



Vocational students' identity formation in relation to vocations in the Swedish industrial sector

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Abstract

This article investigates vocational identity formation among students studying vocational education programmes that focus on vocations within Sweden's industrial sector. The empirical material is based on twenty-eight qualitative interviews with students enrolled on industrial programmes at four upper secondary schools. Taking a situated learning perspective as our starting point, the study reveals how the students' vocational identity formation can be understood by examining their learning trajectories, which are shaped by their social backgrounds, their perceptions of workplace-based learning and industrial vocations, and their thoughts about their vocational futures. The findings demonstrate that students' vocational identity formation is not a single linear process. On the contrary, three learning trajectories emerged which correspond to three different student groups. The students oriented towards commitment intended to work in industrial vocations, while the students oriented towards flexibility were open to the possibility of careers outside the industrial sector, and the students oriented towards ambivalence had no obvious plans for their vocational futures. In conclusion, this article suggests that in order to better understand the formation of vocational identities, the notions of learning trajectory types and social categorisations need to be considered in greater depth and understood in relation to the upper secondary school environment.

Keywords: vocational education, industrial programme, vocational identity, trajectories, social categorisation



Introduction

Students who are enrolled on vocational education programmes often prefer workplace-based learning to classroom learning, taking a fast-track route to the labour market (Beck, Winum & Bøje, 2014). In order to support smooth transitions between school and work, recent policies and reforms enacted in Sweden have given a higher priority to workplace-based learning in vocational education in order to bridge the gap between school and working life. Such pathways can be examined as part of a broader process of identity formation (Wenger, 2010), including the shift from a student identity to a vocational identity. In this article, a vocational identity is defined as a determination to commit to the values of a vocation (Armishaw, 2007), while understanding and articulating the reasons for wanting to take up the vocation (Evans, Guile, Harris & Allan, 2010).

Research into vocational students' identity formation is still scarce, and the students' perceptions of their own vocational identity formation have not been fully investigated (Virtanen, Tynjälä & Stenström, 2008). Nor has attention been paid to their experiences of what prepares them for an uncertain vocational future (Kilbrink, Bjurulf, Baartman & de Bruijn, 2018). Billett (2014) argues that there is a tendency to disregard students' perspectives of their vocational identity formation, and that their voices should be taken into consideration to a greater extent. From a student perspective, our ambition is that this article should contribute knowledge about students' vocational identity formation. An empirical example is used, based on interviews with 28 students enrolled on the industrial vocational education programme at four Swedish upper secondary schools. More specifically, the aim is to investigate vocational students' perceptions of their identity formation in relation to a vocation within the industrial sector. The industrial sector is of particular interest because previous research has paid little attention to industrial programme students at Swedish upper secondary schools in connection with teaching and learning within the programme (Berner, 2010). An exploration of students' learning trajectories in industrial vocational education is timely, given that the Swedish industrial sector has a shortage of skilled labour and applicants for the industrial programme are too few in number and often have low grades (Gustavsson & Persson Thunqvist, 2018). Similar tendencies have been observed in industrial sectors and vocational programmes across the Nordic countries (Jørgensen, Olsen & Persson Thunqvist, 2018).

The article is structured as follows. In the next section, there is a focus on the current debate regarding identity formation, and three different lines of argument are presented. The subsequent section introduces a theoretical framework informed by a situated learning perspective (Lave & Wenger, 1991; Wenger, 2010). The theoretical argumentation here is that vocational identity formation is closely interlinked with students' learning trajectories, which are shaped by different conditions. Later, the research setting and methodology are described.

Then follows a presentation of the findings in connection with the students' vocational identity formation, which is not a single linear learning trajectory. Instead, three different learning trajectories emerged, corresponding to three distinct groups of students. The differences between these groups can be traced back to the students' social backgrounds, their perceptions of workplace-based learning and industrial vocations, and their thoughts about their vocational futures. Finally, the findings are discussed and summarised in a few conclusions, with practical implications for the vocational education system.

Vocational identity formation in changing times

In research into identity formation within the field of education and work, at least three different lines of argument can be identified in connection with the significance (or insignificance) of identity formation for young people and students during the initial phase of their vocational development and their commitment to a specific vocation or vocational field. The first such line of argument suggests that vocational identity is irrelevant in today's flexible working life, as individuals' futures are influenced by a discourse of individualisation and flexibility (Beck, 1992; Giddens, 1990; Sennett, 1998). In a policy context, this line of reasoning is driven by the idea that more people with general academic skills are required to meet the demands of a post-industrial knowledge society and to create a flexible labour market. Neo-liberal trends within education policies also emphasise that students have a personal responsibility to make themselves employable (Michelsen & Stenström, 2018). The question of the relevance of vocational identities in initial vocational education is also part of the general picture within research into the increasingly prolonged and complex transitions between school and work (Jørgensen, 2013; Walter, 2006.) This is due in part to the changed conditions in terms of socialisation and identity formation in the 'late modernity' (Bauman, 2000; Giddens, 1990). In a society that features flexibility and high levels of mobility, the solidity of a vocational identity is undermined by the ideals of lifelong learning (Nielsen & Pedersen, 2011). Consequently, young people's changing approaches to work and careers mean that general competencies are valued above specific vocational skills and orientations (Walter, 2006).

The second line of argument, which stems from research into the development of vocational identities in different working practices, suggests that strong vocational identities continue to develop even during unstable periods of work (Doherty, 2009; Ulfsdotter Eriksson & Linde, 2014). In particular, this is seen in sectors where there is a strong traditional identification with vocations that are tied to specific workplaces and work tasks (Doherty, 2009; Kirpal, 2004). 'What do you do for a living?' is a common question when meeting other people for the first time, since skilled work and identity still seem to be closely linked (Ulfsdotter Eriksson & Linde, 2014). However, long-term commitment to work

can sometimes imply an acceptance of a job simply because of the security it offers (Kirpal, 2004).

The third line of argument is rooted in the field of vocational education. The argument here is that vocational students' identification with a specific vocation is highly heterogeneous (Reegård, 2015), and students' vocational identity formation features significant diversity (Jørgensen, 2013). This diversity is partly due to differences in the institutional arrangement of vocational education, which affects students' attitudes towards work. In a Nordic context, research also reveals how vocational students' attitudes towards work differ between individual labour market sectors. Vocational upper secondary education in Norway aimed at 'weak-form occupations' (Reegård, 2015) within the service sector largely promotes flexible strategies for dealing with uncertainties in working life. However, whereas some vocational students are motivated by a desire to keep on moving, lacking an orientation in their work, others are highly ambitious and are committed to a career within a specific field (Reegård, 2015). Nevertheless, the conditions for identity formation in the service sector are quite different to those within vocational education that targets technical and industrial vocations (Jørgensen, 2013). Even so, research into students' vocational learning in connection with becoming a skilled worker suggests that the students studying technical and industrial programmes have a wide range of different motivations and future orientations (Fjellström, 2017; Jørgensen, Olsen & Persson Thunqvist, 2018). Billett (2011, p. 238) emphasises the need to give students a voice, in order to see the variations among students and to capture 'students' interests, readiness and bases by which they participate in and learn through vocational education'.

Vocational identity formation – a theoretical approach

The vocational students included in this study are at the beginning of their vocational learning, and are therefore in an initial transition phase of forming a vocational identity within the industrial programme, in which they alternate between the school and the workplace, or – in Wenger's (1998) words – between two communities of practice. The industrial programme also represents a wider institutional setting: it is part of the upper secondary school system and is oriented towards vocations in the industrial sector. The vocational identities thus derive from schools and workplace-based learning. Therefore, students' vocational identity formation is here understood as 'an initial or novice phase in their future vocational identity as employees' (Virtanen et al., 2008, p. 1).

On a more conceptual level, vocational identity and identity formation are closely linked to the notion of a learning trajectory (Wenger, 2010). A learning trajectory ties together the students' background, their present situation and their vision of a future vocation. It implies that the past, the present and the future shape vocational identity through participation in a community of practice,

which is defined by its common activities and engagement, and is where students develop a vocational identity by interacting with more experienced workers (Lave & Wenger, 1991; Wenger, 2010).

A learning trajectory should not be understood as a fixed timeline, but rather as a process of constant movement towards a vocation (Wenger, 2010). Pointing to the diverse types of learning trajectories, Wenger (2010) distinguishes between different trajectories that relate to different forms of movement to and from a community of practice. An inbound trajectory refers to the learning that occurs when the learner's ambition is to become a full participant in a community of practice, although his or her present participation may be peripheral (Wenger, 2010). For various reasons, some learning trajectories never lead to full participation and instead remain peripheral. Nevertheless, the experiences achieved by a peripheral learning trajectory may still affect the individuals' vocational identity formation. The learning trajectories that lead away from one community of practice to another are known as outbound trajectories (Wenger, 2010). Although an outbound trajectory leads away from the current community of practice to another, it can still provide important relationships and vocational knowledge that affect future work. However, not only do newcomers follow the learning trajectories of experienced workers, they also have the potential to create new ways of participating in a community of practice (Wenger, 2010) by taking own initiative and ensuring that they are invited to participate in more advanced tasks (Akre, 2003).

Learning trajectories – and thus also vocational identity formation – are shaped by past and present experiences, and by future plans. When studying students' vocational identity formation, past experiences are an important condition as most young people's future vocational choices seem to hark back their social and family backgrounds (Ball, Macrae & Maguire, 1999). An important finding in Lehmann's (2005) study of young people in apprenticeship programmes was that socioeconomic status, such as their parents' educational background, and the family's attitudes towards theoretical knowledge and practical skills had a significant impact on the young people's career paths.

Several studies emphasise that the formation of a vocational identity can best be understood in the context of work (Jørgensen, 2013; Klotz, Billett & Winther, 2014; Tanggaard, 2007). However, Virtanen et al. (2008) argue that students' vocational identity formation can never be compared to employees' identity formation, because of the short periods students spend in the workplace. Nevertheless, students' workplace-based learning is seen as an important part of vocational education programmes and forming a vocational identity (Billett, 2011). During workplace-based learning, students learn about who they are in the work community and gain an awareness of their strengths and weaknesses (Virtanen et al., 2008). Much of students' learning is informal, and participating in daily work activities together with more experienced co-workers is therefore of

paramount importance if students are to learn the necessary skills for the vocation and form a vocational identity (Billett, 2011; Evans et al., 2010; Gustavsson & Persson-Thunqvist, 2018). Ferm, Persson-Thunqvist, Svensson and Gustavsson (2018) have noted that students take on a great deal of responsibility during workplace-based learning, by participating in work activities and positioning themselves as resources within the work community, and by adapting to the ideals of the workplace. By asking questions, seeking advice and searching for role models, students can advance their vocational identity formation (Ferm et al., 2018; Virtanen, Tynjälä & Collin, 2009). Students who reflect on workplace practices are more likely to develop a vocational identity of their own (Baartman, Kilbrink & de Bruijn, 2018; Chan, 2014). Vocational learning also includes the internalisation of vocational behaviours, attitudes and values directed towards a specific vocational identity and a sense of what is required in order to be considered: 'the right person for the job' (Colley, Diment & Tedder, 2003, p. 488).

Vocational education is often proposed as a good choice for students who struggle with more theoretical courses, and this perspective further lowers the status of vocational education (Billett, 2014). These issues may be linked to class and other social conditions as well as power and hierarchy beyond the community of practice. The theoretical perspective of situated learning has been criticised for paying too little attention to these aspects (Sawchuk, 2003) or for neglecting them (Hughes, Jewson & Unwin, 2007). The concept of categorisation as defined by Jenkins (2000) can further develop the framework of analysis by contributing towards an understanding of how vocational identity formation is expressed, through the social processes of labelling and reacting to the labelling of both oneself and others. The social categorisation of oneself and others helps individuals to define who they are and who they are not (Jenkins, 2000). Jenkins (2000) argues that a community's identity may be strengthened by the members' responses to other groups' categorisations of them. For example, the image of students in vocational education has, as Billett (2014) suggests, historically been held in low esteem by the societal elite, and this disparaging view of vocational education and its low status is still a prevalent view. Other aspects are also related to identification, such as the labelling of vocational education, participating in a work community, the development of competencies and the student's ability to work independently (Jørgensen, 2013).

The image of the future vocation can also affect students' vocational identity formation through their understanding of the particular vocation they aspire to and whether or not they see a future in it (Virtanen et al., 2008). Ball et al. (1999) found that young people have different views of the future. One group had a clear picture of the future as stable and positive, while another group viewed the future as unclear and uncertain. A third group had no image of their future at all, considering themselves to be simply 'getting by', and not active producers of their own future. Students' ability to imagine a future based on learned

vocational skills can be a sign that they have reached the final state of 'being' their vocation (Chan, 2013). To sum up, the students' identity formation can be analysed via the concept of learning trajectories which are shaped by the students' past experiences, their present experiences of workplace-based learning and industrial work, and their visions of the future.

Research setting

Initial vocational education in Sweden is an integral part of a state upper secondary school system that targets almost all 16- to 19-year-olds. There are eighteen three-year national programmes, twelve of which are vocationally oriented and comprise a combination of school-based education and workplace-based learning. The students who participated in the study were all enrolled on the industrial programme, one of twelve Swedish upper secondary vocational education programmes. The research was carried out at four different schools which all shared the same courses and learning goals, and led to the same vocational qualifications for vocations in the industrial sector. There are two different models for studying on the industrial programme. One is a school-based model, which must include at least fifteen weeks of workplace-based learning during the three-year programme. The other model takes the form of an apprenticeship, where at least half of the total education time is spent on workplace-based learning. The time spent on workplace-based learning takes very different forms in the two models, but in practice, each school has considerable autonomy to determine how much time students will spend on workplace-based learning. At the studied schools, the required 15 weeks were interpreted loosely, ranging between fewer than 15 weeks and up to one year. For this reason, we decided not to separate the two models in this study.

Regardless of the education model in which the students participate, they are always the responsibility of the school. The workplace-based learning is intended to provide a pedagogical environment for the students, as it simultaneously constitutes an authentic production environment. The aim of the workplace-based learning is to prepare students for their future vocational identity by giving them access to a workplace community. Schools and workplaces can interact in different ways, for example through individual or tripartite meetings, and through teachers visiting the workplaces (Köpsén & Andersson, 2018).

Method

The empirical material consists of qualitative interviews with 28 vocational students (22 male and six female) aged 18 to 20, all of whom were enrolled on the industrial programme. Nine of the students were in the second year of the programme, with the remaining 19 being in the third and final year. The selected

students all had experience of workplace-based learning at different sized manufacturing companies or in process industries. The four schools were selected strategically. Those responsible for the industrial programme at each school were contacted by e-mail with a written description of the research project. If a positive response was received, information about the study was sent to the students who signed up on a voluntary basis. The students were reassured that they had the right to withdraw their participation at any time, without having to give a reason. The project was approved by the regional ethics board in Linköping (ref. 2014/438-31).

Three of the researchers conducted the interviews, which took place at the schools and lasted approximately 60 minutes each. The interview guide included the following overall themes: past (e.g. social background and reasons for choosing the industrial programme), present situation (e.g. workplace-based learning) and vocational future (e.g. plans for after graduation). The intention was that these themes would reveal more about the process of identity formation over time. The interviews were recorded and transcribed verbatim.

Data analysis

First, the interview transcripts were carefully and repeatedly read to ensure familiarisation with the empirical material (Braun & Clarke, 2006). The next stage involved examining each interview individually to analyse the students' vocational identity formation. The concept of a learning trajectory (Lave & Wenger, 1991; Wenger, 2010) was used as a theoretical lens through which to study each student's experiences concerning the past (background), their present situation (with a focus on workplace-based learning), and their plans for future work. The concept of social categorisation – as developed by Jenkins (2000) – was also used to gain a deeper understanding of how the students labelled themselves and others in response to the status of the industrial programme and vocations within the industrial sector. After analysing each learning trajectory, the students' trajectories were compared to identify similarities and differences. Three main learning trajectories emerged from this analysis, representing collective patterns in students' orientations towards their future vocations which capture important aspects of vocational identity formation. The students' orientations towards future vocations were analysed in relation to other characteristics in terms of their backgrounds, their current experiences of workplace-based learning and their perceptions of their vocations, as well as their thoughts and ideas about the future.

Findings

The findings reveal three different learning trajectory types: students oriented towards commitment, students oriented towards flexibility and students

oriented towards ambivalence. Each learning trajectory is connected to vocational identity formations and vocational fields within the industrial sector.

The students oriented towards commitment

The students oriented towards commitment communicated a vision of their future as long-term employees within the industrial sector. They were committed to devoting themselves to a vocation and a career in the context of industrial work.

The previous industrial experiences of students oriented towards commitment were connected to male family members who had worked in the industrial sector, or to their desire to carry out manual work rather than sitting in a classroom. Their main reason for choosing the industrial programme was the practical nature of the work. They appreciated the contrast between practical work and classroom studies, which – in their words – simply involved ‘sitting at a desk, writing all day’. The richness of employment opportunities following the programme was also an important explanation for the students oriented towards commitment having chosen vocational education aimed at working in the industrial sector.

The students oriented towards commitment perceived workplace-based learning as an important gateway that could lead to a job in the industrial sector which they regarded as being highly advanced and challenging, requiring both technical and social skills.

It's a bit like studying Chinese and Japanese at the same time. Which word belongs to which language? It's kind of like that. What material wasn't I allowed to do what with?

The vocational identity of students oriented towards commitment was gradually formed at different workplaces through gaining knowledge about what it was like to work in the industry. Mastering industrial work was seen as highly skilled and time-consuming. The students oriented towards commitment generally said that becoming a skilled industrial worker involved a lot of time spent learning, which implies inbound learning trajectories towards a vocational identity as an industrial worker in the community of practice (Wenger, 2010). The students' commitment was expressed through their loyalty towards – and engagement in – their prospective vocation, but this loyalty was displayed in different ways. Some of the students oriented towards commitment openly showed an active interest in the vocation, while others focused more on working to secure their future employment in industrial work. In general, the students oriented towards commitment enjoyed their future vocation, and some even expressed a passion for industrial work, as shown in the quotations below:

It kind of fascinates me, that you can melt things together with today's technology. It feels really special.

S (Student): The first time I did it (welded), I fell in love.

R (Researcher): What is it about welding that's so special and made you fall in love?

S: Well, it's so much... the chemical processes, the technology, seeing how it happens, how the material melts... seeing the results. Seeing how I improve and develop... Welding is so tremendously, well it's such a big part of society, you don't realise that. I remember after that semester, the second semester in first grade, I kind of walked around the city looking for welding jobs to inspect.

As shown in the quotation above, mastering manufacturing processes could be seen as fascinating and something that students could be passionate about. Even though the students oriented towards commitment regarded themselves as skilled workers within a demanding and interesting vocation, they underlined the low status of industrial work, and this was paradoxically intermingled with referring to industry as lucrative and important for society.

R: What about within society generally, what is the status of working in industry?

S: Well... we build a lot of balconies for houses in Sweden and Norway, so we play an important role... Anyway, lots of welders and industrial workers do a lot for society, that's my opinion, they build foundations for houses and everything. Then there are the construction workers, and we do all sorts of things, not only for houses. We make things for cars, for boats, and all kinds of things. There's a lot that we do for... society.

The students oriented towards commitment clearly identified with the vocation, and they often envisioned a career as in management or as experts in the field, rather than working on the shop floor. Some students even planned to work abroad as specialist welders, such as underwater welders or welders at nuclear plants.

It's when you become a licensed welder and work abroad, where they require the skilled stuff, like at nuclear plants and so on, that's the goal, that's where I want to be and that's why I chose this programme.

The students oriented towards commitment had an explicit self-image of their identity as industrial workers, and hence their learning trajectories seemed to lead to a future as long-term employees within the industrial sector.

The students oriented towards flexibility

The students oriented towards flexibility communicated being open to careers outside the industrial sector. They would work for a few years within the industrial sector, and then change career paths later on. Unlike the students oriented towards commitment, they expressed their intention to leave the industrial business for another vocation. The perceptions of the students oriented towards flexibility in relation to industrial work were linked to their family working in the industry.

Well, I've virtually been raised in a workshop, dad has one at home and... he has three cars that he tinkers with all the time... And I've always enjoyed working with my hands rather than theory.

The reasons the students oriented towards flexibility gave for choosing the industrial programme varied. Some emphasised the good work opportunities, while others described it as a safe alternative. Others suggested that it represented a brand new world or a 'plan B' if they failed to achieve their primary goal. Some of the students oriented towards flexibility said that they had begun studying another programme and then changed to the industrial programme.

Moving on to their present perceptions of workplace-based learning, the students oriented towards flexibility – much like the students oriented towards commitment – spoke about the complex aspects of work. The words they used to describe the nature of their vocation included open, wide, challenging and responsible, constantly offering opportunities to learn new things. The students oriented towards flexibility also underlined the low status of industrial work at school, and categorised the students on preparatory programmes for higher education as snobbish people who belittled manual work. The students' focus on status between their own and other student groups can be interpreted as a sign of their identification as students rather than workers, thus implying a more temporal identity than that shown by the students oriented towards commitment. The quotation below illustrates this common way of talking about *us* and *them*:

Well, they're the fancy people; they want everything to be all neat and everything. We're like this: We can go to the canteen with dirty hands and everything – we don't care.

The students oriented towards flexibility felt that the students enrolled on preparatory programmes for higher education looked down on them. This categorisation also included discussions where vocational students positioned themselves and their territory in opposition to other groups of students, and referred to segregated places at their schools. For example, it was said that their own classmates on the industrial programme were free to be who they wanted, while students on preparatory programmes for higher education had to behave and dress in a certain way.

S: If you look at the other school building, it's a bit fancy or whatever.

R: Is that where the theoretical programmes are?

S: Yes, the technology programme, natural science, and the health and social care programme and all that. It's the people with shirts and slicked-back hair and so on. And here (in the school building with vocational programmes), everybody is the way they want to be. Nobody tells you that you can't wear certain clothes; you can wear whatever you like. And that's nice, because... everybody gets to be the way they want to be. I think that's pretty good.

A common categorisation among the students oriented towards flexibility was that they came from 'the bad side' of the school, while the students on

preparatory programmes for higher education represented 'the good side'. The students oriented towards flexibility described this division and the status hierarchy between theoretical and vocational students in great detail.

R: How would you describe the status (of the industrial programme)?

S: (Laughter) That we – well, we're at the bottom.

R: Do you think so?

S: Yes, I do, I believe a lot of people see it that way... they think they're better than us. Because they don't need to... we do the work, we do the dirty work or whatever, on this side (the vocational 'side' of the school).

This way of categorising other groups while simultaneously reacting to their categorisations of themselves suggests identification with work (Jenkins, 2000), while prestigious higher education preparatory programmes are labelled as an unwise choice for the future. When asked to reflect on their future after graduation, the students oriented towards flexibility often talked about starting off with a period of employment within the industrial sector before changing careers completely later on. This suggests a temporary identification with industrial work, thus implying a peripheral trajectory (Wenger, 2010). The students oriented towards flexibility often hoped to become police officers or firefighters, after first spending a few years working in industry. Some mentioned plans for a future within psychology or as games producers. The students oriented towards flexibility generally expressed a fairly positive view of industrial work and saw their future as flexible. They did not feel that they were stuck within a sector, but rather that they had many opportunities after the industrial programme. Even though the students oriented towards flexibility envisioned themselves changing careers later in life, they were open to an identity as an industrial worker.

The students oriented towards ambivalence

The students oriented towards ambivalence did not generally express a clear picture of their future, even though they mentioned industrial work as a possibility for themselves, at least in the short term.

Regarding their background and past experiences, some had no previous understanding of industrial work while others had family members in the business and had welding machines in their garages at home. The reasons given by the students oriented towards ambivalence for choosing the industrial programme ranged from being the obvious choice to offering access to a completely unknown field. They spoke of the practical nature of the work and the good employment chances as being important reasons for attending the programme. However, in contrast to the students oriented towards commitment, the choice of a vocational education programme was more often discussed as a 'coincidence' or an 'accident', not as an informed decision. For example, the educational choice during

the application process was even described as random: 'I just chose something at random, pressed a button.'

When it comes to their present perceptions of workplace-based learning, the discussions of the students oriented towards ambivalence revealed an ambivalent view towards industrial work. The students' prospective vocations were discussed in different ways. On the one hand, the prospective vocation was discussed as being intellectually demanding, as an industrial worker needs to be thorough and keep track of extensive knowledge. The students said that there are always new things to learn, and it is hard to fully master the vocation. On the other hand, positive views were contrasted with negative experiences, for example that the students' training was carried out in dirty workshops that only required practical know-how. A lack of engagement was also expressed, as the students did not seem to reflect on different aspects of the vocation, such as its status. The students oriented towards ambivalence often said that they had 'no clue' or 'hadn't thought about it'. Together, the students expressed an ambivalent view of their own personal connections to the industrial vocations they were currently being prepared for within their programmes.

R: Do you think of yourself as a welder?

S: Well, I don't think so. I don't know, I don't think too much about things like that, I go to school and I work, I take it one week at a time, I don't think much about the future.

The students oriented towards ambivalence generally communicated an ambiguous and sometimes contradictory personal view of industrial work, shifting between positive and negative descriptions of the vocation. One student had the following to say about industrial work:

It [industrial work] was so foreign, but interesting somehow. Because it's the foundation of society really; industry... Well, it's... it's so broad, it requires a broad knowledge base. I mean, you learn things all the time.

According to the quotation above, this student appears to have a positive view of industrial work. However, when questioned about a potential future within the business, the student says the following:

It almost feels like being raped, well it's a bit like that. It's a dirty job, I'm supposed to stand here and work hard all my life, damage my body and breathe in dangerous chemicals... And in that way I'm fascinated by people who've worked in industry all their life, that they've endured it, and worked there in some government service for a golden watch worth 8,000 (Swedish kronor), that's what a human life is worth today...

These types of descriptions, highlighting both negative and positive views of work, characterise some of the students oriented towards ambivalence' insecurities. When talking about the future, the students oriented towards ambivalence did not appear to plan very much. They were usually uncertain about what they

would work with and assumed they would eventually change careers from industrial work to various other sectors (e.g. childcare, restaurants, law and economics). Even though most students oriented towards ambivalence expressed both negative and positive views of industrial work, some saw it as a nightmare, as something they would never want to dedicate their future to. They clearly rejected an identity as an industrial worker, which implies outbound learning trajectories (Wenger, 2010) leading away from an identity formation within these types of vocations. However, even the most reluctant of the students said that they might possibly work for a short time within industry and then change careers later on. They did not seem to plan for or try to take control of the future, instead taking things one day at a time and adopting a 'wait and see' approach. Overall, the students oriented towards ambivalence communicated their uncertainty about work and the future, a lack of plans and an ambivalent view of industrial work.

Discussion

In this article, we have focused on vocational students' perceptions of their identity formation in relation to a vocation in the industrial sector. The findings reveal the multifaceted nature of identity formation in initial vocational education, where young adults are currently developing their future identities. Aspects of identity formation are found in the students' long-term engagement with a vocation, in their rejection of a proposed vocational identity, or in adopting a flexible attitude towards a prospective vocation.

Such diversity in students' future orientations may to some extent reflect increasingly individualised school-to-work transitions (Giddens, 2000; Walter, 2006). The ambition here, however, has not been to label students' identity formation from the outside but rather to contribute novel knowledge about their perceptions of what prepares them for an unknown vocational future (Kilbrink et al., 2018). By using the analytical concept of learning trajectories (Lave & Wenger, 1991; Wenger, 2010), three different learning trajectories were identified in relation to the communities of practice in the industrial programme. Each of these trajectories represented common characteristics in terms of social background, experiences of workplace-based learning and perceptions of the vocation, as well as thoughts and ideas about the future. The students' learning trajectories were formed by their early experiences of industrial work, for example male family members' familiarity with industrial work. This social background was an important reason for choosing the industrial programme, but not necessarily for committing to industrial vocations during the three-year educational programme.

A common theme was the status of vocational education relative to higher education preparatory programmes. This included social categorisations of *us* and

them and the border work that this involves. The notion of categorisation work (Jenkins, 2000) directed our attention to how students' vocational identities are also situated and articulated through differences, by defining what they are and are not in relation to others in the surrounding educational context. Interestingly, the interviews feature many examples of students defending the esteem of skilled industrial work while confronting the disparity of esteem between theoretical and vocational study programmes.

The students oriented towards commitment can be seen as having inbound trajectories (Wenger, 2010), which lead towards further and deeper involvement in industrial work. They identify with their prospective vocation and share an interest in the work and a vision of themselves as long-term employees (or employers) within industry. This also included mastering specialist vocations, for example underwater welders and welders at nuclear plants. The students oriented towards commitment long-term ambitions do not involve working on the factory floor; in other words, having an inbound trajectory leading towards a future as a 'regular' employee in an industrial workshop. Rather, their goal is to be promoted to management or expert positions, or to work abroad (see also Reegård, 2015). The students oriented towards commitment reflect on the low status of industrial work and focus more on the status of industrial vocations than on the status of the industrial programme. This may be an indication of their long-term identification as manifested in their inbound trajectories, which are directed more towards their future identity as industrial workers than their current identity as industrial students. The students oriented towards commitment identified strongly with the vocation and had a clear image of their future (see also Ball et al., 1999). With the students oriented towards commitment, their prospective vocation clearly represented a desirable identity.

The students oriented towards flexibility were characterised by peripheral trajectories (Wenger, 2010) that lead to short-term involvement in industrial vocations, without committing fully to a future in the industry. The students oriented towards flexibility generally put more effort into describing and addressing the discrepancy in status between theoretical and practical education rather than vocations. This can be interpreted as an indication of their temporary identification with industrial work, relating more to their present identities as industrial students than to their future identities as industrial workers. The students oriented towards flexibility often describe themselves as doing important and 'real' work, in contrast to the students on preparatory programmes for higher education, whom they categorise as snobs who are not as relaxed and genuine as the vocational students. This can be a strengthening form of identification, where categorising other groups as reacting against their categorisation of their own group can provide a sense of unity and shared identity (Jenkins, 2000).

The learning trajectories of the students oriented towards ambivalence were outbound, leading away from a vocational identity as an industrial worker.

These students' statements about not completely dismissing industrial work may be interpreted as a sign of their ambivalence and as a strategy to avoid the risk of being unemployed (Kirpal, 2004). These students generally lacked engagement with industrial work, viewing it mostly as a temporary vocation (Reegård, 2015). They did not mention the low status of industrial education and vocations to the same extent as the other students.

When comparing the learning trajectories and how they evolve over time, it is worth elaborating on the experiences that made a difference in the students' ways of thinking about their future vocational identities. All three groups could be described as fairly homogeneous in terms of social class and gender. Sociologically, it is widely assumed that family background and habitus greatly influence the life choices of young people and their 'imagined futures' (e.g. Ball et al., 1999). However, from a situated learning perspective, it is also interesting to focus on how students use common biographical experiences to access workplace-based learning and how new learning experiences contribute to the transformation of learning trajectories and the formation of vocational identities. Many students spoke about their early familiarisation with the vocation through family and friends. They also brought with them their previous knowledge and familiarisation with industrial work when entering vocational education and the workplace. This is not just a question of concrete vocational experience learned from family members; it is also a part of learning how to talk, look and behave like an industrial worker (Colley et al., 2003). This pre-conceptualisation (e.g., knowledge of unwritten rules) provides the students with important experiences in their learning trajectories (Chan, 2014) and community membership (Wenger, 2010). In addition, the students also shared considerable experience from previous school-based vocational training that facilitated their access to workplace-based learning (Ferm et al., 2018). Together with this, prior familiarity with industrial work contributed to the process of categorisation and identification with industrial work.

Interestingly, most students discussed their present perceptions of work-based learning in a largely positive way, for example as being intellectually demanding and offering plenty of learning opportunities. However, the relationship between the students' personal engagement and commitment to becoming an industrial worker and their 'imagined futures' differs significantly between the three groups. Whereas the experiences of workplace-based learning led to greater convergence between personal engagement in vocational work and future vocational identity among the students oriented towards commitment, the opposite was true for the students oriented towards ambivalence; there was a divergence between their 'imagined futures' and their actual role as students on a vocational programme. A radical expression of this divergence or ambivalence was a rejection of the idea of making a life as an adult industrial worker.

The students oriented towards commitment and flexibility reflected on both status and their future in relation to industrial work. If a lack of reflection implies

a lack of identification, this could provide some insight into why the students oriented towards ambivalence, in contrast to the other two groups of students, did not reflect much on the vocation or their future. This supports the important role of reflection on work, which has been shown in earlier research to be a crucial part of identity formation (Baartman et al., 2018; Billett, 2011, 2018; Chan, 2014).

Conclusion and practical implications

The diversity observed in the comparisons between students' learning trajectories indicates that vocational identity formation is a dynamic – and to some extent contradictory – process characterised by a degree of ambivalence. As we have seen, students' educational and vocational choices can be negotiated, revised or rejected over the course of their learning trajectories. Their flexible orientations towards future vocations also seem to be a significant feature of identity formation in vocational education, and this is part of upper secondary education's aim to prepare students for specific vocations, future studies and life-long learning (Berner, 2010; Reegård, 2015; Walter, 2006). One surprising result is the significant role workplace-based learning played in the students' vocational identity formation, given that the majority of vocational education in Sweden is school-based. The value of workplace-based learning in terms of developing solid vocational identities has been well documented in dual apprenticeship systems of vocational education (Jørgensen, 2013; Klotz, Billett & Winther, 2014; Tanggaard, 2007), but is relatively under-researched in school-based vocational education (however, see Ferm et al., 2018; Gustavsson & Persson Thunqvist, 2018). In line with the findings from these strands of research, the students oriented towards commitment in the present study voiced a relatively clear and strong orientation towards becoming skilled industrial workers within a specialist vocation. This appears to contradict theocratisation, arguing that vocational identities lose ground in education and work fraught with uncertainties in the late modernity (Bauman, 2000; Giddens, 1990). The results of the study also underline the importance of considering the impact of social background and previous experience (e.g. familiarity with industrial vocations through parents and/or close relatives) in connection with participation in initial vocational education including workplace-based learning.

In conclusion, students' learning trajectories must be understood in relation to the upper secondary school environment. It has been suggested that in order to better understand the formation of vocational identities, the notion of social categorisations needs to be examined in greater depth (Jenkins, 2000). Many students describe experiencing a hierarchy at school, with a clear distinction between vocational programmes and preparatory programmes for higher education. This segregation between different types of education was partly articulated in students' reflections on the status of industrial vocations within the school

context. Hence, noticing and addressing status hierarchies and labelling between groups are also aspects of identity formation that could strengthen vocational identity.

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