seem to reach your goals (Hirschfeld and Feild, 2000, and Hirschfeld et al., 2000).

I find it difficult to imagine enthusiasm concerning work (Hirschfeld and Feild, 2000, and Hirschfeld et al., 2000).

My job gives me a chance to do the things that I do best (Miller, 1967).

Ordinary work is too boring to be worth doing (Hirschfeld and Feild, 2000, and Hirschfeld et al., 2000).

If you work hard enough, you are likely to make a good life for yourself (Arslan, 2001).

I feel little need to try my best at work, as it makes no difference anyway (Hirschfeld and Feild 2000, and Hirschfeld et al., 2000).

If you want to make something of your life, you will have to find a regular job (ter Bogt et al., 2005).

I find it hard to believe people who actually feel that the work they perform is of value to society (Hirschfeld and Feild, 2000, and Hirschfeld et al., 2000).

For the future, I can think of nothing better than getting/having a regular job (ter Bogt et al., 2005).

It is important to build a career for yourself (ter Bogt et al., 2005).

Life would be more meaningful if we had more leisure time (Arslan, 2001).

A regular job is the most important source of happiness (ter Bogt et al., 2005).

Work to me is more like a chore or a burden (Nair and Vohra, 2010).

Without a job, my future looks bleak (ter Bogt et al., 2005).

People should have more leisure time to spend in relaxation (Arslan, 2001).

I don’t enjoy work. I just look for a job to get paid (adapted from Nair and Vohra, 2010).

The most difficult tasks usually turn out to be the most rewarding (adapted from Arslan, 2001).

I feel uneasy when there is little work for me to do (Arslan, 2001).

Most people who do not succeed in life are just plain lazy (Arslan, 2001).

People who fail at a job have usually not tried hard enough (Arslan, 2001).

You can do useful things in your leisure time, but a regular job is more important (ter Bogt et al., 2005).

Hard work offers little guarantee of success (Arslan, 2001).

Part 4: Development of professional skills

19. Think about your latest on-the-job learning period. Take a stance on the following items concerning development of professional skills.

I am satisfied with the extent of my professional skills development since entering this on-the-job learning period.

My on-the-job learning period experience has had a positive influence on my professional growth.

I am satisfied with my work experience at this on-the-job learning period.

Few of my tasks during this on-the-job learning period have been professionally useful.

My interest in the industry has increased since coming to this on-the-job learning firm.

I am more likely to search for profession-related information (for example, professional magazines, websites, books, TV shows, discussions with professionals) now than I was before this on-the-job learning period.

I have performed professionally as well as I anticipated I would.

(All items are adapted from Pascarella and Terenzini, 1980.)

Part 5: The impact of the on-the-job learning firm on learning professional skills

20. Think about your latest on-the-job learning period and answer the following items.

My on-the-job learning firm

…encourages me to find new ways around old problems.

…encourages me to develop my own ideas.

…encourages me to improve upon its methods.

…talks up new ways of doing things.

…likes me to try new ways of doing things.

(All items are adapted from Stone et al., 2007.)

21. Think about guidance you received during your latest on-the-job learning period. Take a stance on the following items.

Guidance during this on-the-job learning period

…has improved my work performance.

…helped make me more successful.

…improved the quality of my work.

…helped me do a better job.

(All items are adapted from Stone et al., 2007.)

22. Think about interaction between you and the senior colleagues during your latest on-the-job learning period. Take a stance on the following items.

My interactions with seniors have had a positive influence on my professional growth, attitudes, and interest towards the industry.

My interactions with seniors have had a positive influence on my professional goals.

I felt like a member of the work community.

Few of the seniors I have had contact with are generally interested in students.

Few of the seniors I have had contact with are generally outstanding instructors.

Most of the seniors I have had contact with are genuinely interested in guiding me.

(All items are adapted from Pascarella and Terenzini, 1980.)

23. Answer the following items concerning the workplace instructor in your latest on-the-job learning firm.

The workplace instructor took time to provide me with an orientation.

The workplace instructor was committed to improving the quality of my work.

Overall, my workplace instructor did a really good job.

The workplace instructor was responsive to my requests for help.

The workplace instructor recognized and appreciated my good work.

(All items are adapted from Amenumey and Lockwood, 2008.)

24. Think about the development of your professional skills during the latest on-the-job learning period. Take a stance on the following items.

At the beginning of the on-the-job learning period the goals for my professional development were explicitly defined (based on Rampersad, 2004).

The support and guidance I received helped develop my professional skills (based on Rampersad, 2004).

I received feedback on my professional skills development regularly (based on Rampersad, 2004).

Evaluation discussions during the on-the-job learning period helped me improve my professional skills (based on Rampersad, 2004).

I received useful tips to improve my professional skills (based on Rampersad, 2004).

I learned to understand how my work is linked to the whole (based on Kock & Ellström, 2011).

I learned to understand the different tasks and processes from the viewpoints of other workers (based on Sundberg, 2001).

I learned abilities to manage new tasks (based on Kock and Ellström, 2011).

25. Take a stance on the following items related to knowledge transfer on the basis of your latest on-the-job learning period.

I did my tasks in the way that I learned from seniors (adapted from Szulanski et al., 2004).

I modified the way of doing tasks that I learned from seniors in order to make the practice workable (adapted from Szulanski et al., 2004).

I sometimes made unnecessary modifications regarding the ways of doing tasks that I learned from seniors (adapted from Szulanski et al., 2004).

The modifications I made did not succeed (adapted from Szulanski et al., 2004).

I learned a lot by observing seniors doing their jobs (adapted from Wilkesmann and Wilkesmann, 2011).

Seniors supported my efforts to gain work experiences (adapted from Wilkesmann and Wilkesmann, 2011).

I learned a lot by asking seniors (adapted from Wilkesmann and Wilkesmann, 2011).

Seniors had time to guide me in learning new things (based on Wilkesmann and Wilkesmann, 2011).

Seniors were always trustworthy (adapted from Mäkelä and Brewster, 2009).

When guiding me, seniors took into account my individual level of knowledge (adapted from Mäkelä and Brewster, 2009, and Tsai and Ghoshal, 1998).

I knew how seniors were going to act (adapted from Mäkelä and Brewster, 2009).

I had a deep understanding of seniors' everyday work practices (adapted from Mäkelä and Brewster, 2009).

I had a deep understanding of the professional language seniors use in their everyday work (adapted from Mäkelä and Brewster, 2009).

I received task-related information from the seniors (such as documents, books, or data) (adapted from Mäkelä and Brewster, 2009).

I received practical know-how from seniors on how to deal with tasks and situations (adapted from Mäkelä and Brewster, 2009).

26. The information and advice I received from seniors

…promoted the development of my professional skills (adapted from Levin and Cross, 2004).

…promoted fluent working (adapted from Levin and Cross, 2004).

…helped me to understand the impact of a single task on the whole (adapted from Levin and Cross, 2004).

…improved the quality of my work (adapted from Levin and Cross, 2004).

…improved my ability to cooperate with other workers (adapted from Levin and Cross, 2004).

27. What kind of relationships did you have with the seniors?

    My relationships with the seniors were (KTTIE 1. adapted from Levin and Cross, 2004).

28. Describe communication with the seniors.

    How often you were in touch with the seniors? (KTTIE 2, adapted from Levin and Cross, 2004).

29. Give your opinion about the adequacy of communication with the seniors.

I think that communication with the seniors was adequate (adapted from Levin and Cross, 2004).

30. Give your views about seniors.

It was clear to me that seniors would always look out for my interests (adapted from Levin and Cross, 2004).

It was clear to me that seniors would go out of their way to make sure that I was not harmed (adapted from Levin and Cross, 2004).

I felt that seniors cared what happened to me (adapted from Levin and Cross, 2004).

I had no reason to doubt seniors' competence (adapted from Levin and Cross, 2004).

31. Think about in which form you received information and advice (KTTACIT 1, adapted from Levin and Cross, 2004).

Was the information and advice you received in writing (for example, instructions, manuals, e-mails)?

32. Think about the information and advice you received.

Of what type was the information and advice you received? (KTTACIT 2, adapted from Levin and Cross, 2004).

33. When I needed information or advice from seniors

…it was generally hard for me to get in touch with them (adapted from Levin and Cross, 2004).

…I could find them (adapted from Levin and Cross, 2004).

…someone was usually around (adapted from Levin and Cross, 2004).

Part 6: Individual's impact on professional skills learning

34. Think about your opinion about professional skills learning and working. Take a stance on the following items.

Doing demanding tasks is satisfying (adapted from Sujan et al., 1994).

A real professional is continually improving his/her skills and know-how (adapted from Sujan et al., 1994).

Making mistakes is just part of the learning process (adapted from Sujan et al., 1994).

I learn from each task (adapted from Sujan et al., 1994).

There are not a lot of new things to learn regarding my professional skills (adapted from Sujan et al., 1994).

I am always learning something new about my work (adapted from Sujan et al., 1994).

It is worth spending time learning new approaches to tasks (adapted from Sujan et al., 1994).

It is important for me to continuously develop my professional skills (adapted from Sujan et al., 1994).

I sometimes expend a great deal of effort in order to learn something new (adapted from Sujan et al., 1994).

It is important to me that my workplace instructor sees me as a good worker (adapted from Sujan et al., 1994).

It is important to me that my co-workers consider me a professional (adapted from Sujan et al., 1994).

I feel very good when I know I have outperformed other workers (adapted from Sujan et al., 1994).

I always try to communicate my accomplishments to my workplace instructor (adapted from Sujan et al., 1994).

I spend a lot of time thinking about how my performance compares with that of other workers (adapted from Sujan et al., 1994).

I evaluate myself using my workplace instructor's criteria (adapted from Sujan et al., 1994).

35. Think about your beliefs regarding your abilities to manage situations related to work generally. Take a stance on the following items.

I am good at my work (adapted from Hellriegel and Slocum, 2007).

I know the right thing to do in different working situations (adapted from Hellriegel and Slocum, 2007).

I find it difficult to justify my work-related points of view if they are different from those of others (adapted from Hellriegel and Slocum, 2007).

My temperament is not well-suited for the profession I am learning (adapted from Hellriegel and Slocum, 2007).

I will be able to achieve most of the goals that I have set for myself (adapted from Chen et al., 2001).

When facing difficult tasks, I am certain that I will accomplish them (adapted from Chen et al., 2001).

I believe I can succeed in almost any endeavor that I put my mind to (adapted from Chen et al., 2001).

I am confident that I can perform effectively on many different tasks (adapted from Chen et al., 2001).

Compared to other people, I can do most tasks very well (adapted from Chen et al., 2001).

It is difficult for me to get down to work when I should (adapted from Schyns and von Collani, 2002).

When unexpected problems occur in my work, I don't handle them very well (adapted from Schyns and von Collani, 2002).

I avoid trying to learn new things in my work when they look too difficult to me (adapted from Schyns and von Collani, 2002).

When something doesn't work in my job immediately, I just try harder (adapted from Schyns and von Collani, 2002).

I feel insecure about my professional abilities (adapted from Schyns and von Collani, 2002).

As far as my job is concerned, I am a rather self-reliant person (adapted from Schyns and von Collani, 2002).

When something doesn't work well in my job, I give up easily (adapted from Schyns and von Collani, 2002).

I can remain calm when facing difficulties in my job because I can rely on my abilities (adapted from Schwarzer et al., 1997).

I feel prepared to meet most of the demands of my job (adapted from Schyns and von Collani, 2002).

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36. Think about your latest on-the-job learning period on the basis of the following items.

How satisfied / dissatisfied were you with

…the physical conditions of the on-the-job learning firm (adapted from Warr et al., 1979)?

…the freedom to choose your own method of working (adapted from Warr et al., 1979)?

…your fellow workers (adapted from Warr et al., 1979)?

…the recognition you get for good work (adapted from Warr et al., 1979)?

…your workplace instructor (adapted from Warr et al., 1979)?

…the amount of responsibility you were given (adapted from Warr et al., 1979)?

…your opportunity to use your abilities (adapted from Warr et al., 1979)?

…the tasks you were given (adapted from Tsui et al., 1992)?

…communication with fellow workers (adapted from Tsui et al., 1992)?

…the diversity of tasks (adapted from Tsui et al., 1992)?

…your on-the-job learning firm in general (adapted from Judge et al., 1995 and Scarpello and Campbell, 1983)?

37. Think about your tasks in your latest on-the-job learning firm. Take a stance on the following items.

There was variety in my tasks (adapted from Sims et al., 1976).

I was able to work independently of my workplace instructor (adapted from Sims et al., 1976).

I had an opportunity to talk informally with other workers while at work (adapted from Sims et al., 1976).

My workplace instructor gave me feedback on how well I was doing (adapted from Sims et al., 1976).

I had an opportunity to do a number of different tasks (adapted from Sims et al., 1976).

I was allowed to handle a task from beginning to end by myself (adapted from Sims et al., 1976).

I had an opportunity to get to know other people at work (adapted from Sims et al., 1976).

I had an opportunity to work independently (adapted from Sims et al., 1976).

I had control over the pace of my work (adapted from Sims et al., 1976).

The tasks given to me were simple and repetitive (adapted from Kim et al., 2009).

The job required me to use a number of high-level professional skills (adapted from Kim et al., 2009).

I had freedom to choose my own method of working (adapted from Warr et al., 1979).

I was given responsibility (adapted from Warr et al., 1979).

I had an opportunity to use my abilities (adapted from Warr et al., 1979).

My suggestions were taken into account (adapted from Warr et al., 1979).

38. Take a stance on your tasks during on-the-job learning period on the basis of the following items.

My job was complex and demanding (adapted from Shaw and Gupta, 2004).

My tasks required a lot of professional skills (adapted from Shaw and Gupta, 2004).

My tasks required a lot of training before I was able to perform them well (adapted from Shaw and Gupta, 2004).

Thank you!

Appendix II

Professional skills learning during on-the-job learning

Learning of professional skills is an important issue for the student, firm, and school. This questionnaire is a part of a study examining factors that are the most significant ones for professional skills learning. This questionnaire concerns the student's professional skills development from the workplace instructor's point of view. Your opinions and viewpoints are valuable in examining the learning of professional skills. Responses are handled confidentially. Answering will take about 15 minutes.

1. Students of xx vocational college who have been under your guidance during autumn 2011 and spring 2012 (first name, last name):

   Student 1 / Student 2 / Student 3 / Student 4

2. Think about the third-year students' on-the.job learning period under your guidance. Evaluate their professional skills and its development with the help of the following items.

The student:

1. The student mastered professional theory.
   (Studying vocational qualifications includes professional theory, for example, accounting or hair dyeing needed in practical work)

2. The student showed initiative.
   Nikolova et al. (2014)

3. After orientation the student performed the tasks given to him/her in a professional manner.
   Ellström (1997), Kock & Ellström (2011), Pascarella & Terenzini (1980)

4. The student had the ability to perform versatile tasks.
   Ellström (1997), Kock & Ellström (2011), Pascarella & Terenzini (1980)

5. The student adapted him/herself well to the work community.
   Ellström (1997), Kock & Ellström (2011)

6. The student's practical work was fluent.
   Ellström (1997), Kock & Ellström (2011)

7. The student received regular feedback on his/her professional skills.
   Hurley (2002)

8. The student was able to utilize the feedback he/she received in performing tasks.
   Hurley (2002)

9. The student's interest towards the branch and the profession increased during the on-the-job learning period.

   Pascarella & Terenzini (1980)

10. I am satisfied with the extent the student's professional skills developed.

    Pascarella & Terenzini (1980)

1 = totally disagree
2 = disagree
3 = somewhat disagree
4 = somewhat agree
5 = agree
6 = totally agree
7 = n/a

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