

Becoming a construction worker

A study of vocational learning in school and work life

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Till min älskade fru och våra två underbara barn

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Abstract

This thesis describes and analyses vocational learning in school and workplaces, particularly the vocational learning involved in becoming a construction worker in Sweden. This includes learning the trade in upper secondary school education and a subsequent apprenticeship. An underlying argument is that activities in these contexts enable a diverse vocational learning outcome. However, there are potential tensions and contradictions, especially between production- and education-oriented aspects of the learning activities in these settings. To address these and associated issues, two research questions were posed. First, how do work-based activities enable vocational learning? Second, what forms of learning are enabled in school and work life settings and how are these forms of learning constituted? These questions were addressed using information drawn from observations, interviews and a survey. Analyses of the data, using a theoretical framework based on activity and forms of learning theory, show that the school and workplace settings enable different types of learning that form a joint constructed object. Further, the contexts provide diverse tasks that, with guidance from more experienced persons, can enhance the learning outcomes. So, vocational learning is enabled through tensions in the activity systems that form a learning outcome. In project-based vocational education and training (PBVET) provided in upper secondary school, vocational learning is enabled through basic training and opportunities to learn key techniques. In subsequent apprenticeships, the transformation of basic knowledge into specialized knowledge is enabled through close guidance and by the apprentices performing complex tasks. There are also clear differences in the freedom allowed in the performance of tasks between the PBVET and apprenticeships. The PBVET does not allow students to develop and apply their own solutions, while apprentices are encouraged to discover and implement solutions that enhance the performance of tasks. So, different forms of learning are enabled in the two contexts; the PBVET largely promotes reproductive learning and the apprenticeships largely promote productive learning. Scope for improvement was detected, as the PBVET does not appear to provide knowledge that fully meets criteria in the syllabuses, and the apprenticeship does not fully meet the learners' educational needs. However, the settings provide complementary vocational learning opportunities. Thus, tensions and contradictions can be identified in the activity systems in the school and workplace settings that collectively form the boundaries of a learning outcome that largely corresponds to what the learners need to know and (hence) *become construction workers*.

List of articles

This compilation thesis consists of a capstone and four appended articles, which are referred to in the text by the corresponding Roman numerals.

- I. Fjellström, M. (2014). Vocational education in practice: a study of work-based learning in a construction programme at a Swedish upper secondary school. *Empirical Research in Vocational Education & Training*, 2014 6:2.
- II. Fjellström, M. (2015). Project-based vocational education and training: opportunities for teacher guidance in a Swedish upper secondary school. *Journal of Vocational Education and Training*, 67(2), 187-202.
- III. Fjellström, M. (submitted). Vocational learning in a Swedish post-secondary apprenticeship. *Submitted to Empirical Research in Vocational Education & Training*. (under review).
- IV. Fjellström, M. and Kristmansson, P. (2016). Learning as an apprentice in Sweden: a comparative study on affordances for vocational learning in school and work life apprenticeship education. *Education + Training*, 58(6), 629 - 642. © Emerald Group Publishing Limited all rights reserved.

Comments on my contribution

I was responsible for formulating the research idea, collecting and analysing presented data, and writing Articles I-III. I also formulated the general idea for the research presented in Article IV, contributed to collection of the presented empirical material, and was responsible for the comparative analysis of vocational learning in the school and work life settings. Both authors contributed to recommendations for an apprenticeship curriculum and writing of the article.

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1. Introduction

If you glance around you, and you are in a building, it will probably be immediately apparent that construction workers have engaged in various tasks in your vicinity. Floors have been laid, windows installed, and rooms with doors or other openings created. Who has not been in a kitchen installed by a construction worker? Or maybe you crossed a bridge on the way to work? By just looking around us it is easy to see things made by construction workers, and start wondering about how they made them, the diversity of tasks involved, and the diverse skills required. Professional construction workers must learn their skills in some way or other, in other words, they must each become a construction worker. Moreover, we can see that generally the tasks have been performed reasonably well. So, what does a construction worker need to know to perform different tasks? In a previous occupation as a construction worker, I performed such tasks in a quite unreflexive way. It was not until the later part of my teacher training programme that I became interested in how someone learns their vocation and, further, as a vocational teacher how my skills can be taught to the students. Drawing on this interest my graduate studies started with a focus on what tasks construction students perform in relation to assessment. Thus, the initial idea was to observe and find out more about assessment of vocational skills according to stated goals in course syllabuses. The initial research idea needed some adjustment, as in many doctoral projects, mainly because observations I made indicated that the students would have difficulty reaching some of the goals. This insight shifted my research interest towards vocational learning, i.e. ‘what they learn’ and ‘how they learn’.

However, learning in vocational education and training (VET) is complex and diverse facets have been considered in various studies, including the following six highlighted in a review by Tynjälä (2013, p. 11):

(1) studies describing the nature of workplace learning, (2) research on work identities and agency in workplace learning, (3) studies on the development of professional expertise, (4) analyses of competence development in education–work contexts in vocational education and training as well as in higher education, (5) research on communities of practice, and (6) research on organisational learning.

All these facets of learning have numerous aspects, and are influenced by numerous highly interactive factors, all of which undoubtedly influence phenomena considered in this thesis. However, the thesis mainly focuses on the fourth facet, as learning in education and work are key components of VET (Schaap, Baartman, and de Bruijn, 2012). Learning in VET based in school and work life has different rationalities (Helms Jørgensen, 2004; Schaap et

al., 2012), so different types of learning can be developed in them (Aarkrog, 2005). Furthermore, according to another review, by Schaap et al. (2012, p. 99), there are six main aspects of vocational learning in education and work:

(1) students' expertise development, (2) students' learning styles, (3) students' integration of knowledge acquired in school and workplace, (4) processes of knowledge development, (5) students' motivations for learning and (6) students' professional identity development.

All these aspects influence learning in education and work, but this this thesis primarily considers the third aspect: learning in school and workplaces. More specifically, it considers VET in Sweden, where there are 12 upper secondary VET programmes (Skolverket, 2011). Some programmes provide direct access to the corresponding profession (e.g. for those who are to become healthcare workers or business and administration workers). However, some occupations (including construction work) also require training in a workplace in the form of an apprenticeship (hereafter simply apprenticeship), after graduation from upper secondary school. The studies this thesis is based upon addressed education and work in both school and workplaces, by following a group of students during their passage through the construction programme and subsequent apprenticeship.

2. The research field

To find studies related to vocational learning (particularly in Swedish settings), databases including Google Scholar, LIBRIS and Web of science were initially searched using Swedish keywords, such as 'yrkesutbildning', 'lärande' and 'bygg'. To extend the search beyond Swedish publications, English phrases such as 'vocational education', 'upper secondary school', 'apprenticeship' and 'vocational learning' were subsequently used. This strategy helped bring some clarity to my research and hone my research interests. These searches identified a substantial amount of literature, which had to be sorted. Searches in VET-oriented journals, such as *Vocations and Learning*, *Journal of Vocational Education and Training* and *Journal of Education and Work* also provided helpful literature.

This section starts by overviewing the identified research related to VET in general, and then studies more specifically related to core concerns of this thesis. The intensity of research on VET and associated issues in Sweden has sharply increased in recent years, largely due to efforts of two recently established national research schools in vocational pedagogy. A PhD thesis, by Muhrman (2016), highlighted this increase by considering research on various aspects of VET published since an overview by Lindberg (2003c). For example, 12 licentiate theses emanated from one of these research schools between 2014 and June 2016, and 30¹ articles between 2012 and 2015. These publications focus on various vocational pedagogy issues in upper secondary school. In addition, 23 chapters of books, two reports and 59 conference papers on such issues were published by Swedish researchers during this period. So, the research field is generally growing in Sweden, but research regarding vocational learning specifically in the construction area is sparse.

In another strategy, relevant literature was identified by a snowballing method (Greenhalgh and Peacock, 2005; Van Ham, Verhoeven, Groenier, Groothoff, and De Haan, 2006). This approach (cf. Tynjälä, 2013) enabled identification of both national and international literature concerned with VET in school and work life in general, but also literature regarding VET in the construction sector, which is not always indexed as such (cf. Berglund and Henning Loeb, 2013; Worthen and Berchman, 2010). The identified publications address diverse issues and could be classified in various ways. However, in accordance with the main themes of this thesis (VET in school and work life) their contributions to *Research on school-based VET* and *Research on VET in work life* are briefly reviewed below.

¹ Including articles I and II in this thesis.

Research on school-based VET

According to Berglund (2009), research on vocational learning in the construction area is highly limited. Nevertheless, a few studies have considered the Swedish construction VET programme. Notably, an analysis of teachers' perceptions by Hårdig (1995)² concludes that the teachers involved in this programme are well prepared to provide their knowledge to the students. Berglund (2009) also considers this VET programme, but focuses (using a lens based on activity theory) on how construction students' skills are shaped by participation in project-based vocational education (PBVET)³ and interaction with work life during the mandatory 15-week practice period.⁴ Berglund states that the dichotomy between theory and practice has guided her research, but in this thesis the main focus is on 'practice'. As noted by Lindberg (2003a), students in the construction programme participate in three types of tasks: "mostly literate" school tasks (p. 162), based on reading and answering questions; simulation tasks, which were rare in the construction programme; and finally vocational tasks, where the students perform tasks that are used in production of objects for paying customers, consequently "learning is no longer the only focus of the task" (p. 167). Apparent similarities to the third type can be seen in some tasks in both the PBVET and apprenticeship (where production is the main priority, as discussed in detail later). In addition, Högberg (2009) has found that vocational students in the construction programme often have little interest in core subjects, and considers the power relations involved and the students' constructed identities in a gender and class perspective. Westman (2009) takes a different theoretical approach towards construction students by focusing on and analysing their writing abilities in a social linguistic perspective.

Although research specifically related to the construction programme is limited, some studies have examined various aspects of project-based learning (Tanner, 2015), which shares features with PBVET. As PBVET is closely related to learning in work life it can be perceived as a hybrid of school-based VET and VET in work life, where participation and performance of work-based tasks are core elements of the education. A specific feature of 'Project-based learning' (PBL) in PBVET is that: "The typical PBL project over a period of time allowing students to acquire new skills and knowledge needed to

² There have been two reforms in the teacher training programme since Hårdig's study.

³ Berglund refers to 'student object', which is similar to what I call PBVET in this thesis. A specific feature of the PBVET that I refer to is that an object provides the students with the educational content and the work is organised as a 'live project' in a 'real' work site. See Articles I and II for a more detailed description of the PBVET.

⁴ This practice is performed at workplaces in relation to the curriculum and should not be mistaken for the apprenticeship addressed in this thesis.

successfully complete the project” (Tanner, 2015, p. 29). In such a PBVET, producing objects for a customer can be seen as both providing formal learning for the students and enhancing their vocational skills.

Research on VET in work life

Various studies have addressed work-based learning (cf. Billett, 2001; Ellström, 2001; Fuller, Hodkinson, Hodkinson, and Unwin, 2005) and elucidated various aspects of learning in work life, but literature regarding apprenticeships that are organised outside educational institutions, i.e. school, is sparse (Billett, 2016). The only text I discovered in the searches described above was a text published in 1982 that mentions apprenticeships for construction workers with no further reflection (Kronlund, 1982). Therefore, to complement the search strategy I contacted the Swedish Construction Industry and Training Board (SCITB;⁵ *Byggnadsindustrins yrkesnämnd* or BYN in Swedish), which identified two reports (Hoffrén-Larsson, 2002; Hoffrén-Larsson, 2004) that address apprenticeships for construction workers. Hoffrén-Larsson (2002) presents four recommendations to raise the quality of apprenticeships. First, the aims of the apprenticeship and clear goals need to be highlighted. Second, more knowledge of educational aspects is required in the industry. Third, actors in the school and work life settings need to collaborate to provide an unbroken pathway to becoming a construction worker. Finally, the construction industry should consider changes in the labour market and the strong belief pervading the industry that the traditional mode of post-secondary apprenticeship (cf. Berglund and Lindberg, 2012) ensures a good education.

Following on from the first report, the second report (Hoffrén-Larsson, 2004), evaluates the structure of apprenticeships, presents recommendations to improve it, and outlines an educational model to develop a more modern and pedagogically-oriented format that supports the apprentices’ development of vocational skills. The model has three main tenets: apprenticeships should be regarded as education and clearly educationally-oriented, their content should be planned and regularly followed-up, and development of the apprentices’ vocational skill should be prioritised rather than host companies’ production needs. Hoffrén-Larsson (2004) identified eight key issues that must be addressed to improve apprentices’ vocational skills. Clarification of who is responsible for the content is needed. Everyone involved should be aware that an apprenticeship is a form of education. Both supervisors and apprentices must be aware of the skills that require development. The

⁵ The SCITB is the organisation in charge of the apprentices’ education and includes representatives of both the trade union for construction workers (Svenska Byggnadsarbetareförbundet) and the construction industry. It also hands out the booklets where apprentices document worked hours.

apprentice's motivation and responsibility are important. The companies need to improve activities that foster a good learning environment. Apprentices' job satisfaction must be increased. Company staff must regard apprentices as future colleagues. Use of the model can enhance the development of vocational skills.

The sparsity of research regarding construction workers is also highlighted by Worthen and Berchman (2010), who studied apprenticeships in unionised building trades in the construction sector. Specifically, they addressed how on-the-job learning occurs. Worthen and Berchman's study object has similarities to the apprenticeship addressed here, where vocational learning in the trade is developed through the logic of work life. They conclude that apprentices can learn the trade in three ways: by performing tasks, taking the initiative (which promotes learning by encouraging co-workers to allow them to tackle more complex tasks), and through being part of a community of practice (cf. Lave and Wenger, 1991). Further, they point out that the economic logic of producing and performing tasks is the most important factor affecting the tasks that the apprentices engage in. So, "[a]ny teaching and learning must be secondary to the time pressure of the schedule of the work. The economic relationships are stark" (Worthen and Berchman, 2010, p. 231).

Nevertheless, according to Lindberg (2003b), learning of vocational skills at workplaces as an apprentice largely involves "learning task specific skills while participating in the production..." (p. 17), although the learners also have opportunities to become part of the community of practice, thereby advancing their skills (Lave and Wenger, 1991; Rogoff, 2008). Thus, "[l]earning is seen as the process of individuals changing their engagement in and contribution to a community of practice" (Köpsén, 2011, p. 22). So, learning in work life can be seen as an interaction with more skilled co-workers (Baumgarten, 2006), where "development and transference of occupational skills, knowledge and understanding" take place (Fuller and Unwin, 1998, p. 154). Studies covering learning vocational skills through apprenticeship (cf. Fuller and Unwin, 1998, 2003, 2011) and policy implications of apprenticeships (Dumbrell and Smith, 2013) are relevant to this thesis as they address the relationship between learning vocational skills and performing work-based tasks. In another approach, Zitter et al. (2016) consider potential contributions of informal vocational learning in work-based activities to VET, and the optimal design for a VET curriculum that combines school and workplace learning.

However, while an apprenticeship of the kind considered here may provide informal learning, the apprentices are supposed to reach learning goals during their apprenticeship (Byggnads, 2010). The idea that apprentices meet goals

by learning specific work-related tasks during their apprenticeship is also highlighted by Bilginsoy (2003, p. 55): “The essence of the apprenticeship system is that the worker is indentured to an employer for a predetermined period of time during which he or she learns a wide range of skills required in a trade ...”. As in the Swedish pathway for construction workers, this implicitly assumes that ‘serving time’ and learning by performing tasks are closely correlated. Using time served as a measure of a learning outcome in the construction industry is problematic because, according to Hoffrén-Larsson and Gustafsson (2003), assessments should focus on what is supposed to be learned during an apprenticeship. Nevertheless, task-specific skills related to workplace demands must be core elements of workplace learning (Billett, 2001; Schaap et al., 2012). Thus, learning the occupation depends on the learner’s ability to interact with and through artefacts provided in the environment (Chan, 2015). On the other hand, performing tasks in work life will require some basic skills, notably spatial skills for carpenters⁶ (Cuendet, Dehler-Zufferey, Arn, Bumbacher, and Dillenbourg, 2014), such as the ability to work out how to perform tasks required to create structures illustrated in drawings.

School and work life

Studies (such as those this thesis is based upon) encompassing both VET in school and VET in work life can be described as hybrid research (Schaap et al., 2012), as there are clear differences in the two settings, even if the school strives to incorporate work life-like features and vice versa. Thus, earlier research tends to argue that understanding learning in school and workplaces is challenging since the two educational settings represent different practices (cf. Akkerman and Bakker, 2012; Zitter et al., 2016) where different types of knowledge can be developed (Schaap et al., 2012; Tanggaard, 2007). Accordingly, “[d]esigns for school-based and workplace learning arrangements have different rationales and purposes” (Zitter et al., 2016, p. 2). However, as both education and work in school and work life are needed to become a construction worker it is argued that the two arenas should be regarded as complementary.

Based on the idea that school and work life enable different types of vocational learning, an aim of this thesis is to enhance understanding of vocational learning within the two contexts. There are both similarities and differences between learning in school and learning as an apprentice in work life, in that both provide (to varying degrees) opportunities to perform authentic tasks in an authentic environment. Moreover, learning at school and in a school

⁶ In this thesis the term woodworker is used according to Skolverket (2011).

context provides (or should provide) essential foundations for work life learning, which has distinct features, according to Aarkrog (2005, p. 146):

Although much can be learnt in the workplace, it is necessary to supplement experiences here with school-based learning. It is fruitful to regard the workplace as a specific community of practice which offers specific opportunities for learning. These opportunities differ from those in schools. Any attempts to make school copy learning in the workplace or the workplace adopt the characteristics of school-based learning will diminish the advantages of learning in school and in the workplace, respectively.

Drawing on this interpretation, a range of aspects related to major themes of this thesis can be recognized. First, identifying structures and analysing how school and work life can affect both students' learning and associated expectations is important. Further important aspects are the influences of vocational teachers' ability to educate on both the educational content and the students' possibilities to learn. Understanding how practical aspects of syllabuses and practical performance interactively affect the fulfilment of learning goals is also important, because "[l]earning goals effectively define what it means to "understand" in the context ... what students are expected to learn" (Chasteen, Perkins, Beale, Pollock, and Wieman, 2011, p. 71 f). However, fulfilling educational goals by performing workplace tasks is challenging according to Kristmansson (2016), who concludes that individual and workplace goals are superior to educational goals when education is located in work life. If so, learning by working is more complex than reaching standard educational learning goals. Similarly, following analysis of school-based education for construction students, Berglund (2009) raised concerns about how well prepared construction students really are to meet demands of future work life. Thus, despite considerable research on learning in both school and work life, "[i]t is still unclear how students need to combine and integrate those different knowledge, skills and attitudes into a coherent set of professional competences, since few empirical evidence is available concerning the content of what needs to be learning and how such content needs to be offered and enhanced" [sic.] (Schaap et al., 2012, p. 114).

This and the previous chapter have provided indications and argued that vocational learning for construction workers is bounded with an inner logic of two quite different educational arenas. Thus, activities within these work-based contexts (school and work life), and their synergism, may determine the quality of vocational learning.

Aim and research questions

The aim of this thesis is to describe and analyse vocational learning in school and work life. To address this aim the following research questions (RQ) were posed:

RQ1. How do work-based activities enable vocational learning?

Assuming that school and work life are distinct educational arenas, in both of which learning is heavily based on performing tasks, this question was intended to focus attention on potential tensions and contradictions in activity systems, and (thus) highlight how they enable vocational learning.

RQ2. What forms of learning are enabled in school and work life settings and how are these forms of learning constituted?

Assuming that activity systems in school and work life differ, and thus enable distinct learning outcomes, this question was intended to focus attention on how activities in the two educational contexts may enhance or constrain diverse forms of vocational learning.

Outline of the thesis

As already mentioned, this is a compilation thesis, consisting of 7 chapters and four appended articles describing the studies in more detail. Chapter 1 describes my interest in and presents background information about the subject matter by introducing the diverse aspects of learning to be, and becoming, a construction worker. Chapter 2 reviews the relevant research field related to the thesis then presents the aim and research questions. Chapter 3 provides an extensive overview of the research contexts and their local history. Chapter 4 presents the theoretical frameworks applied in relation to the aim and research questions. Chapter 5 presents the design of the (two) studies that provided the empirical material. Chapter 6 summarises the four appended articles and, finally, Chapter 7 presents an analysis and discussion of the results in relation to the aim and research questions, reflections on the contribution of the work, and ideas for further research.

3. Background

Activities are shaped historically and need to be studied in a local perspective (Engeström, 2001). Thus, this chapter first briefly outlines the structure of the VET addressed in this thesis, then provides a more thorough description of the local history⁷ and introduces the *research contexts*.

VET for construction workers

When implementing the 1994 curriculum for the non-compulsory school system⁸ (Lpf 94), SCITB noticed a shift from work life to school-based VET (SCITB, 2013). One argument for this change was that the construction industry did not have time to provide a broad vocational education. Another was that complex municipalities require broader skills than the construction industry could offer (SCITB, 2013). In accompanying changes, VET in upper secondary school became three years long instead of two years, several core subjects were introduced, workplace training of at least 15 weeks became mandatory and all programmes gave access to higher education. Thus, the mission for upper secondary school evolved into provision of a community service (Hedman, 2001), training vocational students through practical exercises and theoretical explanations (Berglund, 2009). To complete the educational pathway to becoming a construction worker, upper secondary education has been followed by an apprenticeship (Berglund, 2009) regulated by the SCITB.

Upper secondary school

Swedish upper secondary school education is normally three years long (six semesters) and the students take courses, on both vocational and core⁹ subjects, that provide 2500 credits in total on completion (Upper Secondary School Ordinance, 2010:2039). However, the school system constantly changes (Lundahl, Erixon Arreman, Lundström, and Rönnerberg, 2010) due to both school reforms and changes in the construction industries' requirements for skilled workers.

⁷ A historical overview of vocational skills and production in the construction industry is presented in Berglund (2009). The historical aspects in this thesis focus on the specific contexts and their local history since PBVET was initiated in the early 2000s.

⁸ When the work of underlying this thesis started the previous curriculum for non-compulsory school (Lpf 94) was about to end and the present reform, GY 2011, was about to be initiated. The students that are referred to in this thesis followed Lpf 94.

⁹ Since the 2011 reform core subjects have been called foundation subjects (Skolverket, 2011). In this thesis the term core subject will be used.

The Education Act (2010:800) provides general rules and rights regarding students' education. It is complemented by the Upper Secondary School Ordinance (2010:2039) which, in addition to the Education Act, sets rules for upper secondary school. The curriculum for upper secondary school handles functions and value. The curriculum for upper secondary school (Lpf 94, until it was superseded by the GY 2011 reform in 2011) outlines schools' educational and social functions and duties in terms of norms and values, students' responsibilities and influence, educational choices, grades and assessment and the principal's responsibilities (Lpf, 1994). While the curriculum states the mission for the school, the course syllabuses state the learning goals that a student is supposed to reach according to local conditions at each school.

On leaving upper secondary school, construction students who have passed all their core and vocational courses are credited with 2500¹⁰ points, which are converted into hour-equivalents by the SCITB representatives in consultation with the students' vocational teacher. The SCITB also enters another 300 hours into the educational logbook that records the students' progress through their apprenticeship. In addition, while VET students they can work during holidays at construction sites, and the hours spent will be recorded in their educational book, thereby reducing the remaining time as apprentices.

Work life

Performing and completing upper secondary school is a way of getting a ticket into apprenticeship in the construction industry. This pathway is the most common way of vocational training that prepares the students for work life (SCITB, 2013). Being educated in apprenticeship is regulated in an agreement between the trade union for construction workers (Svenska Byggnadsarbetareförbundet) and The Swedish Construction Federation (Sveriges Byggindustrier) that is controlled by the SCITB. This regulation states that each apprentice will be assigned a supervisor, who will support the apprentice during his/her apprenticeship through regular meetings, formulating learning goals, and recording the apprentice's progress in documents that both the supervisor and apprentice can see. The apprenticeship should correspond to the individuals' chosen orientation, and provide essential knowledge regarding the host construction company's needs (Byggnads, 2010). So, the company that recruits an apprentice is responsible for assigning supervisors and meeting his/her educational needs.

¹⁰ 2500 hours is the maximum time that can be credited to a student through passing both core and vocational courses in his/her VET programme. If a student fails one or more courses these credits/hours will be reduced by the same amount of credits the failed course comprises, thereby increasing the time as an apprentice.

In terms of time served, each apprentice begins his/her apprenticeship with the hours documented in his/her educational logbook, including the credited hours from working in holidays (Byggnads, 2010). Hence, the maximum number of credited hours is 3300, and the remaining time requirement (up to 6800 hours) must be met by working at a construction site as an apprentice. Thus, the time students spend as apprentices can vary, depending on whether they passed all courses and if they worked during holidays in school. After working and documenting the remaining hours in their educational logbook they can apply for a professional certificate corresponding to their orientation.

In addition to specific categories set out in their educational logbook, the apprentices are supposed to meet 64 general learning goals¹¹ (see Appendix 1), describing the kinds of competences that a certified construction worker should have developed (Byggnads, 2010). These goals concern the following key aspects of construction work: construction documents, tools and machines, building materials and external environment, building processes, building techniques and calculations, health and safety, reinforcement, facades, interior work, interior surfaces, insulation, frame completion, frames and roofs. They can also be categorised as know-how or know-what goals. However, the apprentices' pay starts at 55% of the rate for a fully qualified worker with a professional certificate, then rises to 60, 65, 75 and 88% of this rate after working 2300, 2800, 4301 and 5501 hours, respectively, as documented in their educational logbook (Byggnads, 2010). Hence, salary milestones on the route to becoming a fully qualified and fully paid worker with a professional certificate are based on hours spent working in the construction industry rather than meeting educational goals *per se*.

Research contexts

Key aspects of the contexts of the empirical material collected to elucidate how school and work life can contribute to vocational learning are described in the following sections: the local history of the focal settings, and associated pathway of becoming a construction worker.

Local history

In the early 2000s, numbers of applications for the local construction programme considered here increased, the annual intake increased from 48 students in 2000 to 64 and (hence) the school premises became too small. To handle the increased intake, the school formally requested the local

¹¹ The goals have been published at the SCITB's official website since 2009, and since 2011 they have been connected to the apprentices' educational logbooks.

government to provide plots to build houses on¹². Allowing the students to participate in their construction would address criticism by the construction industry that the local programme lacked sufficient educational quality (the school's PBVET had been previously based on diverse projects, with little similarity, so the students developed highly variable skills). Prompted by the increased number of students and pressure from the construction industry to improve the quality of the education, the school started to construct houses as part of the construction students' education. In this manner, the school managed to increase the number of students and meet demands from the construction industry. To supervise the construction site and act as a contact person with the local government, the school employed a site manager.

When these projects started in the early 2000s, there was no clear division of duties between the principal, vocational teachers and site manager. Thus, a delegation of authority¹³ was drawn up, declaring their respective responsibilities. Briefly, the teachers' responsibility was to educate the students in accordance with the site manager's ideas, while the site manager's responsibilities were to meet criteria stated by the Swedish Work Environment Authority and his own quality requirements.

The construction programme addressed in Article I and II is school-based¹⁴, and consists of preparation in the first year at the school premises, followed by "project-based vocational education and training" (PBVET) in years two and three.

Semester one and two – preparation for PBVET

In the first year, the students are taught their vocational subjects for two days a week while three days are assigned to core subjects (e.g. Swedish, English, Mathematics, History). The vocational elements during the first semester include four mandatory courses designed to provide students a "taste" of common vocational orientations in the construction industry. They include both practical and theoretical components, and are intended to help the students to choose an orientation, and thus the kind of construction worker (e.g. woodworker, concrete worker, bricklayer or painter) they want to become (cf. Berglund, 2009). After these "taster" courses the students must choose a vocational orientation. All orientations have a maximum intake, and if too many students choose a given orientation those with the highest grades in the

¹² The formal request is not attached due to confidentiality, but the core argument is summarised in the text.

¹³ The delegation of authority is not attached due to confidentiality, but the core argument is summarised in the text.

¹⁴ Another form of school-based VET is upper secondary apprentice education (USAE), where the vocational courses are performed in work life.

corresponding vocational course are accepted until the maximum number is reached, and those with lower grades are directed to their second choice of orientation. The most popular choice is to become a woodworker. At most 48 students per year can be accepted for this orientation, divided into three classes (one final-year class was the focal group in studies reported here). During semester two the students intending to become woodworkers mainly build objects such as small houses (friggebod in Swedish), sheds and playhouses. This semester can be seen as preparation for their PBVET, which follows during semesters three to six.

Semesters three to six – PBVET

During the following two years (semesters three to six), these students complete practical elements of their PBVET by participating in activities (associated with their orientation) involved in the production of buildings. Theoretical elements of their orientation, largely based on instructions for coming production tasks, are covered in huts.

Based on the educational structure, the students conduct their PBVET two days a week.¹⁵ During an average day there are up to 70 students pursuing various orientations, and a diverse set of vocational teachers, at the PBVET site. To coordinate all their activities the site manager guides the production activities according to the delegation of authority.

As it takes about 10 semesters to build a house, the students participate in tasks related to the current production phase. Thus, the students' vocational learning occurs through participation in production-dictated activities, as in work life contexts. The PBVET of the students who participated in the studies underlying this thesis occurred in the middle of this building process. Notably, during the students' mandatory workplace training period the production process continued with other students, so the production had progressed to a new phase when they returned.¹⁶ This hindered assignment of specific tasks to specific students, and assessment of their specific contributions. In addition to the vocational courses that are performed at the PBVET site, core subjects are performed at the school premises during the other weekdays. Through this arrangement, the provided education encompasses both theoretical core subjects and vocational subjects that collectively comprise VET in school.

¹⁵ Students in semesters three and four conduct their PBVET during another two days in the same weeks.

¹⁶ This period is not considered here because (as described later) the empirical studies focused on PBVET and the apprenticeship, which is arranged by the SCITB.

Apprenticeship

After completing upper secondary school, the students enter work life through apprenticeship to fulfil the 6800-hour requirement for a professional certificate. Getting employment as an apprentice is the individual's own responsibility and many of my informants had arranged for their employment before graduating from upper secondary school, while others arranged theirs later. The apprentices work at diverse worksites, and perform tasks related to whatever is being constructed at their respective worksites. As the apprentices are employed they follow the rules and regulations set out at each workplace regarding when they should work (time) and division of labour (they rarely work by themselves). The employment as an apprentice may be based at one or several companies, and some of the apprentices who participated in this study had had more than one employment. When sufficient hours have been spent on appropriate tasks, according to categories in their educational logbook, the apprentices become fully paid construction workers with a professional certificate.

4. Theoretical framework

The theoretical framework applied here is based on activity theory (Engeström, 1987; 2001) and Ellström's (2001) concepts of forms of learning. Activity theory is primarily used to analyse the results in relation to contradictions and tensions in the upper secondary school and apprenticeship activity system, and how their components shape a learning outcome (RQ1). Ellström's concepts are primarily used to analyse how school and work life enable different forms of learning in the focal settings, and how these are constituted (RQ2). General aspects, and subsequently more specifically relevant aspects, of these theories are described in the following sections.

Activity theory

The underlying concept of activity theory is based on concepts of stimulus (S) and response (R) presented by Vygotskij (1978). The theory regards the individual as a key element of his/her own learning, the relationship between a human subject and an object as never direct but mediated by social and cultural factors, and consciousness (learning) as emerging from activity mediated by "second order stimuli", consisting of artefacts and signs (Engeström, 2001). Thus, it is necessary to elucidate the mediators (X) linking S and R in order to understand learning (Figure 1).

This model can be regarded as the first generation of activity theory (Engeström, 2001). Vygotskij (1978) also argues that: "The central characteristic of elementary functions is that they are totally and directly determined by stimulation from the environment" (p. 39). Thus, learning occurs through the relationship between the stimulus, the response and the mediated act where learning takes place.

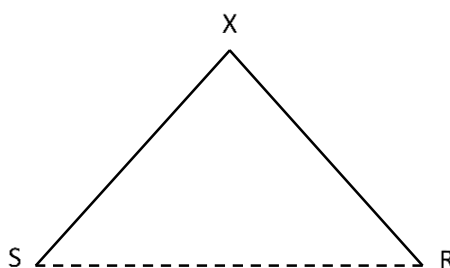


Figure 1. A model of a complex mediated act (Vygotskij, 1978, p. 40), where S, R and X are stimulus, response and mediating artefact, respectively.

While Vygotskij is considered to have initiated the basic idea of activity theory (Engeström, 2001), Leontiev (1978) further developed it. Although he never constructed a formal model, Leontiev (1986) concluded that actions depend on motives and every activity must have one, even if it is difficult to identify. Another central tenet of activity theory, proposed by Kuutti (1996), is that there are correspondences between goals and actions that develop over time through processes that “cannot be transformed into outcomes at once, but through a process consisting often of several steps or phases” (p. 30). As Kuutti (1996) also states: "Activities are realized as individual and cooperative actions, and chains and networks of such actions that are related to each other by the same overall object or motive" (p. 30). Accordingly, the starting point in an activity is, or should be, guided by a common motive. Thus, an activity consists of different actions, which are initiated by the motive.

Based on the components described by Leontiev (1986), Engeström (1987) developed a second generation of activity theory, encapsulated by the model shown in Figure 2. As shown in Figure 2, this is encapsulated in a complex model of development and learning through activity, based on the complex relationships underlying individual and collective activity. The key relationship, schematically illustrated in the upper sub-triangle, is similar to the one in the first generation, as mediating artefacts act as second-order stimuli. It also considers relationships between the subject and community, mediated by rules, as well as the object and community, mediated by division of labour. Thus, activities are bounded by components in the upper sub-triangle (Engeström, 1987), but development of the second generation of activity theory enabled consideration not only of individuals but also collective prerequisites for learning.

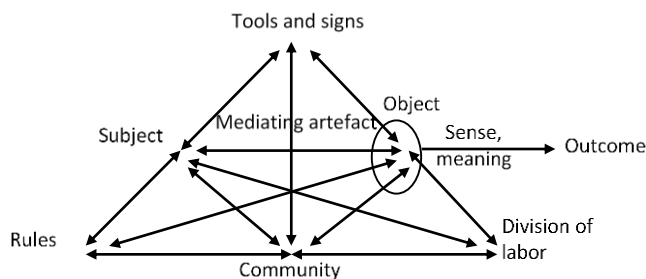


Figure 2. The structure of a human activity system according to Engeström (1987, p. 78).

Thus, the second generation of activity theory considers the relationships involved in an *activity system*. The third generation includes combinations of activity systems (Figure 3), thereby considering not only the relationships between different activities, but also how joint constructed boundary objects

“interact to form new meanings that go beyond the evident limits of both” (Engeström, 2001, p. 136).

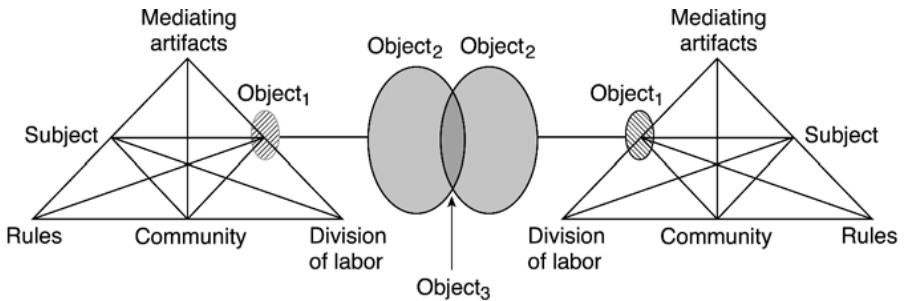


Figure 3. A model of third generation of activity theory (Engeström, 2001).

The basic model of third-generation activity theory includes at least two activities that are integrated through operations and unreflective motives (*object₁*) that generate a meaningful collective motive (*object₂*), which creates a boundary object (*object₃*) where the motives have been integrated or jointly constructed (Engeström, 2001).

In this thesis, education and production are regarded as two contrasting activity systems, which are present in both the focal school (PBVET) and work life (apprenticeship) settings. Thus, third-generation activity theory (Figure 3) is used to analyse how contradictions and tensions within these activity systems can enable vocational learning. In the following sections, identified components of the PBVET and apprenticeship systems are further explained in relation to the theory.

PBVET

Although components of activity systems can be analysed in various ways, the educational activities considered here are embedded in a PBVET governed by *rules*, such as curricula and course goals expressed in documents that prescribed the knowledge, understanding, skills, and experiences that a student should acquire and develop. The teachers and students are two sets of participants that form the *community* and are assigned tasks according to the *division of labour* between the participants. The *subject* refers to the students or learners, who define the *object* of learning as tasks involved in building houses, with the support of *mediating artefacts*, such as guidance from teachers and peers, and drawings.

The production activity system has different elements and rationality from the education activity. The *Rules* are not curricula or educational goals, but building regulations that must be followed when building the houses. The site manager, architect, students, teachers and other professionals involved in the building, e.g. plumbers and electricians, form the *community*, and their professional competences determine the *division of labour*. The *subject* refers to the site manager who is responsible for the production. The *object*, here the performance of tasks, is done with the help of the *community*, using *mediating artefacts*, such as drawings and instructions.

Apprenticeship

In the apprenticeships, the production activity is guided by *rules*, such as building regulations and agreements between the construction workers' trade union and construction industry. In a typical construction site (and sites attended by participants in the studies underlying this thesis), a site manager and various professionals form the *community*, and again their competences determine the *division of labour*. All buildings have a commissioner who expects the ordered building to be delivered on time. In this production activity system, the site manager is seen as the *subject*, while *mediating artefacts* such as the payroll system¹⁷ and drawings¹⁸ contribute to the *object*, i.e. the performance of tasks involved in the building work¹⁹.

The education activity is guided by *rules* including the requirements to meet learning goals, fill in a time sheet²⁰ and record each apprentice's progress in a following-up document based on the construction agreement (Byggnads, 2010). The *labour* (tasks and responsibilities) is *divided* within a *workplace community* consisting of the apprentices, supervisor and co-workers. In the educational activity system, the apprentice is the *subject*, who strives to reach the *object* (learning from tasks that results in a professional certificate) using intangible *mediating artefacts* such as the project and guidance.

Forms of learning

The forms of learning concepts described by Ellström (2001) were used in analysis of the data in relation to RQ2. These include adaptive and

¹⁷ The payroll system could also be seen as an element of the *Rules*, but in this thesis it is treated as a mediating artefact.

¹⁸ The ability to read drawings was highlighted as a key competence by Hoffrén-Larsson (2004).

¹⁹ A building can be any kind of object that a construction worker may build. See the Introduction for examples.

²⁰ Decided in 1967 and introduced in 1968 (Hoffrén-Larsson, 2004).

developmental learning, which can be further divided into reproductive learning, two types of productive learning, and creative learning (Table 1).

The learning of the participants in the studies this thesis is based upon is regarded as adaptive-reproductive or adaptive-productive, which are classified as “lower” and “higher” learning forms, respectively (Ellström, 2001). The lower, reproductive learning involves pre-specified tasks with given methods and a given result, so the learners have little impact on their situation. However, although reproductive learning is considered a lower form of learning it is still essential, as it may be required to solve future problems (Ellström, 2001). In the higher, productive learning, the learner identifies and prepares the task, chooses the method and is (thus) more responsible for the result. In contrast to reproductive learning, it allows the learner to influence the learning situation. Productive learning requires interpretation, understanding and acceptance of the formulated learning object by the participants. The complexity involved in setting goals, solving the task and evaluating the results will determine what kind of learning can be developed (Ellström, 1996). An important factor for productive learning is the ability of the learner to control the ‘work’ in reasonable ways. Hence, to enable that level of learning it is important to adapt the complexity of tasks in accordance with the learners’ growing ability to perform them (Ellström, 2001).

Ellström also argues that a learning process should ideally involve a combination of several forms of learning, and learning of any form is influenced by the context. Based on Ellström’s (2001) definitions of reproductive and productive learning (and their sub-types), learning can be divided into four “levels”, as shown in Table 1.

Table 1. Levels of learning according to Ellström (2001).

<i>Aspects of the Work-Learning Situation</i>	<i>Levels of Learning</i>			
	<i>Adaptive Learning</i>		<i>Developmental Learning</i>	
	(1) <i>Reproductive</i>	(2) <i>Productive, Type I</i>	(3) <i>Productive, Type II</i>	(4) <i>Creative</i>
Tasks	Given	Given	Given	Not given
Methods	Given	Given	Not given	Not given
Results	Given	Not given	Not given	Not given

In a school situation, such as in the PBVET considered here, the student may be responsible for identifying a task, the appropriate method for achieving the desired result and performing the task, thereby meeting all the requirements

for productive learning. In the apprenticeships considered here, performing work-based tasks as rapidly as possible may also promote a higher level of learning, as identifying, performing, and assessing the tasks are crucial for rapid production. Thus, these conceptual aspects of learning levels (tasks, methods and results) are used in the analytical sections of the thesis to identify and characterize ways that school and work life can enable different forms of vocational learning.

Theoretical reflections

The initial idea was to apply a didactical approach in the analysis of learning in the focal PBVET, and subsequently the concept of a workplace curriculum presented by Billett (2001) was considered. However, these theoretical ideas were rejected and the first study (of PBVET in the upper secondary education) was initiated without a clear theoretical foundation. So, after the first round of data collection, the empirical material that emerged was analysed inductively. The search for a suitable theory ended following the discovery of activity theory (Engeström, 1987, 2001) and Vygotskij's (1978) idea of the zone of proximal development, which helped to bring some clarity and understanding of the data. This abductive approach was particularly helpful in the initial stages, where my understanding of different theories allowed me to view the collected data from different perspectives.

In the second study (of learning in the apprenticeship setting), the workplace curriculum concept and its components emerged as a suitable theoretical framework for understanding vocational learning in work life. Hence, a more deductive approach was applied, where the theoretical awareness influenced the interview guide and (hence) the emerging data. From a reflective perspective, the different approaches in the two studies may have enhanced the richness of data. On the other hand, theories that are suitable in one study might not be suitable in another, for example use of the workplace curriculum concept appeared to be suitable in the second study, but not the first.

Two models that can aid understanding vocational learning in school and work life have also been modified, based on existing theories. The first, based on Ellström's (1996) model of learning levels, was initially presented in Article I and introduced a productive learning level in which the task and results are controlled but there is freedom to choose methods. Recognition of this type of learning can aid understanding of vocational learning in VET areas where problem-solving activities occur. Thus, this model can aid understanding of how freedom in activities may promote productive learning when the method is not given. This was exemplified by students' remarks in Article I, that they knew other ways of performing tasks, i.e. different methods to perform the

same task. However, as shown in that article, this freedom was rare and only occurred during tasks that they referred to as easy. In the second study this freedom was more pronounced and the apprentices referred to the payroll system as an artefact that encouraged development of methods to perform tasks more rapidly. Thus, regardless of whether or not a higher level of learning is developed, it is possible to discern sub-levels within learning levels.

The second modified theoretical model was presented in Article IV, and based on the workplace curriculum concept (Billett, 2001). There was no initial intention to test the validity of the theoretical framework in the early stage of data collection, but it was extended because it lacked educational aspects required to analyse the data fully. These aspects concern educational goals and the timeframe, which (it is argued) affect the types of activity (task, performance, guidance and assessment) that the learners perform. So, without discarding the idea that working and learning are interdependent, this model adds complementary aspects that can enhance understanding of education in work life.

5. Research design

Although the Swedish construction industry is very extensive and encompasses many orientations (SOU, 2002:115), this thesis focuses largely on students/apprentices who are becoming woodworkers. There were four reasons for this restriction. First, it is the most common orientation among those becoming construction workers (SCB, 2012). Second, completion of a vocational programme in upper secondary school followed by apprenticeship in work life is the most common path to a professional certificate (SCITB, 2013). Other options, such as distance education and upper secondary apprentice education (USAE),²¹ are adopted by approximately 2% (SCITB, 2013) and 4%, respectively, of the total number of people who enter the profession (The National Agency for Education, 2016). Third, there have been few empirical studies of construction workers' apprenticeships. Finally, I had prior understanding of the field through being a former construction worker and a vocational teacher in the profession. So, the empirical work focused on students who participated in PBVET²² and an apprenticeship oriented towards becoming woodworkers. The empirical data were collected in two studies when the students were in the PBVET and work life phases of their vocational training (see Table 2). Articles I and II are based on Study 1, while Articles II and III are based on Study 2.

Table 2. An overview of data collection in study 1 and 2.

	Data	Data collection I	Data collection II	Amount of data	
	Study 1	Observations	8 + 4 weeks		
	Focus group interviews	5 with 3 students/group		65-80 minutes/ interview	
	Individual interviews	3 with teachers		65-80 minutes/ interview	
Study 2	Data	Data collection III	Data Collection IV	Amount of data	Article III and IV
	Individual interviews	11 apprentices		35-50 minutes/ interview	
	Survey	11 apprentices			

²¹ USAE is a form of upper secondary school where the vocational subject is performed in work life.

²² In article I, Project-based learning environment (PBLE) was used as a way of explaining the educational setting. PBLE was called PBVET in article II and henceforth used in the following texts.

The data collection procedures applied in each study are more thoroughly described in the next sections.

The first study

In the first study, documents²³ were collected, observations were made and stimulated recall interviews (SRI) with vocational teachers and students were performed. The conversion of observations into adequate themes for SRI required knowledge of, and competence in, the specific fields. As Johnson (2013, p. 365) argues: “there is certainly much research to support the view that expert reasoning is not a formal matter but that what is important is familiarity with detailed, domain-specific knowledge”. Accordingly, my background as a construction worker and a vocational teacher helped me to identify the relevance of observations and formulate relevant questions in the interviews.

The informants in this study were students who were members of a cohort that followed the 1994 curriculum and their vocational teachers. The school context referred to in this thesis is related to the structure associated with that reform. This study began with pilot observations, which were included in the empirical material, and a pilot interview. Following consideration of the results, further observations in the main study were noted using a computer rather than pen-and-paper, and minor changes were made to the presentation of themes in SRI, which made the language (derived from field notes) more similar to the spoken word.

The observations were made at a PBVET work site, and focused on the opportunities of 15 construction students and their teachers to act within the educational setting, during one 8-week and one 4-week period. The observations were recorded by taking field notes that were placed in a matrix with four columns: observations (what I saw), questions (my own and others’), my own thoughts (reflections), and other (observations of activities that were not apparently linked to any school-related goals). The observations were subsequently grouped into six themes²⁴ concerning specific types of learning situations.

The identified themes were subsequently discussed by focus groups of three students in five SRIs²⁵ (see Appendix 3). The group interviews with the

²³ The documents were course syllabuses and the delegation of authority.

²⁴ The themes were: engaging in task, redoing assignments, engaging in a problem-solving task, trust in the teachers’ professional competence and behaviour, the consequences of disinformation and interruptions, and following up.

²⁵ Including one pilot interview.

construction students lasted between 65 and 80 minutes and were recorded by both a digital voice recorder and a computer. This redundancy was important as the computer, the primary recording device, failed during one interview. The interviews with the teachers covered the same themes, but were conducted as individual interviews. The SRI procedure is based on the idea by Blooms (1953) that a stimulus can trigger a person to recall something that happened. Bloom concluded that recording and displaying audio and/or video are probably the best ways to trigger such recall. However, Bloom (1953) did not exclude any methods that could be used in a SRI. So, using thematised field notes from observations in SRI is potentially valid, but caution is required as no observer can observe everything (Atkinson and Hammersley, 2007), and notes will inevitably reflect the researcher's judgements about the relevance of observed phenomena (Wolfinger, 2002). Thus, my ability to capture activities during the observations, and my judgement, presumably affected my field notes and (thus) the SRI.

By collecting data before deciding the theoretical framework a “facts-before-theory sequence” was followed, which can be justified as “...a search for the understanding of empirical phenomena that gives explanatory theory construction its point” (Haig, 2005, p. 371). This approach to the empirical data follows an inductive logic by doing observations and interviews, taking field notes and asking open-ended questions, forming themes and applying them in a theoretical framework (Creswell, 2014). In this study both activity theory (Engeström, 2001) and forms of learning (Ellström, 1996) were subsequently used as theoretical lenses in analysis of the data.

The second study

The second study was based on documents²⁶ related to the apprenticeship, individual interviews and a survey of 11 apprentices' views.²⁷ The interviews were semi-structured, involving use of a core set of questions, but retaining opportunities to explore new themes and/or identified themes more fully. The apprentices were all working in different workplaces and the interviews were structured to allow both capture and comparison of their individual thoughts and experiences. In the survey the apprentices were asked to answer three questions regarding each of the 64 general learning goals (presented in Appendix 1) describing the kinds of competences that a certified construction worker should have developed (see Appendix 2).

²⁶ The documents were the description of goals, the time sheet and the planning and follow up document.

²⁷ Eleven of the 15 students who participated in the first study.

The data collection comprised interviews and a survey regarding the apprentices who are performing their apprenticeship in the construction industry. In contrast to the first study, a theoretical framework — based on the previously discussed theoretical concepts of a workplace curriculum (Billett, 2001) and forms of learning (Ellström, 2001) — was used to guide the collection of empirical collection of data through the construction apprentices' interviews and survey. Thus, this study followed a more deductive approach, where the theoretical framework was used as a lens that guided the formulation of interview questions and hence the categories that emerged from the data (Creswell, 2014).

The interviews, in the later part of the participants' apprenticeships, were between 35 and 55 minutes long, and recorded on a digital voice recorder. The interviews were carried out with the 11 apprentices who were working in the construction industry at the time of data collection. As in the first study, the interviews were semi-structured (see Appendix 4), as openness provides opportunities for discovery of views that may be overlooked by the researcher (Ryen, 2004), but important information may be missed if there is no structure. So, semi-structured interviews that followed a specific pattern but enabled informants to express views that could otherwise have been neglected seemed most appropriate.

Based on the information that emerged during the interviews a survey was constructed and handed out to each of the 11 apprentices, after their interviews, addressing their perceptions of the 64 educational goals specified by the SCITB. Three questions regarding each of these goals were asked, to enhance understanding of: (1) the apprentices' vocational knowledge, (2) their perceptions of the importance of each goal, and (3) their thoughts about how workplaces could provide them with such knowledge. All 11 informants filled in the survey, enabling me to identify patterns in the answers (which was important as the small number of informants hindered use of statistical analysis).

Design reflections

Although data have been collected in a known environment, and arguments supporting the benefits of familiarity with the research field have been highlighted, my background probably blinded me to aspects that I might have regarded as "natural". Another personal response (related to my background and prior understanding) that may have influenced my interpretation of observations, was frustration engendered by my role as an observer preventing interference when I observed activities that raised concerns. In that sense, my background sometimes conflicted with my role as a researcher.

I may also have interfered as an observer through the anxiety, expressed by some students, that I may tell their teachers what I observed, and thus affect their grades. They were assured that my notes would not be shown to the teachers. This issue may, of course, have affected the activities, but several students acknowledged in the interviews that the identified themes reflected general patterns.

During the data collection in Study 1, field notes were used in stimulated recall interviews (SRI). This followed Bloom's (1953) idea of SRI, in seeking to trigger informants' responses by something they had all experienced. Using field notes rather than authentic video or audio recordings (cf. Alexandersson, 1994; Haglund, 2003) enabled use of observations collected over longer times than observations of isolated actions, and hence (potentially) richer discussions. Moreover, it may have helped informants to focus on the identified themes and learning occasions, rather than who did what at a specific time.

Although the described use of SRI has advantages, some weaknesses can also be identified. Notably, using field notes may constrain the informants' stimuli because their memories might not be triggered in the same way as by video and audio recordings. Another weakness is that field notes are based on the researcher's ability to observe and record focal activities. Thus, the researcher's subject knowledge and selection of what to note are important factors when field notes are used as stimuli in SRI.

Ethical considerations

To ensure the informants' integrity and confidentiality, ethical guidelines published by Vetenskapsrådet (2011)²⁸ were followed throughout the research. The informants (students and teachers) were informed that they were research subjects, the students also signed a letter of consent after being verbally informed about the project and their rights to withdraw at any time without explanation (see Appendix 5). By highlighting the ethical aspects and respecting them throughout the studies, the intention was to minimize risks of negative consequences for the participants. The ethical aspects highlighted by Vetenskapsrådet (2011) were also repeated to the informants before each interview. The informants have been anonymised by giving them fictional names, and all collected data have been stored in external facilities. Furthermore, in Articles I and II, the site manager and/or architect were referred to using their functions rather than names. However, awareness of

²⁸ The guidelines by the Swedish Research Council set out guidelines and rules for research according to the Ethical Review Act (2003:460).

the potential difficulties of maintaining confidentiality during data collection is important, particularly in studies with small numbers of participants (Johansson, 1999). Thus, I continuously strove to avoid emphasising information that could be linked to a specific informant in the analysis and presentation of results, and to honour my promises (mentioned above) not to gossip about any observations with the students' teachers, or name any participant.

6. Summary of articles

This thesis addresses vocational learning in two work-based contexts, vocational education and training (VET) in school and in work life, based on studies presented in four appended articles that are briefly summarized below.

Article I

Article I, entitled *Vocational education in practice: a study of work-based learning in a construction programme at a Swedish upper secondary school* deals with relations between educational goals, the educational context and learners' expectations. A class of third (final) year students in upper secondary school was observed. From the field notes six themes emerged: engaging in task, redoing assignments, engaging in a problem-solving task, trust in the teachers' professional competence and behaviour, the consequences of disinformation and interruptions, and following up. These themes were used in stimulated recall group interviews. The aims were to describe and analyse students' perceptions of vocational competence gained from a PBVE environment and identify how this competence is constituted.

The results show that the complexity and structure of the tasks they were assigned (in the house-building) affected the development of vocational competencies corresponding to expressed goals in course syllabuses. Theoretical reflection based on productive learning concepts (Ellström, 1996) indicates that students can develop a higher level of learning if they have possibilities to adopt new methods and solve problems that arise. However, the complexity and structure in the focal PBVET impaired their possibilities to develop such knowledge. So, rather than promoting a higher level of learning, the students' learning was mainly reproductive. In conclusion, participation in a PBVET that is hierarchically structured, with apparent tensions between production and education, limits possibilities for individual initiatives and reaching stated learning goals. Although the house-building project provided opportunities for students to perform tasks that can develop vocational competences, this article shows that they are not always compatible with competences that the students are supposed to develop. Instead, competences related to demands in the building industry are promoted, which raises concerns about the suitability of a "live" project for meeting educational goals.

Article II

The second article, entitled *Project-based vocational education and training: opportunities for teacher guidance in a Swedish upper secondary school*, describes and analyses teachers' perception of opportunities for teacher guidance provided in the PBVET. Hence, the article addresses the vocational teachers' perspective of being an educator and effects of their possibilities to educate on the students' learning outcomes. Stimulated recall interviews were used to collect data, applying the themes mentioned in Article I, and third generation activity theory (Engeström, 2001) to describe and analyse the teachers' perceptions of opportunities to provide guidance in the PBVET. The results indicate that the teachers' ability to provide guidance was hampered by a conflict between their ideas about how to perform tasks and the site manager's ideas about delivering the project. So, teacher guidance was hampered by a lack of communication between members of the community in the activity system (Figure 3) and the teacher's subordinate position, imposed by the delegation of authority. Thus, the crucial interaction for successful boundary crossing (Star and Griesemer, 1989) between the activities was not established. For example, there were challenging deviations between building regulations and the site manager's demands. So, there were conflicting objects based on different (educational and production-oriented) rationalities. Finally, teacher guidance was impaired by the delegation of authority restricting the teachers' ability to act as teachers, highlight right and wrong practices, and make authoritative decisions.

Article III

The aim of this article, entitled *Vocational learning in a Swedish post-secondary apprenticeship*, was to identify how vocational learning is constituted within workplace activities. Empirical material was collected in interviews with apprentices employed in the construction industry and a survey of their views of learning goals reflecting expected knowledge of a construction worker with a professional certificate. Both the data collection procedures and subsequent analysis were based on concepts of a workplace curriculum (Billett, 2001) and forms of learning (Ellström, 2001). The results show that affordances for vocational learning are constituted through participation in workplace activities that are guided by more skilled co-workers. The apprentices were also encouraged to develop methods to speed up production, which promotes a higher productive form of learning (cf. Ellström, 2001). An important mediating factor between the encouragement to develop methods and the learning is the payroll system, as increases in productivity increase pay. However, expressed learning goals are not focal concerns in this context, although the survey shows that the apprentices

highly value them. Thus, affordances in workplaces and their individual goals interactively influence their vocational learning, and both indirect and direct guidance related to the apprentices' own goals are important elements of a successful learning outcome. In conclusion, this article identifies four key aspects of vocational learning afforded in apprenticeships: the importance of guidance in the workplace, the possibility to perform and successfully complete complex tasks, opportunities to develop methods (which promote higher learning), and opportunities to participate in work processes.

Article IV

The fourth article (co-authored with Per Kristmansson) is entitled *Learning as an apprentice in Sweden: a comparative study on affordances for vocational learning in school and work life apprenticeship education*. The aim of this article was to deepen ongoing discussion of education in workplaces in VET research (cf. Schaap et al., 2012; Zitter et al., 2016), by exploring affordances for vocational learning in two contrasting educational settings (of business and administration students in an upper secondary apprenticeship education program and apprentices employed in the construction industry). In both settings, learning goals have been explicitly expressed, but the results show that they are not focal concerns in either case. Instead, workplace activities and individual goals are the driving forces of vocational learning. To facilitate further exploration of the effects of affordances for learning in apprenticeship-based education a model is presented that includes both education and work, i.e. an apprenticeship curriculum. Thus, this article contributes to understanding of how a learning outcome in work life is related to educational goals that interact with individual and workplace goals.

7. Analysis and discussion

This final chapter presents an analysis and discussion of vocational learning in school and work life, based on the appended articles, which addressed the previously stated research questions: RQ1, *How do work-based activities enable vocational learning?* and RQ2, *What forms of learning are enabled in school and work life settings and how are these forms of learning constituted?* The analysis is rooted in the presented theoretical framework constructed from activity theory (Engeström, 1987, 2001) and forms of learning concepts (Ellström, 2001). In the last part of this chapter, ideas for future research are outlined.

Contradictions enabling vocational learning (RQ1)

The vocational learning provided by the work-based activities observed in the school context (PBVET) and work life context (apprenticeship) are first considered separately and subsequently together in the following sections.

School as a setting for vocational learning

If education and production are integrated activities that form a joint constructed object, they could synergistically contribute to learning, but identified tensions between them raise concerns. In school, completing courses and meeting stated learning goals are key objectives. However, conflicts between education and production logics (and hence between the expressed learning goals and production goals) in the studied PBVET were identified (Article I). Thus, there is clear tension within the learning context of this PBVET, and according to Engeström's (2001) third generation of activity theory (Figure 3), it generates at least two (education and production) activity systems (Figure 4).

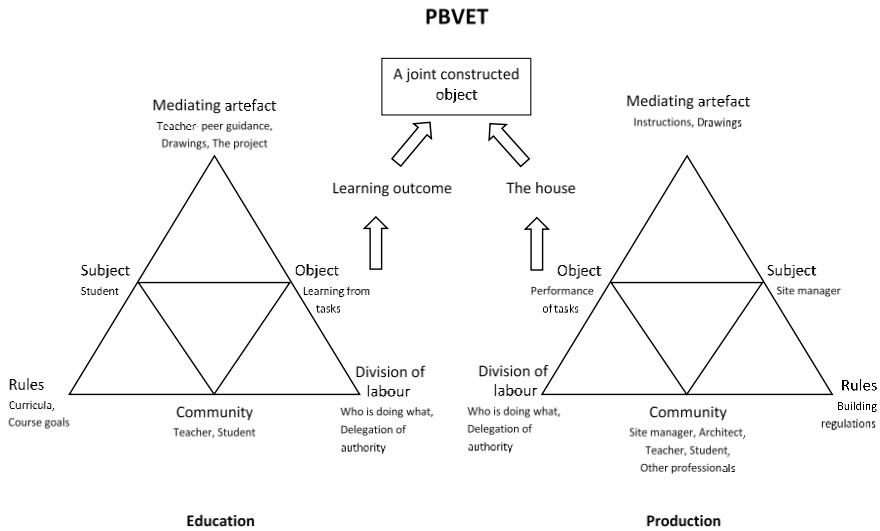


Figure 4. Activity systems in the focal PBVET.

Based on the displayed theory, the objects in education and production activities, will be further elaborated from the identified similarities and differences. So what are the central tensions in this PBVET? The object of education and the object of production can be seen as having separate motives. *Learning from tasks* is central in an educational perspective whereas the *performance of tasks* is central in production. So, the teachers intend to educate students according to curriculum and course goals, which Article II raises concerns about, but have little authority or opportunity to provide guidance, as the delegation of authority favours the site manager and (hence) prioritises production. The project is the main mediating artefact that enables the students to learn from the performance of tasks. However, the ability to learn by performing tasks is governed by the activities involved in production, where the performance of tasks is the main aim (cf. Article II). Drawing on that insight, production motives overrule educational motives, creating a tension that does not necessarily enhance the learners' possibilities to learn.

The division of labour (who does what) follows patterns similar to those in work life, where the employees perform tasks they are familiar with and specialize in (cf. Berglund, 2009). As shown in Article I, the outsourcing that is a common trend in production is also an important constraint, as different companies are brought in to tackle increasing numbers of standard tasks (which the students should learn to perform). For example, the site manager hired an external company to install windows, justifying the decision by the need to meet quality requirements. This clearly shows that production motives contribute to tension between meeting learning goals by allowing

students to perform common tasks in the construction industry and production goals. Thus, the tasks that students can perform (and learn how to do) are restricted, and the PBVET only partially provides tasks corresponding to the stated learning goals. Assuming that a learner must perform a task in order to learn it (Dewey and McClellan, 1889), learning outcomes matching goals in course syllabuses can only be reached for tasks that are actually afforded. Consequently, this PBVET develops task-specific skills that relate to what the students have been able to perform. A further constraint was that both the students and vocational teachers who participated in the first study engaged in an ongoing project, and it was impossible for the students to perform tasks that had already been completed, or had not yet started.

Regarding the local history of this PBVET, previous decisions clearly affected the educational structure and (hence) the students' learning outcome in several ways. First, the availability of building plots was crucial for a PBVET designed to both accommodate increasing numbers of students and meet criticism from the construction industry that too easy objects were built. Second, the delegation of authority affected the hierarchy of the community and (hence) the students' possibility to perform tasks and the teachers' abilities to provide guidance and influence selected practices. The suitability of this hierarchical structure is questionable. However, the prioritisation of production is a common pattern in work life, and according to Berglund (2009) a historical legacy in the construction industry.

Work life as a setting for vocational learning

Meeting goals based on knowledge and skills that a construction worker should acquire during his/her education was examined in the second study, but none of the participating apprentices were even aware of the existence of such goals (Article III). Clearly, knowing and understanding the aims of an apprenticeship is important (Hoffrén-Larsson, 2004), so the goals have dubious utility if the apprentices (who are supposed to reach them) do not know them. Thus, the lack of knowledge regarding what should be learned and the apprenticeship's aims highlights possible tension between learning goals and practical goals in the apprenticeship. Moreover, performing work-based activities and ticking hours in the educational logbook are the core requirements in the apprenticeship, so reaching learning goals is arguably secondary. According to Engeström's (2001) third generation of activity theory, the education and production activity systems in the apprenticeship can be illustrated as shown in Figure 5.

not promote learning, but it will probably increase the chances of apprentices trying new tasks or methods, and hence learning new things. In that sense the payroll system increase their possibilities for learning as a mediating artefact.

School and work life as settings for vocational learning

As already mentioned, the objects in the education and practice activity systems are based on different rationalities, and they also differ in the two contexts — school (PBVET) and work life — where learning occurs. In activity theory terms, both activity systems in both contexts are associated with goals, divisions of labour, rules, an object, a subject, and mediating artefacts that collectively determine the affordances for learning. Education through performance of work-based tasks is a common core that guides learning in both contexts. However, a difference is that in school, learning can be viewed as education by production and in work life learning can be viewed as production while being educated.

So, one conclusion from the two studies is that this PBVET contributes to the development of skills that do not fully meet the criteria in the course syllabuses. However, the apprentices expressed beliefs that they had skills corresponding to described goals, but still much to learn. Thus, it can be argued that a PBVET and the apprenticeship jointly provide a learning outcome that corresponds to skills a construction worker should have. So, despite the problems of reaching goals in course syllabuses during the PBVET, and lack of awareness of the learning goals in their apprenticeship, the students appear to develop vocational skills and knowledge corresponding to professional expectations by the time they have ticked-off the hours required for a professional certificate. For example, spatial skills that were difficult to develop in the PBVET were crucial for performing tasks in work life, and the combination of learning how to read drawings in school and performing tasks by following drawings in work life likely promotes the development of sufficient skills. In such cases the objectives in each context overlap, thereby creating a vocational learning outcome in the form of a joint constructed object (Engeström, 2001).

The work underlying this thesis has identified ways in which educational contexts may promote (or hinder) learning. In a school setting, curricula and course syllabuses guide, or should guide, the students' education, while workplaces (in the Swedish construction sector) are guided by goals that are set out by the construction industry and trade union. Nevertheless, there are similarities in the learning structures. Learning through participation in common tasks in the construction industry is a core element of the educational object in both contexts. However, regarding what to learn, identified

structures and slow progress in the PBVET reduces chances for the students to meet goals in the course syllabuses. Moreover, the apprentices were unaware even of the existence of learning goals in their apprenticeship. Instead they referred to the categories in their education logbook, which is more closely related to the payroll system and common tasks in the construction industry. As Hoffrén-Larsson (2002) argues, this is far from optimal, because the aim and learning goals of the apprenticeship are much better quality criteria than a time sheet, and their importance should be highlighted to increase the quality of the education.

Constituting diverse forms of vocational learning (RQ2)

The educational pathway to becoming a construction worker involves basic training in upper secondary school and specialized training in an apprenticeship. As argued in the discussion of RQ1, these two educational contexts may contribute in different ways to vocational learning. But what forms of learning are enabled and how are they constituted? This question is addressed by analysing the forms of learning (Ellström, 2001) enabled by the PBVET and apprenticeship in the following two sections.

Vocational learning in school

As noted in the first study, in the school setting the students' activity consists of performing tasks involved in a particular phase of the production of a house, mainly following prior guidance from a teacher, and on-site instruction. According to Ellström (2005, p. 38 f) "... the learning potential of a task may be said to be a function of its complexity, autonomy and competence requirements". Moreover, performing tasks with fixed methods and a pre-determined result likely promote a "lower" form of reproductive learning (Ellström, 1992, 1996) as the task will be assigned, with instructions or demonstration for its performance, and the desired result will be explained, leaving very little scope for creativity, autonomy and productive learning.

Nevertheless, as argued in Article I, this PBVET might offer possibilities to develop a higher form of learning through participation in problem-solving activities, but as noted by Ellström (2005), the learners must be able to identify, perform and assess the tasks in order to develop such learning. No such freedom was observed, but the possibility emerged during the interviews, which supports the idea that reproductive learning is mostly developed in a PBVET. So, one way that productive learning could be enabled would be for the teachers to engage the students in efforts to solve problems. But, as shown in Article II, problem-solving activities mainly involve teacher–teacher interactions, while the required interaction between the students and more

skilled mentors (teachers) remains more of an intention than a reality. This will have consequences for learning as it restricts the students' ability to act and interact in the process, and (thus) be sufficiently challenged to develop their full potential.

Based on the idea that working and learning are linked (Billett, 2001; Ellström, 2011), one might argue that the form of learning that is developed in a PBVET constrains higher productive learning and enhances lower reproductive learning. One reason for this is related to the lack of accurate drawings, which forces students to rely on teacher guidance rather than a drawing to formulate and perform a task. Thus, it is not possible for the students to develop (for example) spatial skills (Cuendet et al., 2014) by formulating ways to perform a task from a drawing. Instead, they were shown results of similar, completed tasks. This enabled the provision of teacher guidance, and provided indications of how a task should be performed. However, the value of this approach was questioned by the students as it only shows the end results, rather than the processes involved. Moreover, the structure of the activity, which results in given tasks, methods and results when building the house will promote reproductive learning (Table 1).

Further, the outsourcing of common tasks, exemplified by the installation of windows (Article I), reduced the students' possibilities to actually perform them. Despite good intentions by the teachers to involve the students in that task, the students only received instructions about how to perform it, and it was actually performed by other people. Thus, the outsourcing of tasks involved in the division of labour excluded the students from installing windows. A teacher mentioned that students who installed windows poorly would not pass 'the window course'. However, there is no such course and the outsourcing eliminated the possibility of students actually installing any windows. Thus, it is difficult to see how the students could pass 'the course', or learn how windows should be installed by looking at already installed windows. Thus, the outsourcing restricts the students' learning outcome in relation to the knowledge and skills a construction worker requires. On the other hand, this outsourcing is consistent with ongoing trends in the construction industry, where learners are becoming specialized in few, similar tasks (Berglund, 2009), in accordance with modern companies' requirements (Byggnads, 2010).

The value of performing few, repetitive tasks in school can also be questioned because such specialization hinders development of the broad base of vocational skills that a construction worker needs. Berglund (2009) also argued that students developing few specific skills through a PBVET is problematic because "the close connection between the construction industry

and construction programme can restrict development of skills needed within the whole construction industry and the students' possibilities for further studies, as well as development of their own vocational skills" (p. 215) (author's translation). Berglund also raised concerns about the correspondence between the students' skills and skills required in work life. Accordingly, the students' ability to develop vocational skills, through performing tasks associated with a specific phase of house-building, was found to be an issue in study 1. In such cases, what is learned depends on the possibilities to perform tasks provided in the specific context and the freedom in the learning situation.

Beside the tensions between the activities considered in the discussion of RQ1, several problems related to learning can be identified. First, in the PBVET, there was a troublesome contradiction between teacher guidance and the site manager's authority to decide how tasks should be performed. Due to this ambiguity about how to perform tasks, the students developed a strategy of working slowly to minimize errors and (hence) the need to redo tasks. Another consequence of conflicting directives is that the students repeatedly performed some assignments. Such redoing of assignments can develop accumulated experience of curricular activities (Lee and Roth, 2005), but it also constrains learning by limiting opportunities to perform new tasks. However, activities that could not be related to any stated learning goals but contributed to a learning outcome were also detected. These can be referred to as *common sense* matters that a construction worker should know, e.g. how to act appropriately in a construction site.

The complexity of the construction projects was another identified issue in the PBVET, which exacerbated the tension raised by the conflict in authority between the teachers and site manager, thereby heightening students' confusion, and affecting their learning outcome (Article II).

The tensions between the education and production activity systems is problematic because they affect house production times, and thus limit the tasks that the students can perform and learn. Clearly, an underlying premise of the PBVET, that students should acquire some experience of all phases of house building, is compromised if tasks are performed so slowly that production of a house takes about 10 semesters, while the students are engaged in the project for four semesters. So, several aspects of this PBVET constrain learning corresponding to stated learning goals, and promote specialized learning (in accordance with trends in work life).

Vocational learning in apprenticeships

Vocational learning in apprenticeships is based on participation in work life through performing work-based tasks interactively with more skilled co-workers. The personal interest of apprentices in performing different tasks and the workplace's provision of opportunities to perform them seem to be the two main factors that enable vocational learning. Another important aspect is guidance from co-workers, both indirect and direct, which encourages the apprentices to perform complex tasks and helps ensure that the tasks are performed correctly. Further motivation is provided by the payroll system, which encourages the apprentices not only to perform tasks correctly but also to work rapidly, triggering the development of methods and strategies to perform tasks efficiently. In contrast to the reproductive learning identified in the PBVET (Article I), this encouragement to try new methods promotes higher productive learning.

As the apprentices perform tasks associated with the phase of the particular project they are engaged in, they perceive some tasks to be easy (with little learning value) and others as complex and 'good' for learning (Article III). However, regardless of their complexity, these tasks can be viewed as 'given' as they are dictated by the production phase, and in close collaboration with co-workers, the apprentices are guided towards a 'given' result, specified by drawings, but with some freedom to choose methods. In terms of learning forms, the performance of given tasks with given results but not given methods can be placed between types I and II of productive learning (Table 1). As shown in Article III, such learning also appears to be common in a reproductive learning environment, where routinized tasks are performed with the option of choosing methods. So, performing a routine task does not necessarily promote reproductive learning. Instead it can be argued that performing routine tasks is a central element in the process of developing productive learning (Ellström, 2005). Accordingly, developing methods to increase production in a routinized task is a way of developing productive learning.

In addition, routine tasks that the apprentices are comfortable with (requiring no guidance) are perceived as not developing any new skills. However, these tasks must be performed and they can contribute to understanding of the whole building process. If so, the apprentices can develop insights into the building process, i.e. how buildings are made and develop both reproductive and productive learning that are crucial in work (Ellström, 2011).

School and work life as settings for vocational learning

Key aspects of vocational learning related to RQ2 are the extents that school and work life afford different forms of learning. In both settings, learning is based on participation in the production of building objects, but the analysis of how they enable learning indicates that the two contexts afford different types of learning. Learning in the PBVET often results in a passive form of reproductive learning (cf. Ellström, 1996), where a teacher guides the activities by letting the students look at a finished result. In contrast, the apprentices are members of a community where they are encouraged to contribute to identification of solutions and performance of activities. Some of these activities promote a productive form of learning, where the apprentices have to be 'problem solvers', but others are routinized activities that promote reproductive learning (Ellström, 2005). So, the PBVET largely promotes reproductive learning while the apprenticeship appears to promote a mixture of reproductive and productive learning. This does not mean that the apprenticeship should be regarded as better than the PBVET. Instead, one conclusion is that the two contexts develop different types of learning that can interactively form a joint constructed object for learning. For example, the lack of opportunities to use artefacts such as drawings in the PBVET hinders the development of spatial skills, which is crucial in the apprenticeship to understand both the finished outcome of a task and how a task can be performed. However, the students learn to read drawings in school (through a course in semester one) and to use drawings in work life, illustrating how these learning contexts can synergistically support vocational learning.

Another clear difference between the two settings is in guidance. In the PBVET a single teacher generally guides a whole class of students, following a traditional school pattern, although (as shown in Article I), one group of students received 15 minutes of teacher guidance during a whole workday, which was perceived as inadequate. In contrast, the apprentices are usually guided by co-workers, and there is supposed to be a ratio of at least five workers per apprentice (Byggnads, 2010). Thus, there are greater possibilities for guidance in the apprenticeship.

In conclusion, the PBVET and apprenticeship provide authentic tasks that enable different forms of learning. In combination, the two contexts can form a joint constructed object of activities corresponding to the expected skills and knowledge of a construction worker. Moreover, in both contexts, goal-directed learning distinguishes education from merely working and performing tasks.

Credibility and generalization

The two studies have involved students/apprentices and vocational teachers as informants, various methods as well as various theoretical explanations. Such use of a variety of approaches should provide greater understanding of the studied phenomena than use of a single approach and, as argued by Denzin (2009), collecting data by different methods can validate findings. Accordingly, analysis of the different types of data has enhanced understanding of vocational learning in the two contexts, and the application of activity theory, learning forms, workplace curricula (and discarded theories, which helped hone understanding of the need for a suitable framework) has enabled analysis of the activity systems in the two contexts from multiple, refined perspectives. This has allowed development of theoretical foundations that strengthen the findings' credibility (Yin, 2003).

When considering the credibility of the findings, it is important to recognize that there is no absolute truth, as all data are interpreted somehow (Alvesson and Sköldbberg, 2008). My results have been influenced by my choices of methods, their application, and my own interpretations; before during and after data collection. By using field notes in the SRIs, and encouraging both students and teachers to discuss the presented themes, I strived to maximize credibility. Allowing the informants to consider the field notes enabled them to comment on the observation data and confirm (or refute) the validity of themes that were read to them. In addition, individual interviews and the survey conducted in the second study can be seen as increasing the credibility though use of two data collection methods. Nevertheless, as already mentioned, my familiarity with the environments (shared by my respondents), may have blinded us to important factors.

The path to becoming a construction worker addressed in this thesis has various specific features. However, the reported findings arguably have validity in other settings with similar structures. The applicability of findings from one context to another relies on "reasoned judgement about the extent to which the findings from one study can be used as a guide to what might occur in another situation" (Kvale, 1996, p. 233). The structure of the construction workers' education in both school and work life, examined here, can be found in education for other occupations (e.g. for plumbers, electricians) and likely vocational learning can be enabled in similar ways. Nevertheless, the validity and generalizability of findings depend on thick descriptions that can guide other researchers and practitioners (Kvale, 1996) in other situations (Kvale and Brinkmann, 2009).

Contribution and suggestions for further research

So far, the discussion has focused on how activities in PBVET and work life contribute in different ways to enable vocational learning (RQ1) and how these activities promote different forms of learning (RQ2). As noted in both the introduction and earlier research, school and work life are often separated, but the most common pathway to become a construction worker involves activities intended to promote learning in both school and work life settings. Thus, this thesis argues that these contexts should provide (and be seen to provide) complementary learning objects to enhance understanding of vocational learning in schools and workplaces. Moreover, many aspects of learning have been identified during the studies underlying this thesis, some of which have been unexpected.

In line with Berglund's (2009) conclusion, learning by participating in a PBVET has questionable ability to provide the skills a worker in the construction industry requires. However, although little attention is paid to educational aspects in the apprenticeship considered here, vocational learning still occurs that largely provides the expected skills and knowledge. Thus, the research, based on following a group of students in both school and work life, has complemented other studies that have focused on the construction programme (cf. Berglund, 2009; Hårdig, 1995), thereby contributing to understanding of the vocational learning pathway to becoming a construction worker.

It is also noteworthy that despite similarities in school and work life, where tasks are performed in line with the production phase, the type of guidance offered enables different types of learning. Thus, the tasks themselves do not automatically promote one or the other type of learning. Instead the mode of guidance (both indirect and direct) seems to affect the form(s) of learning afforded. This does not exclude recognition that performing tasks develops vocational skills, but the affordances for learning mediated by different types of guidance will affect the type(s) of learning that can be developed.

This thesis can be seen as contributing to filling a gap in research on vocational learning, but there are still questions to address in further studies. Notably, a change in the labour market, involving companies more frequently hiring workers for short-term contracts, has implications for the current path to becoming a construction worker (upper secondary school followed by an apprenticeship). This change should be addressed in educational research, as it may disrupt the guidance and development of students and apprentices, or require substantial adjustments of current arrangements.

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Appendix 1: Description of goals

Målbeskrivning Träarbetare

Huvudområde	Gemensamma grunder alla	
Område	Moment	Beskrivning
Bygghandlingar	Olika typer av bygghandlingar	Känna till bygghandlingars olika status, byggbranschens standardavtal, AMA, myndigheters regelverk, kontrakt och byggbeskrivningar.
Bygghandlingar	Ritningsläsning grund	Kunna; skalor, olika vyer, olika typer av ritningar, vanliga symboler, måttsättningsprinciper, ritningshuvudet och revideringar.
Byggmaskiner och verktyg	Maskiner och verktyg	Känna till hur man använder och vårdar de vanligaste handhållna verktygen och maskinerna.
Byggmaterial och yttre miljö	Byggmaterial grund	Känna till vanliga byggmaterial avseende; användningsområde, kvalitet, egenskaper, kostnader, hälso-och miljöaspekter.
Byggmaterial och yttre miljö	Miljöhänsyn	Känna till miljöledningssystem och principer för kretslopp och återvinning.
Byggmaterial och yttre miljö	Miljöhänsyn	Kunna källsortera byggmaterial.
Byggprocessen	Arbetsplatsen	Känna till: Parternas roll på arbetsmarknaden. Avtal och lagar som reglerar anställningen. Yrkesutbildningsavtalet. Arbetsplatsens försäkringar.
Byggprocessen	Byggprocessen	Känna till: Helheten och sambandet i byggprocessen. Byggprocessens olika skeden, aktörer och entreprenadformer.
Byggprocessen	Byggprocessen	Känna till byggarbetsplatsens olika yrken och roller, grunderna för samverkan i arbetslag och med olika yrkesgrupper.
Byggprocessen	Byggprocessen	Känna till regler och myndighetsbeslut som styr byggandet, kontroller, kvalitetskrav och besiktningar.
Byggteknik och beräkningar	Byggkonstruktioner	Känna till vanliga anläggning- och byggkonstruktioner och deras egenskaper/verkningsätt.
Byggteknik och beräkningar	Byggnadsfysiska egenskapskrav och lösningar	Känna till de vanligaste byggmaterialens egenskaper och användningsområden avseende värme, fukt, ljud och brand.
Byggteknik och beräkningar	Byggteknik	Känna till var man finner information om utförande av vanliga byggtekniska lösningar såsom AMA-systemet, materialinstruktioner och myndighetskrav.
Byggteknik och beräkningar	Mätningsteknik grund	Känna till de på arbetsplatsen vanligaste förekommande utsättningsmetoderna.
Byggteknik och beräkningar	Yrkesmatematik	Kunna utföra enklare produktionsekonomiska beräkningar såsom materialåtgång mm.
Byggteknik och beräkningar	Yrkesmatematik	Känna till samspel mellan produktionsteknik och ekonomi.

Hälsa och säkerhet	Arbetsmiljö grund	Känna till: Byggbranschens arbetsmiljöavtal. Arbetsmiljoregler för yngre i yrkeslivet. Människans förutsättningar och begränsningar. Arbetsmiljöorganisation. Syftet med arbetsmiljöplan.
Hälsa och säkerhet	Arbetsmiljö grund	Känna till: Arbetsmiljölagens grund och syfte. Arbetsmiljöverkets föresl (AFS).
Hälsa och säkerhet	Bära och lyfta	Kunna olika former av materialhantering; manuell och med hjälp av maskiner samt olika arbetsmetoder för att lyfta och bära rätt.
Hälsa och säkerhet	Bära och lyfta	Kunna de förekommande kranar och lyftredskaps användningsområde. Signal- och teckengivning. Lyft- och kopplingsteknik.
Hälsa och säkerhet	Praktiskt förebyggande arbetsmiljöarbete	Kunna: Första hjälpen vid olycksfall. Förebyggande brandskydd, elsäkerhet och användning av personlig skyddsutrustning. Arbetsmiljö- och säkerhetsarbete på arbetsplatsen.
Hälsa och säkerhet	Praktiskt förebyggande arbetsmiljöarbete	Känna till ergonomiska hjälpmedels funktion.
Hälsa och säkerhet	Praktiskt förebyggande arbetsmiljöarbete	Kunna tillämpa Arbetsmiljöverkets regler för skydds- och hjälpanordningar; stegar, bockar, bockställningar, tillträdes- och transportleder, skyddsräcken, skyddstak, intäckningar och arbetsställningar.
Hälsa och säkerhet	Praktiskt förebyggande arbetsmiljöarbete	Känna till de vanligaste förekommande riskerna på byggarbetsplatsen och hur man förebygger dessa.

Huvudområde **Gemensamma grunder hus**

Område	Moment	Beskrivning
Armering	Armering	Känna till armeringens funktion i betongkonstruktioner.
Bygghandlingar	Ritningsläsning husbyggnad	Kunna tolka och tyda ritningar.
Bygghandlingar	Ritningsläsning husbyggnad	Känna till olika ritningar för husbyggnad med vanligen förekommande symboler och principer för måttsättning.
Byggmaterial och yttre miljö	Material och transportteknik	Kunna volym och viktberäkna byggnadsdelar för säkra lyft.
Byggmaterial och yttre miljö	Material och transportteknik	Kunna utföra säker infästning i olika byggnadsdelar/-material.
Byggmaterial och yttre miljö	Material och transportteknik	Kunna tillämpa lämplig lyftteknik för säkra lyft i samband med uttransport av byggnadsdelar.
Byggmaterial och yttre miljö	Material och transportteknik	Kunna tillämpa transportmetoder för vanligt förekommande byggmater
Byggmaterial och yttre miljö	Material och transportteknik	Kunna tillämpa för yrket speciella föreskrifter och bestämmelser i samband med material och transportteknik med hänsyn till klimat och risk.

Byggprocessen	Arkitektur	Känna till: Arkitektens arbete och arkitekturens påverkan genom tiderna. Vanliga arkitekturtermer. Form och funktion.
Byggteknik och beräkningar	Yrkesmatematik	Kunna tillämpa och förstå den matematik som används i yrkesutövningen på arbetsplatsen.
Hälsa och säkerhet	Heta arbeten	Känna till värmeavgivning i samband med olika produktionsmetoder
Hälsa och säkerhet	Heta arbeten	Pröva på släckmedel och släckningsutrustning.
Hälsa och säkerhet	Heta arbeten	Kunna utföra förebyggande arbete och brandsläckning.
Hälsa och säkerhet	Heta arbeten	Känna till lagar, föreskrifter och anvisningar, försäkringsvillkor, brandrisker och säkerhetsregler.
Hälsa och säkerhet	Maskiner och verktyg	Kunna använda ergonomiska hjälpmedel.
Hälsa och säkerhet	Ställningsbyggnad	Kunna montera systemställningar av stål/metall upp till 9 meters höjd, enligt AFS allmän utbildning.
Isoleringsarbete	Isolering	Kunna de teoretiska sambanden gällande värme, fukt, ljud och brand.

Huvudområde		Kunskapsområde
Område	Moment	Beskrivning
Byggteknik och beräkningar	Mätningsteknik	Kunna sätta profiler för utsättning av grundläggning.
Fasader	Väggbeklädnad	Kunna utföra utvändiga beklädnader med förekommande material; skivor av trä, gips och fibercement, stående och liggande panel av trä, montage av profilerad plåt.
Inredning	Snickerier och inredning	Pröva på: Montage av fönster, dörrar och inredning. Tillpassning och montering av lister, foder, sockel, taklister och paneler. Montage av beslag och annan utrustning.
Invändigt ytskikt	Montage	Kunna utföra montage av invändig träpanel.
Invändigt ytskikt	Snickerier	Kunna utföra: Montage av skåpinredningar. Uppsättning av taklist, sockel, foder, smyggar och paneler. Montage av beslag.
Invändigt ytskikt	Ytskikt på golv	Kunna utföra läggning av massiva trägolv och laminatgolv.
Isoleringsarbete	Isolering	Kunna utföra isoleringsarbete med hänsyn till värme, fukt, ljud och brand.
Stomkomplettering	Montage	Kunna utföra montage av icke bärande innervägg med stomme av trä- respektive plåtreglar och beklädnad med skivmaterial av gips, trä eller fibercement.
Stomkomplettering	Montage	Kunna utföra montage av skivor i tak.
Stomkomplettering	Montage	Kunna utföra montage av fönster och dörrar.

Stomkomplettering	Undergolv	Kunna utföra läggning av undergolv av trä och träbaserade skivor.
Stomkomplettering	Väggbeklädnad	Kunna utföra invändiga beklädnader med förekommande material; skivor av trä, gips och fibercement, stående och liggande panel av trä.
Stomme	Bjälklag	Kunna utföra lastspridande åtgärder i bjälklag såsom krysskolvning och skruvlimning m.fl.
Stomme	Formbyggnad	Kunna utföra formsättning med såväl prefabricerade formar som platsbyggd form för väggar, pelare, balkar, lågform och raka trappor samt kunna sätta profiler för utsättning av grundläggning.
Stomme	Formbyggnad	Känna till formtryck i betongformar och påfrestningar i samband med gjutning och vibrering av betong.
Stomme	Prefab	Kunna utföra platsbyggda elementkonstruktioner.
Stomme	Prefab	Kunna utföra montage av element såsom väggar, bjälklag och takstolar.
Stomme	Stombyggnad trä	Kunna utföra stombyggnad av träreglar såsom ytterväggar, bjälklag och tak, avvaxlingar och andra förstärkningar.
Stomme	Stombyggnad trä	Kunna utföra infästningar, förankringar och skarvförband.
Stomme	Stomstabilisering	Kunna utföra stomstabilisering under montage samt permanent.
Yttertak	Montage	Kunna utföra: Montage av yttertak med råspont, skivmaterial och folie. Läggning av underlagspapp.
Yttertak	Säkerhetsarbete	Kunna utföra säkerhetsarbete på tak såsom skyddsräcken, tillträdesleder, övertäckningar mm.
Yttertak	Taktäckning	Kunna utföra montage av bärande underlag för ytskikt av tegel, plåt och andra förekommande tätskikt.

Appendix 2. Survey apprentices

Lärande genom en lärlingsanställning

Hej

Du har tidigare deltagit i en intervju kring hur du uppfattar att din arbetsplats kan erbjuda möjligheter att bli byggnadsarbetare genom en lärlingsanställning. För att ytterligare belysa hur du uppfattar den målbeskrivning som finns till hjälp för din lärlingsutbildning skulle jag vilja att du fyller i följande enkät.

Enkäten utgår från den målbeskrivning som Byggnadsindustrins Yrkesnämnd (BYN) har satt upp för vad en träarbetare bör kunna. Enkäten avser att svara på följande tre frågor:

- I vilken grad anser du att det är viktigt för dig att känna till eller kunna dessa mål?
- I vilken grad anser du dig ha kunskap om dessa mål?
- I vilken grad erbjuder din arbetsplats möjligheter att utveckla dessa mål?

Enkäten är utformad på följande sätt: målbeskrivningen innefattar 64 olika mål. Varje mål kommer att relateras till de tre frågorna som enkäten avser att besvara. Dina svar ska graderas utifrån en fyrgradig skala från mycket låg grad till mycket hög grad.

Gemensamma grunder alla

Känna till bygghandlingars olika status, byggbranschens standardavtal, AMA, myndigheters regelverk, kontrakt och byggbeskrivningar.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna; skalor, olika vyer, olika typer av ritningar, vanliga symboler, måttsättningsprinciper, ritningshuvudet och revideringar.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till hur man använder och vårdar de vanligaste handhållna verktygen och maskinerna.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till vanliga byggmaterial avseende; användningsområde, kvalitet, egenskaper, kostnader, hälso-och miljöaspekter.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till miljöledningssystem och principer för kretslopp och återvinning.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna källsortera byggmaterial.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till: Parternas roll på arbetsmarknaden. Avtal och lagar som reglerar anställningen. Yrkesutbildningsavtalet.

Arbetsplatsens försäkringar.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till: Helheten och sambandet i byggprocessen.

Byggprocessens olika skeden, aktörer och entreprenadformer.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till byggarbetsplatsens olika yrken och roller, grunderna för samverkan i arbetslag och med olika yrkesgrupper.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till regler och myndighetsbeslut som styr byggandet, kontroller, kvalitetskrav och besiktningar.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till vanliga anläggning- och byggkonstruktioner och deras egenskaper/verkningsätt.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till de vanligaste byggmaterialens egenskaper och användningsområden avseende värme, fukt, ljud och brand.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till var man finner information om utförande av vanliga byggtekniska lösningar såsom AMA-systemet, materialinstruktioner och myndighetskrav.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till de på arbetsplatsen vanligaste förekommande utsättningsmetoderna.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra enklare produktionsekonomiska beräkningar såsom materialåtgång mm.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till samspel mellan produktionsteknik och ekonomi.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till: Byggbranschens arbetsmiljöavtal. Arbetsmiljööregler för yngre i yrkeslivet. Människans förutsättningar och begränsningar. Arbetsmiljöorganisation. Syftet med arbetsmiljöplan.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till: Arbetsmiljölagens grund och syfte. Arbetsmiljöverkets föreskrifter (AFS).

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna olika former av materialhantering; manuell och med hjälp av maskiner samt olika arbetsmetoder för att lyfta och bära rätt.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna de förekommande kranar och lyftredskaps användningsområde. Signal- och teckengivning. Lyft- och kopplingsteknik.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna: Första hjälpen vid olycksfall. Förebyggande brandskydd, elsäkerhet och användning av personlig skyddsutrustning. Arbetsmiljö- och säkerhetsarbete på arbetsplatsen.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till ergonomiska hjälpmedels funktion.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna tillämpa Arbetsmiljöverkets regler för skydds- och hjälpanordningar; stegar, bockar, bockställningar, tillträdes- och transportleder, skyddsräcken, skyddstak, intäckningar och arbetsställningar.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till de vanligaste förekommande riskerna på byggarbetsplatsen och hur man förebygger dessa.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Gemensamma grunder hus

Känna till armeringens funktion i betongkonstruktioner.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna tolka och tyda ritningar.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till olika ritningar för husbyggnad med vanligen förekommande symboler och principer för måttsättning.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna volym och viktberäkna byggnadsdelar för säkra lyft.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra säker infästning i olika byggnadsdelar/-material.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna tillämpa lämplig lyftteknik för säkra lyft i samband med uttransport av byggnadsdelar.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna tillämpa transportmetoder för vanligt förekommande byggmaterial.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna tillämpa för yrket speciella föreskrifter och bestämmelser i samband med material och transportteknik med hänsyn till klimat och risk.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till: Arkitektens arbete och arkitekturens påverkan genom tiderna. Vanliga arkitekturtermer. Form och funktion.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna tillämpa och förstå den matematik som används i yrkesutövningen på arbetsplatsen.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till värmeavgivning i samband med olika produktionsmetoder.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Pröva på släckmedel och släckningsutrustning.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att prova ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra förebyggande arbete och brandsläckning.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till lagar, föreskrifter och anvisningar, försäkringsvillkor, brandrisker och säkerhetsregler.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna använda ergonomiska hjälpmedel.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna montera systemställningar av stål/metall upp till 9 meters höjd, enligt AFS allmän utbildning.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna de teoretiska sambanden gällande värme, fukt, ljud och brand.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunskapsområde trä

Kunna sätta profiler för utsättning av grundläggning.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra utvändiga beklädnader med förekommande material; skivor av trä, gips och fibercement, stående och liggande panel av trä, montage av profilerad plåt.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Pröva på: Montage av fönster, dörrar och inredning. Tillpassning och montering av lister, foder, sockel, taklistor och paneler. Montage av beslag och annan utrustning.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att prova ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra montage av invändig träpanel.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra: Montage av skåpinredningar. Uppsättning av taklist, sockel, foder, smygar och paneler. Montage av beslag.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra läggning av massiva trägolv och laminatgolv.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra isoleringsarbete med hänsyn till värme, fukt, ljud och brand.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra montage av icke bärande innervägg med stomme av trä- respektive plåtreklar och beklädnad med skivmaterial av gips, trä eller fibercement.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra montage av skivor i tak.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra montage av fönster och dörrar.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföraläggning av undergolv av trä och träbaserade skivor.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra invändiga beklädnader med förekommande material; skivor av trä, gips och fibercement, stående och liggande panel av trä.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra lastspridande åtgärder i bjälklag såsom krysskolvning och skruvlimning mfl.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra formsättning med såväl prefabricerade formar som platsbyggd form för väggar, pelare, balkar, lågform och raka trappor samt kunna sätta profiler för utsättning av grundläggning.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Känna till formtryck i betongformar och påfrestningar i samband med gjutning och vibrering av betong.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att känna till ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra platsbyggda elementkonstruktioner.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra montage av element såsom väggar, bjälklag och takstolar.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra stombyggnad av träreglar såsom ytterväggar, bjälklag och tak, avvaxlingar och andra förstärkningar.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra infästningar, förankringar och skarvförband.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra stomstabilisering under montage samt permanent.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra: Montage av yttertak med råspont, skivmaterial och folie. Läggnig av underlagspapp.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra säkerhetsarbete på tak såsom skyddsräcken, tillträdesleder, övertäckningar mm.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kunna utföra montage av bärande underlag för ytskikt av tegel, plåt och andra förekommande tätskikt.

	Mycket låg grad	Låg grad	Hög grad	Mycket hög grad
I vilken grad anser du att det är viktigt för dig att kunna ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad anser du att du har kunskap om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I vilken grad erbjuder din arbetsplats möjligheter att utveckla kunskaper om ovanstående mål?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Tack för att du svarat på denna enkät.

Appendix 3: Interview guide, study 1

Case 1

En elev ska montera plåtreglar och väggen som ska monteras mot är ett snedtak, vilket gör att reglarna inte räcker till på längden. En annan elev förklarar för den andra eleven hur man skarvar plåtregeln. Efter att eleven förklarat för den andra eleven hur man gör, så gör den här eleven ingenting. Han påbörjar alltså inte att skarva reglarna så att de ska räckta till. Efter att det gått en liten stund så säger den här eleven ”jag vet inte hur jag ska göra” och då intar den här eleven en inställning att ”jag vet inte” trots att han har fått förklarat för sig av en annan elev, som har gjort det förut, hur man ska göra. Eleven väljer att inte göra det.

- Hur tänker ni kring att eleven har blivit instruerad av en annan elev som säger sig veta hur man gör, men väljer att inte göra så?

Om jag går vidare, jag har berättat historien om en elev som instruerar en elev på ett korrekt sätt. Nu fortsätter berättelsen. Nu är det inte om väggen. Nu är det så här att en lärare instruerar en elev hur han ska göra för att montera ett fördelningskåp på övervåningen mot toalettväggen. Eleven gör precis som han är uppmanad att göra av läraren, men det visar sig bli fel. Eleven menar då att två lärare har sagt att han ska göra så och då är det så. Han gör precis som lärarna säger men efter lite räknande inser han att skåpet rymms i väggen utan att det behövs göras ett hål på baksidan av väggen, som enligt lärarna är för tunn för att skåpet ska rymmas. Eleven vidhåller ändå att han ska göra så eftersom lärarna har sagt åt han att göra så, trots att han börjar förstå att det kanske inte är helt rätt. Efter vi hört den första historien om plåtreglarna där en elev instruerar en annan elev, kommer vi till den andra historien när två lärare har sagt åt en elev att göra ett hål för ett fördelningskåp som inte behöver göras.

- Hur tänker ni kring det?
- Förstår ni skillnaden mellan dom här två historierna?
- Är det större risk att man måste göra om någonting om läraren inte sagt till?
- Är det viktigt att läraren instruerar?

- Vilka möjligheter tror ni att ni har att påverka, ta egna beslut kring sådana här uppgifter som uppenbart blir fel?
- Om ni skulle gradera er möjlighet att påverka och ta egna beslut. Skulle ni tycka att den är stor eller liten?
- Hur skulle ni förklara er möjlighet att påverka och ta egna beslut kring de uppgifter som ni får.

Case 2

På övervåningen i hallen blir en elev blir uppmanad av läraren att ta bort en osb-skiva som sitter monterad på ett litet smalt parti bredvid en dörr. Enligt läraren ska Osb skivan inte vara där eftersom hallen blir för smal. Läraren säger att det bara ska vara en gippsskiva på väggen. Eleven tar bort den där osb skivan som sitter uppsatt bredvid dörren, då stöter han på ett problem. Bakom osb skivan sitter det en eldosa som sitter fast i själva skivan. Eleven tar bort eldosan och sen monterar han dit den mot en stolpe i stället. För att kunna göra det måste han ta bort regeln som utgör dörröppningen, detta för att han ska komma åt att spika fast dosan. När han ska återmontera regeln vid dörren så blir han uppmanad av läraren att byta den eftersom läraren bedömer att den är för böjd. Det här tar hela resten av dagen för den här eleven att göra, eftersom eleven tycker att det är onödigt att byta den. Det tog som sagt hela dagen att ta bort osb skivan eftersom eldosan måste flyttas och regeln vid dörren måste bytas. Detta var sista dagen på veckan.

- Vad tycker ni om en sån här uppgift som den här eleven fick?

Om vi tar den här lilla grejen med att osb skivan skulle monteras bort och som egentligen medförde mer problem eftersom eleven måste fästa dosan på ett annat sätt och eleven fick dessutom byta en stolpe, det blev ju ganska mycket arbete att ta bort den där skivan.

- Om nu syftet med att ni är här är att lära sig saker. Vad tror ni att eleven lärde sig av en sån här uppgift?
- När läraren säger att osb skivan måste bort eftersom hallen blir för smal. Hur viktigt anser ni att det är att detta följs?

Den här eleven har tagit bort osb skivan, han har monterat om eldosan som satt där, han har åtgärdat den böjda regeln och sedan tog veckan slut. När eleven kommer tillbaka veckan efter, då har årskurs 2 elever varit där och

jobbat i två dagar. Dom har monterat osb skivor på nästan alla väggar och så har dom börjat gipsa uppe i hallen. Nu är det så här att årskurs 3 eleverna fortsätter att montera gips där årskurs 2 har slutat med gipsen, osb skivan ligger där bakom. När läraren kommer förbi konstaterar han att det går inte att montera dit osb skivan som saknas nere vid golvet under fördelningsskåpet eftersom rörmockaren inte har monterat dit golvslingorna, så väggen går inte att sätta igen. Läraren menar att dom får montera dit den gips som går och så får dom lämna den som är närmast skåpet. Det är samma hall där eleven tidigare monterat bort osb skivan med ganska mycket jobb som följd.

- Vad tänker ni om den här fortsättningen?
- Vad hände?

Om vi går tillbaka i historien. Första veckan fick eleven montera bort en osb skiva, hålla på med stolpen och fixa med eldosan och allt det där. Med den uppmaning av läraren att osb skivan kan inte vara där för att hallen blir för smal. Sedan kommer han dit veckan efter och då har andra elever satt osb skivor på alla väggar utom under fördelningsskåpet. Och så har dom påbörjat att gipsa väggarna. Nu fortsätter årskurs 3 att gipsa trots att de förra veckan fick en instruktion om att osb skivan inte skulle vara där.

- Varför tror ni att de här eleverna gör fel?

Läraren kommer dit och ser att det inte går att montera dit osb skivan under skåpet. Då kan man tänka sig att läraren har accepterat att en osb skiva ska vara där. Direktivet är fortfarande att det inte ska vara någon osb skiva.

- Hur ska man resonera kring det här?

Case 3

En elev vill att läraren ska titta och visa hur han ska göra en invändig fönstersmyg på toaletten uppe. Läraren förklarar hur gipsskivan ska monteras, samt hur eleven ska tänka för att det ska bli rätt. Och rätt är att det är jämt, rakt och snyggt. Och så undrar eleven hur han ska göra med dom där elrören som sticker ner. Då säger läraren till eleven: vi går och tittar i det första huset, där är smygen gjord. Läraren menar att: det är lättare att förstå hur det ska var om man ser hur det ska se ut.

- Vad tänker ni om det?

Om jag går vidare i historien, då är det så här: eleven och läraren går iväg till huset och tittar. När läraren ska visa hur det ska se ut så ser han att den är felaktigt gjord. Han ska visa hur det ska vara men ser att det är fel. Felet är att smygen ligger för nära fönsterbågen eftersom fönstret är monterat lite för högt i öppningen. En annan lärare kommer förbi och dom börjar diskutera hur dom kan lösa det här problemet. Eleven som ska göra smygen, han som följde med, han har försvunnit. Det kommer en till lärare och lärarna börjar diskutera hur man löser det här problemet samtidigt som eleven väljer att gå.

- Varför tror ni att eleven som valde att vilja ha lärare att visa och titta hur man gör, går när han ser att det är fel?
- Hur viktigt skulle ni tycka att det var att få vara delaktig i en sån diskussion eller sån problemlösning?
- Vem anser ni göra dom här problemlösningarna som sker på det här bygget?
- Hur mycket är eleverna med om det?

Om jag går vidare i den här problematiken med att lärarna börjar lösa det här problemet med fönsteröppningen. En av lärarna som diskuterar lösningen på problemet säger: "det skiter jag i, jag gör det som går att göra. Det här får arbetsledaren lösa"

- Hur tänker ni nu kring vem som löser problem?

Två lärare försöker lösa problemet varav en säger: det skitar jag i det får arbetsledaren lösa.

- Vilka konsekvenser kan det här medföra tror ni?
- Hur tänker ni nu kring vem som löser problem?

Case 4

Eleverna har påbörjat att göra invändiga sneda smygar, men jag ser att dom är väldigt irriterade detta beror på att eleverna måste göra om alla smygar, eftersom dom inte är rätt. Då ställde jag frågan: varför blev det fel? En elev menar: läraren sa att det var okej förra veckan, men har ändrat sig. Han var ju med och gjorde en och ändå blev det fel. Eleverna är inte nöjda.

- Hur tänker ni kring en sådan situation?
- Hur vanligt skull ni säga att det är att man gör om saker?
- Vad är det som avgör om det ni har gjort är rätt eller fel?

Nu går jag vidare i den här historien. Eleverna har ju fått veta att dom ska göra om allting trots att läraren var med och gjorde en själv veckan innan. Jag frågar några elever: har ni sett någon ritning på hur det här ska se ut? En elev svarar: jag tror jag har sett en. Var är den? Ingen aning, den ligger här nånstans. Vi behöver inte den för vi vet måttet. Detta var alltså fortsättningen på dom sneda fönstersmygarna. Dom gjorde som läraren först sa. Än fast läraren var med så blev det fel, och dom fick veta att dom måste göra om allt. Ritningar finns där nånstans och en elev säger: Vi behöver inte den för vi vet måttet.

- Hur kunde det bli fel?
- På vilket vis tror ni att det handlar om att bygga efter en ritning och hur kan ni det påverka om ni behöver göra om något eller inte?
- Hur viktigt är det då att man använder ritningen?
- Hur tycker ni man ska tänka när läraren säger nånting, har visat nånting, har varit med och gjort nånting och sen visar det sig vara fel? Att då använda en ritning är inte aktuellt eftersom jag vet måttet. Hur tycker ni att man ska tänka kring detta?
- Vem har mest rätt: ritningen, läraren, arbetsledaren, eleven?

Case 5

Om vi då går över till case 5. Det handlar om att eleverna får information om hur fönstemonteringen ska gå till, och det här sker i baracken, innan man går ut. Eleverna blir informerade om att de ska få vara med och titta och observera hur fönstermonteringen går till och kanske hjälpa till. Genom gången handlar även om hur fönsterna ska förberedas och eleverna får veta att dom ska snurra för att alla ska få vara med. En elev vill se ritningen på fönsterlösningen. Läraren hänvisar att det ska finnas en i varje hus, eleverna får även tips om hur dom kan göra för att smygen ska bli rak och fin samt vilka verktyg dom behöver. För att eleverna ska förstå bättre säger läraren att han ska visa hur det går till i hus 1.

- Vad tycker ni om en sån här början?
- Dom har ju fått information om vad dom ska göra för nånting.
- Hur viktig är det att få veta uppgiften innan man går ut?

Då går jag vidare. När eleverna går ut till husen visar det sig att alla fönster är monterade vilket konstateras ganska snabbt. Den gemensamma genomgången som skulle bli i hus 1 blir istället i hus 2, alltså inte där han sa att det skulle vara. Nu får samtliga en genomgång om hur dom ska tejpa skarvarna vid fönstret efter att det är monterat. Eleverna får information om att dom fönster dom gjort kommer att noteras, om dom inte klarar provtryckningen så får dom IG på fönsterkursen. Läraren visar hur tejpnigen går till och eleverna börjar tejpa utifrån lärarens instruktion. Om jag sammanfattar detta: alla fönster var monterade, trots att det var dagens uppgift och så har eleverna fått en ny uppgift som gäller att tejpa fönsterna.

- Vad tänker ni om detta?
- Hur påverkas ni av att ni får veta en uppgift och så blir det något annat?

Om vi går vidare i det hära, då är det så att eleverna har fått reda på att dom ska tejpa och läraren har visat hur man ska tejpa och eleverna har påbörjat tejpnigen. Då blir alla elever kallade till hus 2 av arbetsledaren, som meddelar att arkitekten ska komma förbi och instruera eleverna hur dom ska tejpa.

- Vad tänker ni nu då?

Det har ju kommit ny information som egentligen blir ett avbrott i tejpnigen i väntan på den här arkitekten.

- Vad tänker ni på det här avbrottet som sker?
- Hur kan man tänka då?
- Påverkar det eleverna på något vis?

Om vi nu går vidare. Nu har klockan blivit ett på den här dagen och arkitekten har kommit. Läraren, arbetsledaren, arkitekten håller nu själv på att komma överens hur dom ska göra för att lösa fönsterkonstruktionen och genomföra drevningen runt fönstret samt tejpnigen. Nu står dom tre vid ett fönster och

håller på med detta. Eleverna, dom får vänta i en timme eftersom dom har ju avbrytit tejpningen för att arkitekten ska visa hur det går till. Klockan 14 då får alla en genomgång av arkitekten, kring hur dom ska tejpa. Detta tar cirka en timme. En elev menar att det är ju bara att tejpa, vilket arkitekten instämmer i.

- Hur tänker ni kring att läraren först instruerar hur eleverna ska tejpa och sedan får dom order om att vänta på en arkitekt?

Eleverna vart ju instruerad av läraren: tejpa så här, eleverna börjar tejpa och arbetsledaren säger nej, vi måste vänta på arkitekten, som nu säger att det är ju bara att tejpa.

- Hur tror ni att den här väntan på något som egentligen är självklart påverkar eleverna?

Case 6

Detta är sista caset. Läraren informerar eleverna kring hur de ska göra dom utvändiga smygarna, med mjukskivan. Det här får de veta i baracken. När eleverna i hus 3 har kommit till huset, så gör dom ingenting. Dom sitter mest och väntar på nått, jag har ingen aning om vad. Läraren går mellan husen och informerar återigen eleverna, fast nu vid ett fönster. Läraren kommer till dom här eleverna klockan 10. Eleverna sitter eller ligger och pratar med varandra under den här informationen. Läraren är där i 3 minuter och går sedan vidare.

- Varför tror ni att eleverna inte gör nånting på en timme och när läraren kommer är eleverna inte intresserade?
- Vad tycker ni om att läraren är där i 3 minuter och instruerar och sen går han?
- Om läraren är där klockan 10 och är där i 3 minuter, vad tror ni att läraren gör istället?

Jag kan gå vidare. Nästa besök av läraren är 3 timmar senare och det närmar sig rast. Klockan är nu då kvart över 1. En elev undrar om dom gjort fel? Läraren svarar: det hoppas jag inte, jag litar på att ni gjort rätt. Eleverna sitter och pillar i huvudsak på telefonerna medan läraren kontrollerar. Läraren vill att de ska dela upp sig och ta varsitt fönster, för att det ska gå fortare. Då är läraren där i 6 minuter.

- Vad säger ni om det här?
- Läraren kom 3 timmar senare, från första besöket.
- Hur tror ni att det påverkar eleverna att han kommer så pass långt senare och att det nu närmar sig rast?

Eleverna tar en timmes rast och är åter tillbaka 14.30. Läraren uppmanar då eleverna att städa. Eleverna verkar inte bry sig. Läraren undrar om det är för svår uppgift eftersom det går så långsamt. Eleverna menar att de får för lite lärarhjälp. Läraren tycker att dom är lat eftersom de vet vad de ska göra och att de kan ju alltid söka upp han. En elev menar att: vi får ju ingen lön. Läraren går. Läraren har varit där i 6 minuter.

- Vad tänker ni om det här?
- Tror du att det var för svår uppgift?

Totalt under den här dagen var läraren med dom här eleverna i 15 minuter. 3 minuter klockan 10, 6 minuter kvart över 1 och 6 minuter halv 3.

- Hur mycket tycker ni att en lärare ska vara med eleverna?
- Vad skulle ni säga är de faktorer som påverkar motivation, om vi nu pratar om det här bygget?

Appendix 4: Interview guide, study 2

Intervjufrågor till lärlingar

1. Hur mycket tid har du gjort eller hur mycket tid har du kvar. Vet du det?
2. Har du haft anställning sen du gick ut skolan?
3. Vet du ungefär hur stort företaget är? (cirka antal anställda)
4. Kan du med ord beskriva hur det gick till när du fick den här anställningen?
5. Vad anser du att man behöver kunna för nånting för att jobba som byggare?
Är det något speciellt man behöver kunna?

(förtydligande av fråga 5) Om vi tar kompetenser, vad behöver man ha för kompetenser för att jobba som byggare? Vad krävs av dig för att du ska kunna jobba här? Vad känner du att det krävs av dig i ditt dagliga arbete?

6. Om du skulle säga några specifika kompetenser, vad kan du?
7. Dom här kompetenserna som du nämnt, vart har du lärt dig dom?
8. Är det några kompetenser som du saknar men som du skulle vilja ha?

(förtydligande av fråga 8) Nu får du beskriva en grej som du skulle vilja lära dig som du inte kan idag.

9. Hur tror du att du ska kunna utveckla sådan kunskap?
10. Om vi tar det här med din gymnasieutbildning som du gått, känns den relevant mot dom förväntningar som fanns i arbetslivet, när du började din anställning?
11. Fanns det någon form av lucka? Skulle du kunna beskriva vad den luckan består av?
12. Finns det saker i skolan som du lärt dig men som du inte anser vara nödvändiga i arbetslivet?
13. På vilket vis tror du att din byggutbildning har påverkat dina möjligheter att jobba som byggare?

14. Ser du någon skillnad i att lära sig yrkeskompetenser i skolan eller på företaget, du är ju anställd?

15. Vilka förväntningar har du på det här företaget, gällande att utveckla nya yrkeskompetenser?

16. Vet du vilka yrkeskompetenser du ska lära dig under din lärlingstid?

17. Och då kommer vi in på det här, vad använder du eller företaget för att se din utveckling? Dokumenteras det på något sätt?

18. Om vi tittar på vad du gör nu, vad jobbar du med för tillfället och kan du beskriva den uppgiften?

19. Vet varför du gör just den här uppgiften och inte någon annan uppgift?

20. Vad är det som påverkar vilka uppgifter du gör, om vi nu tar exempel att det finns flera uppgifter att göra. Vad är det som avgör vilken uppgift som du får göra?

Extrafråga: Finns det uppgifter som du inte får göra och varför i så fall får du inte göra uppgiften?

21. Om du tänker tillbaka till när du började med uppgiften, kan du beskriva hur du kom igång med den? Hur gick processen till från att du fick uppgiften till att du började?

22. Kan du påverka hur en uppgift ska genomföras och i så fall på vilket vis då?

23. Visste du vad resultatet skulle vara av den här uppgiften?

24. Vilka möjligheter har du att påverka uppgiften så att slutresultatet blir annorlunda? Om du skulle stöta på uppenbara fel till exempel?

25. På vilket vis kan du avgöra om en uppgift är rätt utförd?

26. Vilka möjlighet har du att själv bestämma över uppgiften, dom uppgifter du vill göra och då metoder och dom slutresultat som då blir?

Utförandet då? Hur stor möjlighet har du att bestämma över det?

Vad skulle hända om du ansåg att det var ett bra resultat men någon annan ansåg att det var ett dåligt resultat? Har det hänt?

27. Kan du ge ett eller något exempel där du anser att du lärde dig något nytt?

Skulle du kunna sätta ord på nått av det där du känner att du lär dig?

28. Kan du ge något exempel när du anser att du inte lärde dig nånting? Vi kan prata onödigt, onödiga uppgifter till exempel.

29. Skulle du kunna beskriva en bra lärmiljö eller uppgift för att lära sig nånting? (för att bli snickare)

Vad skulle hända om uppgiften var för svår?

30. Kan du ge exempel på en dålig lärmiljö eller en dålig uppgift för att lära sig nånting? Vad kännetecknar en sådan?

31. Om du får tänka helt fritt, vilka mål har du med den här lärlingstiden?

32. Skulle du vilja tillägga nånting som vi inte har pratat om nu, om vi tänker: du jobbar som lärling, du är formellt sett under utbildning fortfarande. Är det något du skulle vilja säga till mig att ta med mig kring hur är det att vara lärling?

Visste du vad dom hade för förväntningar?

Var det någon fråga som kändes svår eller konstig av det jag har ställt nu?

Då tackar jag för att du har varit med på den här intervjun.

Appendix 5: Consent letter

Hej!

Mitt namn är Magnus Fjellström. Jag är antagen till lic.-forskarskolan i yrkesämnenas didaktik och kommer därmed att skriva en avhandling kring vad som går att lära via den projektförlagda utbildningen som du är delaktig i. Därför kommer en studie att genomföras där syftet är att identifiera vilka kunskaper en projektförlagd utbildning kan generera. Jag har därför för avsikt att genomföra observationer och intervjuer under läsåret (xx). Fokus för studien handlar om vilka moment ni som grupp genomför och inte specifikt vad du som individ gör. Observationer kommer att antecknas och intervjuer med elever kommer att spelas in. Materialet från observationerna och intervjuerna kommer att behandlas konfidentiellt där din medverkan inte kommer att gå att identifiera. Resultatet av denna studie kommer att bidra till en ökad förståelse för hur projektförlagd utbildning påverkar vad du kan lära dig av att du undervisas utifrån projektförlagd utbildning. Ditt deltagande är frivilligt men din medverkan är viktig för studien.

Jag är införstådd i vad det innebär att delta i denna studie och är medveten om att jag när som helst kan avbryta min medverkan.

Namnunderskrift _____

Ort/datum _____

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