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Academic drift of technical VET teacher education in Germany, Sweden, and other Nordic countries

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Abstract

The academisation of vocational education and training (VET) teacher pathways, often referred to as academic drift, is a relatively recent phenomenon in Europe, with significant implications for both teacher education and VET research. This article examines the historical development of VET teacher education in Germany and Sweden, using these countries as cases to explore how political decisions and academic models have influenced their education. The study highlights the resulting tensions between the demands of academic work and the practical competencies required of VET teachers. The emphasis is on the teachers in the technical VET domain, given the distinct developmental trajectories observed in disparate disciplines, such as commerce, agriculture, and others.

The research draws on document analysis, expert discussions, and workshops with VET teachers conducted during long-term research visits to Nordic countries, alongside findings from the Erasmus project 'VETteach.' After tracing the evolution of technical VET teacher education in Germany, the article explores the establishment of VET research as a discipline and its impact on teaching practices in the study programmes. It then shifts focus to Sweden, where the effects of academisation on VET research and teacher education are examined. A comparison with other Nordic countries provides additional context. The findings reveal that while academic drift has enhanced the theoretical underpinnings of VET, it has also created tensions between academic learning and vocational competencies, with significant implications for the future of VET teacher training and research in Europe.

Keywords: academisation, history, vocational teacher education, Germany, Sweden, Nordic countries

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Conceptual context of the comparison

Understanding historical developments is essential for comprehending current structures and explaining the variations between countries. Despite numerous similarities in societal values and developments, these do not necessarily lead to identical outcomes. This notion is clearly demonstrated by the extensive comparative study of the Nordic countries (Helms Jørgensen et al., 2018).

As is common in historical studies on VET (Gonon, 2020), this analysis does not rely on a specific theory of modernisation, unlike some German-speaking studies (Reinisch, 2011; Stratmann, 1993). The modernisation theories of Habermas and Van der Loo/Van Reijen, used in those studies, can be effective in explaining certain phenomena. For example, they illustrate differentiation, such as the diversification of VET teacher education content in Germany, rationalisation, such as the trend of 'academic drift' – the shift toward greater academic qualifications in VET – and individualisation, such as offering customised pathways for obtaining qualifications. However, applying a single theoretical framework can risk overlooking important phenomena that fall outside its scope (Kaiser, 2024). As a result, the findings of this study may appear eclectic in its explorative approach, but they aim to elucidate the institutionalisation of practices over the past century and to open a window for reformed perspectives by highlighting the strengths and weaknesses of these systems.

In analysing VET systems, various typological approaches can be applied, including examining the role of the state in steering VET (Busemeyer & Trampusch, 2012; Greinert, 2004), the role of occupations (Deißinger, 1998; Gonon & Bonoli, 2023), and the role of didactics (Pilz, 2016). However, these approaches often neglect the historical and cultural contexts, as well as the negotiation processes that have shaped these systems (Kaiser, 2020). Without a clear understanding of these contexts, it becomes difficult to discern the underlying reasons for observed differences. This is particularly relevant when the economic structures of different systems are strikingly similar (Hörner, 2004).

When comparing systems, it is crucial to ensure that the pathways to professions, such as becoming a technical VET teacher, are comparable. This can be done by using established frameworks to identify distinguishing characteristics. A clear understanding of the specific structures, requirements, and details is necessary. For example, if technical VET teachers are responsible for providing sector-specific opportunities for practical skill development and therefore also must have technical knowledge of the maintenance of machines and equipment, they are likely to require different qualifications than those who do not have this responsibility, because they are teaching the theoretical basics. Thus, VET teacher education often follows distinct paradigms, akin to the paradigms of educational systems and the level of abstraction required for

teaching. Grollmann and Rauner (2007) differentiate between the *trade paradigm*, which focuses on practical training in the tradition of the different trades, the *general teaching paradigm*, which emphasises broad educational foundations, related to academic teacher training, and the *technical paradigm*, which combines *theoretical knowledge with technical application*, more related to the training of engineers. These paradigms provide a framework for comparing VET teacher education in Sweden and Germany, as will be discussed later.

Educational systems are shaped by their political constitution, the economic conditions, societal values, and needs of each country, as well as by the resources available for investment in the educational system. These systems evolve in response to financial resources and the pursuit of particular interests. For instance, if the societal priority is to ensure equal opportunities and security for all, more or less regardless of financial contribution, a community school system and comprehensive social security will likely emerge. In contrast, meritocratic systems based on neoliberal principles focus on distributing opportunities according to performance, with family background, financial capital, and social capital significantly influencing the potential and social security of the next generation (Schmid, 2005). In the latter case, the task of the teachers is strongly focussed on imparting demanding knowledge and is far less oriented towards individual support than in the former case. As a result, the qualification focus of teacher training will also differ.

Given the interconnection between VET systems and the broader economic, cultural, and political contexts, as well as their close relationship with other educational systems, this study draws on an analysis of descriptions of system, historical sources, political decisions, and their implementation. These findings are reflected in scientific publications and national reports, but they are also informed by discussions with experts (teachers, school principals, policymakers), visits to vocational schools and further training institutions, and exchanges with researchers at numerous conferences and seminars in Scandinavian and German-speaking countries over the past decades. The findings were systematised according to the prescribed structure of a German-language handbook and revised several times before being published as the 2023 country study (Kaiser, 2023).

Moreover, collaboration in the EU-funded project VETteach with scientists in the field of VET teacher education provided valuable insights for comparing specific aspects, such as support for disadvantaged individuals, the integration of digital technologies, and the development of democratic competencies in VET teacher education through systematic international comparisons (Hoppe & Kaiser, 2021). It is important to note that the facts are limited to specific ways of VET systems and VET teacher education related to technical occupations and branches. For example, earlier study programmes for business and sales teachers

in Germany or VET in the field of forestry or household in the Nordic countries are not taken into account.

This study also incorporates findings from an early research project at the University of Darmstadt (Schapfel, 1994), which conducted a comprehensive review of the academisation of VET teacher education in Germany up until 1990. The next section of the article refers to this study, among others, and presents an illustration of the historical evolution of the academisation of VET teacher education in Germany.

History of VET teacher education in Germany and the current structures

The systematic training of technical teachers for vocational schools in Germany began in 1834 in Karlsruhe. Initially, the qualification was short and highly oriented toward teaching work and addressing the regional needs of the trades at the Polytechnic School, founded in 1825. This institution was the forerunner of today's Karlsruhe Institute of Technology (KIT) (Zimpelmann, 2019). The need for specialised schools arose from industrialisation and the growing challenges related to the development of technology in the workplace (Stratmann, 1999). It became increasingly difficult to visualise the complex production processes and, for example, to make corrections to workpieces by hand in the production process. As a result, it had to be possible to understand technical drawings and produce them in a simple form, even at skilled worker level. By the turn of the 20th century, systematic training structures for VET teachers had become established, varying between a stronger academic focus and independent vocational education institutions dominated by specific industries.

One early development was the 'State Seminar Course for Teachers of Technical Advanced Training Schools,' established in 1913 in Berlin. This programme trained craftspeople, skilled industrial workers, and primary school teachers as technical instructors within one year. In 1925, the duration of training was extended to two years, and the course was renamed the 'State Vocational Education Institute' (Rützel & Schapfel, 1994, p. 8). The pioneers of German vocational education theory Kerschensteiner, Litt, and Spranger, who resisted academic drift, feared that increasing the academic nature of vocational education would lead to an overly theoretical approach that disconnected vocational schools from the practical, hands-on training required in the workplace. They advocated for maintaining a balance between academic knowledge and vocational skills to ensure relevance to real-world job demands (Müllges, 1976).

During National Socialism, technical teacher training was standardised in 1942, with a course length of four semesters at vocational education institutions.

Following the Second World War, there was a shift in focus towards standardisation, with a greater emphasis on extended training programmes that were subject to federal state regulations (Mehnert, 2000). Pre-academic models were heavily oriented toward workplace practices, grounded in the Frankfurt Method and later experimental technical courses. The Frankfurt Method, developed to address workplace needs, focused on practical training that aligned with real-world work processes, whereas experimental technical courses explored innovative approaches to integrating technical skills into teaching methods. These models emphasised the development of educational missions tailored to the socioeconomic context, focusing on work processes (Brechmacher & Gerds, 1993).

In the 1960s, the demands from technical teacher associations for academic recognition and salary parity with commercial teachers and upper secondary-level teachers were finally met. Consequently, VET teacher education programmes were introduced with a state exam at general universities, followed by a second phase of 1 ½ years of internship at VET schools ending with the second state exam, similar to the teachers at baccalaureate school (Gymnasium). As VET teachers also taught at higher technical schools that awarded a university entrance qualification and also because of a shortage of well-trained VET teachers in almost all federal states at the time, the federal states agreed to these demands in the hope of making the profession more attractive and eliminating the shortage (Stratmann, 1994). Bauer (2007) provides an overview of the reasons behind this academic shift:

> To summarise, the ultimately successful implementation of the academic TVET teacher education is based on three motives: firstly, federal discussion about the modernisation of the education system and the expansion of the VET system based on the overall concept of scientific orientation of teaching and learning, with necessarily needs scientifically educated teachers. Secondly, the reduction of the shortage of VET teachers was due to a higher attractiveness of this profession, Thirdly, the interest of the TVET teachers association, who were primally aiming for professional advancement in terms of salary and thus equal footing to teachers of grammar schools. (Bauer, 2007, pp. 129–130)

In contrast to the developments in West Germany, the German Democratic Republic (GDR) introduced a nine-semester teacher training course in the 1950s, offered at universities in Dresden, Magdeburg, and Karl-Marx-Stadt (Chemnitz). This system involved a one-phase teacher training programme that integrated internships and concentrated on a single subject. In comparison to the two-phase training system in West Germany, which separated academic and practical elements, the GDR's one-phase model combined both components, potentially offering more immediate, integrated practical experience of teaching. After reunification, this model was transferred into the existing structures in West Germany (Thomas, 1992).

Both parts of Germany saw the academisation of VET teacher training, though this shift led to a strong alignment with engineering and natural sciences (Pätzold, 2011). This alignment moved the focus at most universities away from work-process orientation and teaching practice. Once established professorships for subject-orientated didactics in the technical faculties at the universities were replaced when they expired by professors from engineering fields, who operated by reducing engineering content into didactic elements without fully developing a work-process-oriented approach to teaching. This led to ongoing debates between proponents of work-process-oriented approaches and those favouring an engineering science focus. In 1998, this tension resulted in the founding of the Society for Technical Sciences and their Didactics (GTW), a part of the German Association of Work Sciences, which supported the work-process-oriented research, publications, and conferences (Hägele & Pangalos, 2012). This ongoing debate has practical implications for VET teacher education today, as the tension between focusing on engineering content versus work processes affects the balance of theory and practical training in curriculum development and the didactical design of learning. In the course of these debates, the importance of competencies for teaching and classroom management is sometimes overlooked (Brüchner et al., 2024).

In the current era, the Standing Conference of the Ministries of Education and Cultural Affairs (KMK) has established a national framework for all VET teacher study programmes at universities. While differences exist between the various Bachelor's, Master's, and state examination programmes, several similarities remain:

1. Admission requirements: Candidates must hold an Abitur qualification and complete at least 12 months of relevant work experience or an apprenticeship in the vocational subject area (work experience can be completed during the years of studying).
2. Study programme: The programme spans ten semesters and includes two subjects. The curriculum combines theoretical and practical elements in vocational pedagogy and didactics. Included are some weeks of internships in school, reflected on an academic level.
3. Practical training: An additional 18 to 24 months of practice in school is dedicated to a second stage of the programme, which includes supplementary seminars at state training institutions for teachers.

The structure of VET teacher education can be understood through three key stages: *input*, *process*, and *output*. As shown in Figure 1, the *input* includes the requirements for entering the programme, such as school-based or academic qualifications and work experience. The *process* refers to the components of the programme itself, including its duration, the provider (typically universities), the

content and methods used in teaching and learning, and the assessment tools employed. Finally, the *output* stage refers to job opportunities available for graduates, who primarily go on to teach in VET schools.

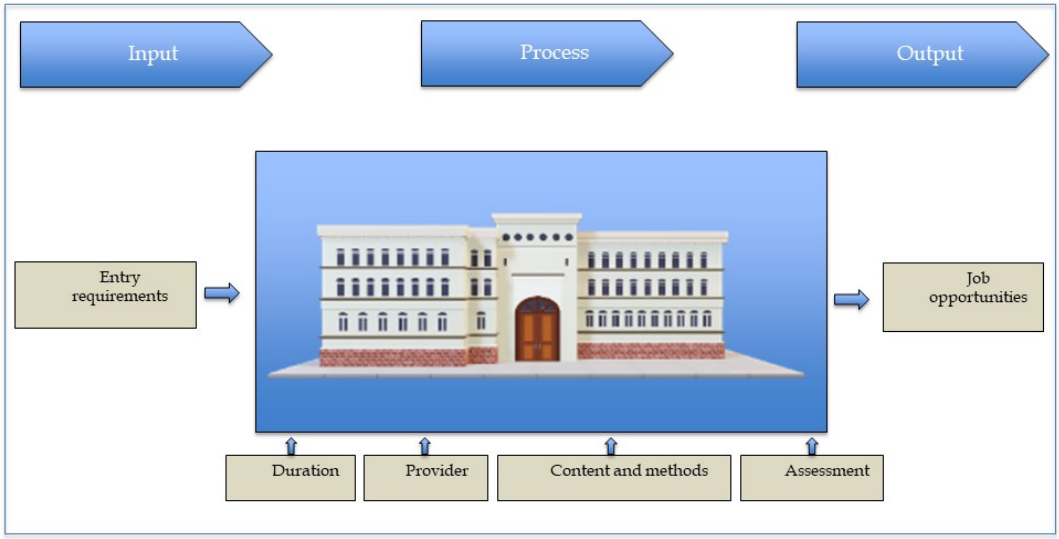

Figure 1. A conceptual model comparing VET teacher education in different countries (Hoppe & Kaiser, 2021, p. 167).

Table 1. Overview of VET teacher education and profession in Germany (based on Hoppe & Kaiser, 2021, p. 167).

Germany	
Entry requirements	University entrance certificate, 12 months practical experience or apprenticeship
Provider	Universities, sometimes supported until Bachelor level at Universities of applied science. Second Phase: State study seminar
Duration	Bachelor 3 years (180 ECTS) + Master 2 years (120 ECTS) or state exam 5 years (300 ECTS)
Content and methods	120 ECTS first subject, 90 ECTS second subject, 90 ECTS pedagogies and didactics Classical academic methods in the teaching subjects, project learning and critical reflective methods in educational science and practice
Assessment	Scientific term papers, Master Thesis, oral presentations at University level Teaching plans and teaching practice in the second phase
Job opportunities	VET school in the dual system, Technical or specified Gymnasium, adult education

To unfold these elements in the German context, Table 1 provides an overview of the key components of VET teacher education in Germany, including entry requirements, programme duration, content, methods, and job opportunities. This model will also serve as a reference point for comparison with Sweden, discussed below.

Academic education of VET teachers and the establishment of vocational education as a scientific discipline in Germany

The following section is dedicated to the effects of academisation with regard to the formation of a VET science. Influences from neighbouring disciplines, such as general pedagogy, industrial sociology, feminist sciences, psychology, and labour science, are not taken into further consideration. These influences also differed considerably depending on the period, the location of the universities, and the educational background of the academic staff.

In vocational disciplines, students predominantly study engineering sciences or specialised sciences, which often results in minimal connection to the occupations they will later teach and the associated work processes and activities. This disconnection can hinder the ability of VET teachers to address the practical needs of their students, as the academic training does not fully prepare them to offer real-world applications of technical skills. The foundation of the GTW (Society for Technical Sciences and Their Didactics) as part of the Association of Work Sciences in the 1980s, which reflects the dominance of the engineering paradigm in the German system, as categorised by Grollmann and Rauner (2007) was a reaction on this disconnection. However, as academic training for VET teachers was to be provided in almost all federal states, the number of students remained too low to establish specific professorships for didactics related to work and vocational fields at all locations. The orientation towards existing engineering degree programmes had to be maintained, especially since the requirements of the higher VET school forms, which do not prepare students for skilled work, also had to be taken into account. In addition, no solution had yet been developed for occupational fields that involve a certain breadth of professions, such as in the field of agriculture, which ranges from forestry and horticulture to fishing and animal husbandry (Kalisch & Kaiser, 2019).

Since 2000, there have been initial efforts to improve the regional structure of degree programmes, particularly in fields like nursing sciences and social work, by linking digital educational offerings and increasing cooperation with universities of applied sciences (Fahle et al., 2016). However, in such cases, transitions to universities for a master's degree must be guaranteed, as universities of applied sciences do not generally offer second subjects.

The establishment of vocational education research as an independent field of research is closely linked to the academisation of VET teacher education (Lipsmeier, 2010). This shift allowed the development of networks between professorships and the emergence of vocational pedagogy as a research field. These research efforts primarily focused on improving vocational curricula, developing teacher training methodologies, and the integrative effects of VET for socially disadvantaged groups of people at the beginning. For instance, the first appointments to economic pedagogic professorships occurred alongside the academisation of commercial teaching, and professorships in vocational education were similarly staffed as technical teaching became an academic profession (Zabeck, 1992).

In his study, Marschner (2018) traces the growth of VET research in Germany focusing on technical VET, noting that between 1930 and the late 1950s only six relevant professorships were appointed. However, this number increased significantly between 1960 and 1980, with 19 appointments made, 11 of which took place in the 1970s. The founding of the vocational, business, and economics education division (BWP) within the Deutsche Gesellschaft für Erziehungswissenschaft (German Association of Educational Science) in 1964 was also pivotal in establishing vocational education research in Germany. This period marked a renaissance in vocational education research, with contributions from various interdisciplinary fields, such as feminist research, adult education, labour market studies, and youth research. These interdisciplinary efforts were supported by state funding and research from both public and private research institutions, including the Bundesinstitut für Berufsbildung (Federal Institute for VET) and the Institut für Arbeitsmarkt- und Berufsforschung (Federal Institute for Employment Research) (IAB) in Nuremberg.

Today, vocational education research in Germany has become a well-established academic discipline, as evidenced by the existence of more than five specialised journals, each with distinct orientations and recognised peer-review processes. In addition to the specialised associations, the *International Journal for Research in Vocational Education and Training* (IJRVET), based in Bremen, further reinforces the field's academic standing. There are several scientific conferences with specific thematically focuses in the field of VET. These conferences and the discourse in the journals have been instrumental in shaping national VET policies, promoting collaboration between universities and vocational schools, and fostering the development of innovative teaching and research methodologies as well as the practice of VET in schools as in the companies.

The anthology published by Rauner (2018) on vocational education research demonstrates the diversity of the subject matter and methodologies used in the field. The anthology's 96 contributions reveal the breadth of vocational education research, encompassing curriculum development, vocational pedagogy, and

adult learning. In this context, VET science in Germany can now be described as an established science, as defined by Clark (1973), and as a direct consequence of the academic drift within VET teacher education (Götzl et al., 2019).

Although the BIBB (Federal Institute for Vocational Education Research) is responsible for private-sector VET policy, it also conducts research on structures, curriculum development, educational rules, adult education, and media across its five main departments (BIBB, 2010, p. 25). Federal and EU-funded pilot projects administrated by the BIBB have significantly stimulated research at universities, particularly in the field of VET. However, since the 1990s, university-based research has benefited less from these projects due to the rise of private research institutes and a shift towards 'high-quality' or 'non-practice-based' research at universities. This shift has aligned university research more closely with the Deutsche Forschungs-gemeinschaft (German Research Foundation), as vocational education researchers increasingly seek competitive research funding through more theoretical or fundamental research related to the global scientific competition.

VET systems and VET teacher education in Sweden and the Nordic countries

The objective of this section is to provide an overview of the evolution of VET teacher training in Sweden over the past century, situated within the broader context of VET development in the country. Sweden has been chosen as a case study for the Nordic countries due to two key factors: firstly, the shifting dominance between Sweden and Denmark among the five Nordic countries in history, accompanied by armed conflicts between the kingdoms (Øystein & Stråth, 1997), which leads to many similarities across these nations, and secondly, Sweden's status as the largest country in the region by population.

While Germany's dual system maintains a clear separation between general and vocational education, Sweden's model integrates both within a single institutional framework, allowing students to engage in VET within a general school setting at upper secondary schools. This system evolved differently across the Nordic countries but can be traced back to early developments, such as the creation of technical colleges. Nilsson (2008) notes that by the 1870s, Sunday and evening schools became the largest providers of technical education, although the level of technical training was still relatively basic. The expansion of adult education laid a foundation for broader access to technical education, which was further institutionalised with the establishment of VET schools in 1918.

The establishment of the VET School (yrkesskola) in 1918, followed by the creation of Verkstadskola for students without access to work placements, marked a significant shift in Swedish VET. The Verkstadskola, which used

productive work as a pedagogical tool, achieved remarkable success. By the late 1930s, economic difficulties had enabled this alternative model to become the core of Sweden's VET system, effectively replacing the traditional apprenticeship system (Kaiser, 2023). Michelsen and Stenström (2018, p. 14) observe, 'The state-led rise of the comprehensive school in Sweden meant that firm-based apprentice skill formation was threatened and eradicated.'

The interrelation of the similarities and differences in the structures and the historical development in the Nordic countries are described in a book series by Helms Jørgensen and colleagues (e.g., Helms Jørgensen et al., 2018; Michelsen & Stenström, 2018) through an extensive international comparative analysis including Finland, Denmark, Sweden, and Norway. The volume on historical development by Michelsen and Stenström (2018) in particular provides a comparison of the key political events in the countries; the liberalisation of VET (1850–1945), the social democratic regime (1945–1990), and the last phase, called again liberalisation (1990–2015). They also point out in the final reflections, bringing in a 'possible Nordic model', which is referring to the trade-off between VET and Higher Education, described a 'social democratic skill formation system' (Michelsen & Stenström, 2018, pp. 225–226).

It is therefore undisputed that the Swedish or Nordic model of 'integration' of VET into upper secondary schools has similarities in the Nordic countries, leading to the establishment of comprehensive vocational training workshops in Finland, Iceland, Denmark, and Norway. These facilities offer students practical training opportunities in fields such as construction and automotive engineering. For these workshops to function effectively, teachers must be experts in their respective trades or professions (Remember the trade paradigm in Grollmann & Rauner, 2007, mentioned before). Related to 'integration' Finland is an exception because vocational schools have continued as clearly separate institutions. Legislation and funding are also separate. The 2018 VET reform was a step towards merging VET for youth and adults (Virolainen, 2021).

The development of VET teacher education and its challenges in Sweden

The period from the late 19th century into the early 21st century marked significant transformations in the professionalisation of VET teachers in Sweden. This period was critical, as VET increasingly became a cornerstone of Sweden's industrial and economic development. However, several obstacles hindered the creation of a consistent system that could effectively link experience-based learning in the workplace with the development of pedagogical skills, knowledge, and competence needed to design vocational curricula. These obstacles included political resistance, financial constraints, and a shortage of instructors with both practical and pedagogical expertise.

In the late 19th century, the importance of teacher qualifications for technical education was often overlooked. For example, the Swedish physicist and head of the Institute for Technology Lars Johan Wallmark's 1850 proposal suggested that teachers from general technical schools should also work in evening schools to meet industrial needs, but no structured training system was established to support this idea. In 1907, the Technical Commission (Tekniska kommittén) recognised the need for VET teacher education; however, no formal programme was developed at the time (Hedman, 2001).

In 1918, the Swedish Parliament proposed the establishment of a State Normal School for Vocational Education (Statens normalskola för yrkesundervisning), but the government postponed its implementation, leading to ongoing uncertainty in the field of VET teacher education. It was not until 1920 that the National Centre for VET pedagogics (Yrkespedagogiska Centralanstalten) was founded, offering short pedagogical courses for both practising and future VET teachers. These courses, lasting between three and six weeks, covered subjects such as educational psychology, teaching methods, and practical exercises. Despite its limited size and direct government control, this institute played a critical role in the early years of VET teacher education. However, the institute faced significant challenges, including a shortage of qualified instructors and difficulty balancing practical expertise with teaching skills (Hedman, 2001).

Political opposition to centralised vocational teacher education led to budget cuts, with claims that there was insufficient demand to justify the existence of a specialised VET teacher training institution. As a result, the Yrkespedagogiska Centralanstalten closed in 1929 due to political and financial pressures, with its responsibilities transferred to the Vocational School Department (yrkeskole-avdelningen) in the ministry, weakening the focus on structured teacher education. The closure in 1929 represented a major setback in the effort to establish structured VET teacher education. The economic crises of the 1930s, combined with inconsistent government support, further hindered efforts to reform this kind of education until after World War II (Hedman, 2001).

From the 1940s onward, the demand for VET teacher education in Sweden increased significantly. By 1950, the training period had expanded from five to 15 weeks, and by 1960, it had reached 33 weeks. In 1973, training for teachers in industries and skilled trades was extended to 40 weeks (Dir. 2008:41). These incremental reforms laid the groundwork for the more comprehensive training programmes seen in the present day, with a stronger focus on pedagogy and the integration of practical teaching experience

Reforms to upper secondary and adult education in the early 1990s introduced new requirements for VET teacher education. A 1993 study led to the publication of the report *Höj ribban!* (Raise the Bar!), which recommended that VET teacher candidates complete at least 80 university credit points alongside their vocational

education and work experience (SOU 1994:101). At that time one full-time study year in Sweden was 40 credit points (40 weeks), but since the Bologna process with the new ECTS one year/40 weeks are 60 (ECTS) credit points. By 1996, additional changes required 40 credit points for VET teacher certification, and 60 credit points were necessary to teach a general subject (Dir. 2008:41). In 2011, teacher training was further consolidated under a new VET teacher degree (yrkeslärarexamen). The training now required 90 credit points; 1.5 years full time studies in pedagogy for VET teachers. The prior vocational education/ qualification is a requirement for admission (UHR, 2024).

But until the 1990s the VET teacher certificate remains under academic level measured in an institutional perspective. Vocational teacher training was offered at specialised institutions until the mid-1990s and typically lasted one year. Admission requirements included basic vocational training and at least seven years of professional experience. Then, the VET teacher students followed a general programme that was also for general subject teachers, and they had to write a bachelor's thesis within their programme. However, a 2008 study (Dir. 2008:41) revealed that from the mid-1990s to 2009, demand for trained VET teachers had tripled, while applications for VET teacher education had sharply declined (Prop. 2009/10:89).

In response, the government's 2009 proposal, *Bäst i klassen: En ny lärarutbildning* (Best in class: A new teacher training) (Prop. 2009/10:89), introduced four standardised teacher qualifications: preschool (förskollärar-examen), basic/primary school (grundskollärarexamen), subject (ämneslärar-examen), and VET teacher (yrkeslärarexamen), with a focus on pedagogy, didactics and subject knowledge for the three first mentioned teacher profiles.

Although recent reforms have increased the pedagogical requirements for VET teachers, they are still academically less qualified compared to the other teachers. VET teachers must now complete a university programme consisting of at least 90 ECTS credits, with 60 credits dedicated to pedagogy and didactics, and 30 to practical teaching experience, but no requirement for writing a thesis anymore. Those with prior teaching experience may be exempt from the practical component of their training.

Despite these formal requirements, a significant number of VET teachers in Sweden still lack full qualifications. For instance, in the automotive sector, the qualification rate remains below 50%. A 2016 Cedefop forecast predicts a shortage of 4,500 VET teachers by 2035 (Cedefop, 2016). This shortage is compounded by factors such as insufficient enrolment in teacher training programmes, competition from the private sector for skilled workers, and a lack of incentives for VET teachers to pursue further qualifications. Although the government aims to ensure that all of these teachers are fully qualified by the mid-2020s, achieving this goal remains a significant challenge. Given the current

rate of qualified VET teachers and the challenges in increasing enrolment in teacher education programmes, it remains uncertain whether this goal can be fully achieved without additional reforms or financial support.

Similarities and differences of VET teacher education to the other Nordic countries

Even though the systems in the individual countries differ considerably, general education subjects are taught by general education teachers in Sweden and the other Nordic countries. So it is not necessary for VET teachers to be trained in a second subject as in Germany. For example, Finland has implemented a competence-based approach for several years, enabling students to make their education more flexible. Legislation on pedagogical qualifications for teachers has since 1998 referred to comprehensive and gymnasium schools, vocational schools and universities of applied sciences, folk high schools etc. (excluding early childhood, primary schools, and universities). Thus the 'studies/certificate' of teachers' pedagogical qualification for all these institutes can be achieved in Åbo Akademi University for Swedish speaking parts of the country in Vasa and in several VET teacher training units of Universities of Applied Sciences (UAS) like in Hämeenlinna, Helsinki, and Oulu. This system allows students to shorten or lengthen their education according to their circumstances, extend it by incorporating longer periods of work and practice, or take individual qualification modules as adults to supplement their own qualifications as needed (Virolainen & Stenström, 2014).

In contrast, the structures in Sweden were much less flexible for a long time (Panican & Paul, 2019). Only in recent years has a system become established in which learning at the workplace plays a greater role, and the skills and knowledge acquired there are systematically integrated into school education (Skolverket, 2018). This shift has implications for VET teacher training, as teachers in Sweden now need to be adept not only in their subject matter but also in integrating workplace learning into formal education. It is therefore their responsibility to ensure that learning can take place at the workplaces in the companies in accordance with the school's curriculum. To this end, they also have to steer discussions between the practice, the trainees, and the school as a triangle and to control what happens at the workplaces (Lagström, 2012).

This form of practice orientation has long been developed in Icelandic VET, depending on the sector. The variation in the use of log book-journals or more rudimentary forms to follow up on what is happening at the workplaces is largely due to differences in sector-specific requirements, with more formal sectors like healthcare relying heavily on documentation and others, like agriculture, focusing more on hands-on training (Eiríksdóttir, 2020).

In Norway, students spend the first two years of their four-year training more or less at school, followed by two years of practical training in an apprenticeship. This creates more demanding requirements for VET teachers, who not only teach but also assist students in finding a company for their practical training (look at the contribution of Gjelstad in this special issue). Moreover, VET teachers are responsible for helping students develop systematic work habits and professional behaviour, often in collaboration with colleagues (Nore, 2015; Rapp et al., 2023). To equip VET teachers for this dual role, teacher education in Norway includes modules on career counselling and collaboration with industries to help students secure work placements. During a school visit in Arendal, Norway, a VET teacher commented: 'They have to learn what it means to work, first. That has to happen here in the workshop, before they can get a place in the working life' (Teacher in Arendal, Norway, 2023).

It is important to understand the differences between the various VET systems and the historical context that has led to these divergences. As mentioned earlier in the description of the VET teacher education in Germany, a conceptional model was developed in 2018/19 to simplify the comparison of pathways to becoming a VET teacher (Kaiser & Lindberg, 2019). This approach was applied to the data in Figure 1 and Table 1. Now Table 2 highlights key differences in VET teacher education pathways, including the varying emphasis on academic versus practical experience and the role of formal qualifications in different countries. This comparison reveals not only the diverse entry requirements but also the varying levels of importance placed on vocational experience versus formal education across these Nordic countries. The findings are based on original research and expert interviews during the VETteach-project conducted in 2023.

Looking at Table 2, it becomes clear that there is no single, typical pathway to becoming a VET teacher, either in international comparison or within the national context (Grollmann & Rauner, 2007). In Germany we have several pathways as well, but more or less only one official model, as shown in Table 1. Although the requirements for high-level vocational expertise are similar across the Nordic countries, there are notable differences in the pathways. For example, Finland requires significantly higher levels of academic expertise than Sweden, Norway, or Iceland for entry into the academic programme. In Iceland, a combination of vocational training and on-the-job experience is often sufficient, whereas in Finland, a more extensive academic background is required. These different pathways lead to varying levels of teacher preparedness, with more academically rigorous pathways potentially leading to more comprehensive training, while practice-based approaches can emphasise immediate, real-world applicability.

Table 2. VET teacher education and profession in four Nordic Countries.

	Input		Process			Output
Country	*Entry requirements*	*Provider*	*Duration*	*Content and methods*	*Assessment*	*Job opportunities*
Norway	Model A: trade certificate & 2 years work experience Model B: professionally oriented BA & 2 years work experience	Universi-ties or University colleges	Model A: 180 ECTS Model B: 60 ECTS	Teaching practice, working process analyses, competence orientation, democracy, personalised develop-ment, peer learning, self-assessment	Model A: Bachelor thesis Modell B: portfolio assessment Approval of pedagogical practice	Upper secondary school (VET pro-grammes)
Finland	Bachelor / Master and 3–5 years work experience	Universi-ties of Applied Science / Åbo Akademi University	60 ECTS	Similar to Norway	Formative portfolio, written papers	VET schools, adult education, advanced VET, Universities of Applied Science
Iceland	Model A: MA in professional field Model B: VET and experience	University of Iceland	Model A: 60 ECTS, 1 ½ year parttime Model B: 180 ECTS BA (seldom)	Teaching practice, goals of pedagogy, psycho-logical basics of learning	Modell A: Portfolio Modell B: BA thesis	VET schools
Sweden	Basic eligibility for higher education Vocational competence in vocational subject(s) EQF level 5	Universi-ties and University colleges	90 ECTS, typically 3 years, Credit for VET teaching expe-rience possible	General vocational pedagogy (didactics) Often distance education 30 ECTS practicum	University responsi-bility Varying models	VET schools, sometimes only in parts of VET programmes

In a small labour market like Iceland's, practical experience is often prioritised over formal education because it allows for greater flexibility and adaptability in response to the needs of local industries and it is much easier to get VET teachers and to offer them the flexibility to return in other jobs. The accumulation of professional experience across diverse organisational contexts and occupational

domains becomes a more significant factor. As a result, additional pedagogical qualifications acquired during university studies are often required, though these do not necessarily lead to accredited degrees like a Bachelor's or Master's in Sweden, Norway, or Iceland. This is largely because the qualifications do not reach the duration, required scientific depth and breadth for academic degrees.

Nevertheless, VET teachers are held in similar esteem as secondary-level teachers in other subjects, especially in the schools of Iceland and Finland, even though the latter have often undergone more extensive academic training. This parity is evidenced by comparable salaries and opportunities for advancement within educational institutions. One special aspect of Finland should also be mentioned, which certainly goes hand in hand with the particularly high reputation of VET teachers. A degree in this teaching profession for VET schools and three years' occupational experience is also a prerequisite for employment as a lecturer at a university of applied sciences when holding a MA or UAS degree as well.

Effects on research and the science of VET in Sweden and the Nordic countries

When attending vocational education research conferences in Sweden, it becomes clear that a large number of the next generation of researchers from Norway and Sweden in the field of VET focuses primarily on the didactics of their vocational specialisations, teaching practices, or exams (Lindberg et al., 2014). Their research rarely addresses systemic structures, the historical development of VET, international comparisons, or educational theories from fields like sociology, political science, or adult education. From a German perspective, many of these VET-related researchers come from initial VET backgrounds, often having spent extended periods working as VET teachers, which explains their focus on topics closely related to their professional experience they had before. As a result, their doctoral theses are seldom part of broader research projects or grounded in complex theoretical or methodological frameworks, which are more commonly seen in Germany. This 'distance' from foundational scientific research and theory-building can be attributed to the way vocational education and training and VET teacher education are structured in Sweden, as previously discussed.

The state of vocational education research in Sweden was systematically analysed for the first time by Lindberg (2004). Lindberg noted that, aside from some historically oriented dissertations, most research on VET and its culture has been conducted by researchers with backgrounds in sociology or macro-economics. This pattern is evident in larger studies such as 'Nordvet', the Scandinavian research project, mentioned before (Helms Jørgensen et al., 2018).

Researchers with direct vocational education backgrounds, who study teaching concepts, didactics, disadvantaged groups, teacher training, or the political objectives of VET, and who publish internationally, have remained relatively scarce until the early 2000s (Lindberg, 2004). In the last decade, two doctoral programmes in Sweden funded by the Swedish Research Council (Vetenskaps-rådet) have played a vital role in promoting international exchange and contributing to the professionalisation of Swedish vocational education research.

In Sweden, the shift of VET teacher training to universities (Asghari & Berglund, 2020) has increased research capacity, with new professorships established at universities and university colleges such as in Karlstad, Växjö (Linnæus University), Kristianstad, and Falun (Dalarna University). The increase in professorships has contributed to a greater emphasis on vocational education research, leading to more research output and enhancing the academic foundations of the field.

Neither Sweden nor any other Nordic countries have a state-run research institution explicitly dedicated to VET, similar to the BIBB in Germany. Instead, oversight of vocational education is embedded within central school authorities, such as Skolverket in Sweden, with similar setups in other Nordic countries. Small studies are sometimes commissioned by these authorities and conducted by the scientific staff at the universities. Besides the growing output of research on VET in the Nordic countries, there are still no private research institutes specialising in VET, or a VET specific research association in Sweden, like the BWP-section in the National association of Educational research founded 50 years ago in Germany (Kaiser, 2023).

However, in Iceland, where there is only one university with a VET research focus and one professorship responsible for VET teacher programmes, the implementation of larger research projects and broader cross-regional cooperation remains a significant challenge.

In Finland, VET teacher education takes place at five universities of applied sciences and one Swedish-speaking university, the Åbo Akademi University with the campus in Vasa. However, most of the lecturers at the UAS do not hold full professorships, which limits their ability to supervise PhD students as primary supervisors for a long time. This restriction hampers their research capacities, meaning lecturers must go to traditional universities to obtain their doctoral degrees.

There are a few journals in the Nordic countries dedicated to VET research. A Finnish-language journal on VET (https://akakk.fi/) is published by the Finnish Vocational Educational Research Association (OTTU) and the Foundation for Teaching, Education and Personal Development (OKKA), while publication of the Nordic Journal of Vocational Education and Training with a Nordic editorial board has been supported by the Swedish Research Council. In recent years,

there has been an increase in professorships for vocational pedagogy at Swedish universities. Similarly, Norway has seen the establishment of VET-related professorships at universities in Trondheim, Bergen, Kristiansand, Tromsø, and Oslo. Until a few years ago, most of these were universities of applied sciences with a strong focus on subject didactics in their degree programmes.

The NORDYRK conference has played a key role in facilitating the exchange of methods and ideas in vocational education research in the Nordic countries as well. This international conference allows presentations in Swedish, Danish, Norwegian, and English, offering young researchers opportunities to build international collaborations and gain deeper insights into developments across the Nordic countries. NORDYRK held its first conference in Umeå in 2009 and has since held annual conferences in different Nordic countries. Another important conference, held annually in English since 2012 in Stockholm, provides an additional forum for international engagement (Moreno Herrera et al., 2019). Currently, vocational education research in the Nordic region is transitioning from 'amateurish science' to 'emerging academic science,' as described by Clark (1973).

In conclusion, there is a clear link between the academisation of VET teacher education and the establishment of VET research as a scientific field. The longer academic programmes become, the more researchers and lecturers are needed, which in turn leads to the creation of more professorships at universities. This increase in research manpower generates more publications, journals, and conferences, further establishing the field of VET research (Götzl et al., 2019; Kaiser, 2021). From the perspective of young researchers looking to establish themselves in the field, these factors support the case for further academic drift in vocational education research.

The following section will explore the side effects and broader implications of this trend.

Caught between the demands of academic and vocational education

VET aims to equip individuals with the skills and knowledge necessary for employment while remaining adaptable to changes in the future. At the same time, the democratic constitutions of the countries analysed, demand that learners develop skills for active citizenship, as well as the ability to confront contemporary global challenges, such as the planetary crisis (Alam et al., 2023). For instance, in Iceland, these demands are reflected in the six pillars of education (see Figure 3). These six pillars – literacy, sustainability, creativity, health, democracy, and equality – serve as guiding principles for Iceland's education system. They emphasise not only academic competence but also the importance of preparing students for active participation in society, which aligns with

vocational education's broader goal of developing adaptable, responsible professionals.

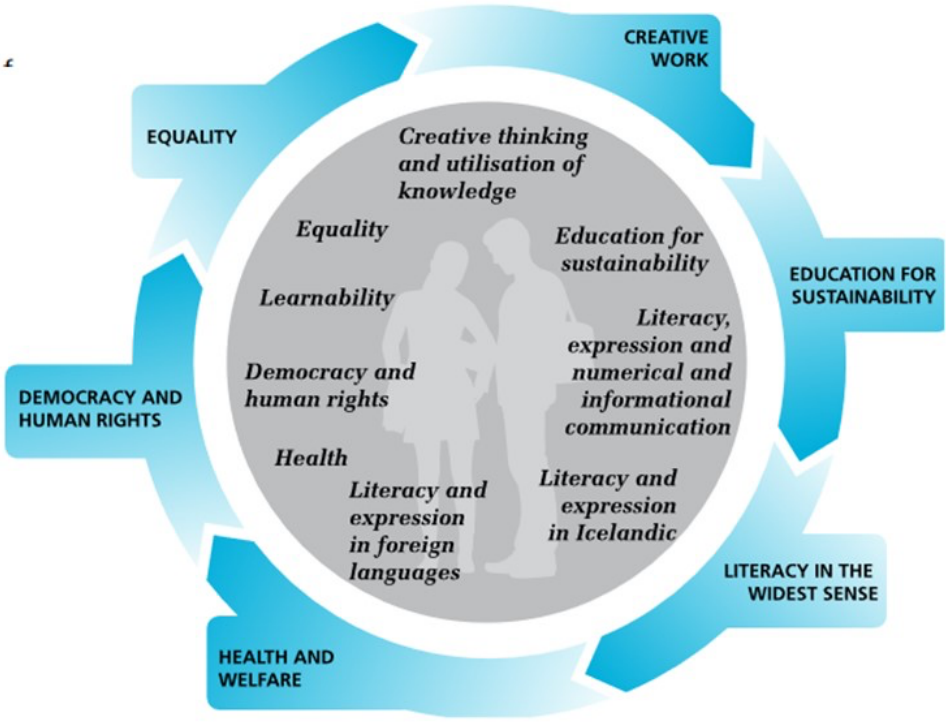

Figure 3. The six pillars of education in Iceland (Ministry of Education, Science and Culture, 2014, p. 14).

This requires learners in initial VET to not only master technical skills but also develop the capacity for critical thinking, social awareness, and responsible professional action. They must be encouraged to express contradictions, which fosters a stable sense of self-worth and a deep understanding of social contexts, including workplace dynamics such as unions (Kaiser, 2024). Professional competence involves interacting appropriately with customers and colleagues and making decisions aligned with sustainability goals.

Volanen from Finland captures the dilemma many professionals face:

> As professionals we all find ourselves confronted with a conflict between our own work and the basic problems of our era: how should I solve the problems I face in my own work if I look at them as, for instance, as a parent, a citizen or a human being, not just an employee. What solution emerge for my examination when I consider my professional problems from all these various angles? (Volanen, 1999, p. 172)

This tension, between the demands of professional expertise and the broader responsibilities to society, shapes the reality of VET in every country.

However, an overemphasis on general skills and educational goals can have detrimental effects, as seen in the Nordic countries. For example, in Sweden, placing focus on non-vocational content in upper secondary schools – aiming at preparing students for university entry – led to higher dropout rates in VET programmes and increased youth unemployment (Kaiser, 2023). Similar trends are observed in Norway, where greater motivation stems from practical, hands-on learning (Nyen & Tønder, 2018). On the other hand, it is important to note that participation rates in VET programmes in Sweden tend to decline when access to university from these programmes becomes more difficult. As a result, both parents and students increasingly favour educational pathways that provide broader opportunities and flexibility for the future. This may be one reason why participation rates in Norway are higher in the VET programmes compared to Sweden – it is an easy way to gain access to university with an extra year of schooling.

Lindberg (2014) argues that VET must prioritise practical workplace competence. Vocational knowledge is a form of situated judgment, combining the language of the trade – tools, materials, methods, techniques, planning, and ethics – with hands-on experience. Tacit knowledge, or the unspoken understanding gained through practice, plays a vital role in the interaction between these elements. For example, a VET teacher in the automotive field may struggle with the tension between teaching the theoretical foundations of engineering and ensuring students can perform hands-on tasks like engine diagnostics. The teacher must not only convey the theoretical principles behind car mechanics but also ensure that students can apply this knowledge in a real-world setting – an approach that integrates both academic rigour and occupational skill development. Recognising the distinctions between VET and academic learning is crucial, as these differences create the tension that defines the education and teaching of VET teachers.

The goal of VET is to master practical skills and tools while joining a community of practice, a setting that supports further development through collective learning. Competence is developed through practice, observation, and experimentation. Professionalism is achieved by refining routines that allow practitioners to focus on the finer details of their work, as the foundational processes become second nature. Quality is assessed through measurable comparisons to set objectives, whether they relate to product specifications or meeting customer expectations. As one student describes in a Norwegian study of Marit Lensø:

> To become an expert craftsman, it is not enough to do a bit of screwing and carpentry on your own; there is so much more behind it. Our vocational teacher's professional

> pride shaped us positively. Because of him, it was important for us students to do our best. It was clear to us that he performed his craft with deep respect. Through him, we understood that it was important to be exact and concentrated. We worked hard to learn and to show him that we were serious too. (Carl) (Lensjø, 2024, pp. 341–342)

In contrast, academic learning seeks to understand and master the thinking and methods of scientific disciplines, with the goal of contributing new knowledge. Rather than focusing on practical competence and solutions, academic learning emphasises understanding, theory, and analysis.

Academic education, however, is traditionally rarely designed to prepare students for real-world work, except in the context of academic or research careers. As a result, exploring the processes involved in performing tasks and the associated trial work is rarely part of the academic curriculum, with the exception of some practical courses in engineering and medicine. Prospective VET teachers often find themselves disappointed because their university studies do not directly align with the aims of VET, where practical skills are emphasised (Carnein et al., 2023). This disconnect can cause frustration when students expect their studies to lead to better teaching through repetition and practice.

Finland's competence-based approach in higher education offers an interesting model that bridges vocational and academic learning. By focusing on the development of both practical skills and theoretical understanding, Finland allows students to pursue higher education without losing the hands-on, applied aspects of VET. Here, students refine their ability to present and develop their own ideas, contributing to scientific discourse. Quality assurance comes through engagement with established research, logical procedures, evidence-based work, and transparent, ethical approaches. This integration could serve as a model for other countries, where vocational and academic education often remain more separate.

To bridge the gap between academic and vocational learning, it is essential to make prospective teachers aware of the difference between acting according to instructions and developing innovative, creative professional practices. As professionals, they must influence the structure of VET systems and design teaching and assessments that encourage active learning. Vocational teaching is not merely about applying knowledge or didactic methods but requires critical reflection and social imagination (Kaiser, 2024). Teaching, in this context, becomes a creative art, requiring more than adherence to routines or methods – it requires the ability to shape a learning community that reflects broader societal and professional contexts (Rasmussen, 2021).

Conclusion and limitations

In order to provide insights into the similarities and differences in the development of VET teacher education in several countries, it is necessary to reduce complexity and find a middle ground between showing relevant details and creating an overview of the main tendencies. This approach is limited in its stringent use of elaborate research methods like systematic literature reviews for summarised insights into the structures of the various Nordic countries and Sweden in particular. The valuable and complementary insights in practice at schools and the talks with stakeholders used here are not based on a systematic concept or on previously defined categories. Rather, the order followed opportunities and the willingness of school administrators and colleagues on site to grant access and be prepared to engage in dialogue.

This could be significantly improved for future research through specific questions, hypotheses, and appropriately developed research methods. But still, the study draws on surveys from the previous EU project 'VETteach' which have been reported on in more detail elsewhere.

Nevertheless, the evolution of VET teacher education in Germany, Sweden, and the broader Nordic countries reveals ongoing tensions between the academic demands placed on teachers and the practical skills required for VET. The increasing academisation of VET teacher pathways, while advancing theoretical foundations and enhancing professional status, has also introduced challenges, particularly in balancing academic and vocational competencies.

The shift towards more academically oriented teacher education programmes has undoubtedly elevated the status of vocational education, aligning VET teachers with their counterparts in general education. This development has led to a stronger focus on pedagogical theory, critical thinking, and research-based methods, especially in countries like Germany and other German-speaking countries, where vocational education has become a well-established field of academic inquiry. However, this trend also raises concerns about the possible disconnect between academic learning and the hands-on, work-process-oriented skills that vocational teachers need to impart to their students. One bitter consequence of the associated increasing distance between academic research and teaching, on the one hand, and the knowledge and analytical tools actually required in the everyday work of teachers at vocational schools in Germany, on the other hand, is the almost complete non-involvement of universities in the second and third phases of teacher training.

In Sweden and the Nordic countries, the effects of this academic drift are particularly pronounced, as VET systems that once prioritised practical skills now emphasise more academic qualifications. While this shift offers VET teachers greater professional recognition, because they are part of the upper

secondary school, it also risks alienating vocational education from its roots in practical, workplace-based learning.

To address these challenges, VET teacher education systems must find ways to integrate academic rigour with practical competence. Strengthening practice-based learning within VET teacher programmes is essential to ensure that teachers not only excel in pedagogical theory but also retain the ability to guide students in developing essential technical and practical skills. Moreover, fostering interdisciplinary research that draws on insights from sociology, political science, and education theory could enrich the study of VET, allowing for a more comprehensive understanding of its role within society and the economy.

In this context, international collaboration and knowledge exchange will also play a key role in shaping the future of VET teacher education. Conferences such as NORDYRK have already created valuable platforms for dialogue, helping to align vocational education research across the Nordic countries and beyond. These forums will be critical in continuing to refine VET systems, ensuring they remain responsive to the evolving demands of the labour market and global challenges, such as sustainable development and digital transformation.

At the same time, however, study circles, meetings, and conferences would also be necessary at which active VET teachers could discuss and exchange information on trends and solutions in everyday teaching work, as was the case in its origins and is still partly the case today in the 'Hochschultage berufliche Bildung' (Academic Days for Vocational Education and Training) in Germany, at which there are specific sub-conferences on vocational specialisms and general education subjects were practitioners in school meet researchers.

Ultimately, the academisation of VET teacher education has brought significant benefits, but it also presents critical challenges that need to be carefully navigated. Ensuring that VET retains its practical focus while embracing academic advancements will be key to its ongoing success. By fostering a more integrated approach, where both theory and practice coexist harmoniously, it is recommended that learning methods from VET be utilised in order to ensure adequate preparation for VET teachers. This is needed to cope with the complexities of modern work and society, ensuring its relevance and impact in an ever-changing world. In this context, the sustainable development goals and their increasing importance in educational discourses can lead to a practice-orientated expansion of the understanding of vocational education and training (Schütt-Sayed et al., 2021).

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References

Alam, S., Heikkinen, A., & Molzberger, G. (2023). Technologisation as the planetary solution for environmental care and social progress? Critical questions to vcational and adult education. In A. Heikkinen, & N. J. Jinia (Eds.), *Environmental care and social progress: (Im)possible connection?* (pp. 75–100). Osder.

Asghari, H., & Berglund, I. (2020). Svensk yrkeslärarutbildning efter reformen 2011: Lärarstudenters uppfattningar om antagning, VFU och läraranställning [Swedish vocational teacher education after the reform 2011: Teacher students' perceptions of admission, practicum internship and teacher appointment]. *Nordic Journal of Vocational Education and Training*, *10*(2), 21–43. https://doi.org/10.3384/njvet.2242-458X.2010221

Bauer, W. (2007). TVET teachers and instructors in Germany. In P. Grollmann, & F. Rauner. (2007). I*nternational perspectives on teachers and lecturers in technical and vocational education* (pp. 123–158). Springer.

Brechmacher, R., & Gerds, P. (1993). Grundmodelle der Gewerbelehrerbildung im historischen Wandel [Basic models of vocational teacher training in historical change]. In A. Bannwitz, & F. Rauner (Eds.), *Wissenschaft und Beruf: Berufliche Fachrichtungen im Studium von Berufspädagogen des gewerblich-technischen Bereiches* [Science and profession: Branchspecifics in the curriculum of vocational teachers in the industrial-technical field] (pp. 38–60). Donat.

BIBB. (2010). *40 Jahre Bundesinstitut für Berufsbildung: 40 Jahre Forschen – Beraten – Zukunft gestalten* [40 years of the Federal Institute for Vocational Education and Training: 40 years of researching – advising – shaping the future]. BIBB.

Brüchner, M., Isik, B., & Riehle, T. (2024). Kompetenzorientierte Lehrer:innen-bildung für die berufliche Bildung der Fachrichtung Metalltechnik [Competence-based teacher training for vocational training in metal technology]. In M. Niethammer, M. Schweder, & M. Liebig (Eds.), *Didaktiken der Beruflichen Fachrichtungen: Optimierung getrennt-gemeinsam denken* [Didactics of the vocational disciplines: Thinking optimisation separately – together] (pp. 253–274). Wbv. https://doi.org/10.3278/9783763974375

Busemeyer, M., & Trampusch, C. (2012). The comparative political economy of collective skill formation. In M. Busemeyer, & C. Trampusch (Eds.), *The political economy of collective skill formation* (pp. 3–38). Oxford University Press.

Carnein, O., Damnik, G., Krause, G., & Vanier, D. (2023). *Spezifische Aspekte von Trainings pädagogischer Kompetenzen in Abgrenzung zu anderen Lehr-Lern-Situationen in der Lehrkräftebildung* (Tagungsband) [Specific aspects of training in pedagogical competences in contrast to other teaching-learning situations in teacher training (Conference documentation)]. University of Rostock RosDok. https://rosdok.uni-rostock.de/resolve/id/rosdok_document_0000023205

Cedefop (2016). *Vocational education and training in Sweden* (VET in Europe reports). https://cumulus.cedefop.europa.eu/files/vetelib/2016/2016_CR_SE.pdf

Clark, T. N. (1973). *Prophets and patrons: The French university and the emergence of the social sciences.* Harvard University Press.

Dir. 2008:41. *Utbildning till yrkeslärare* [Training of VET teachers]. https://www.regeringen.se/rattsligadokument/kommittedirektiv/2008/04/dir.-200841/

Eiríksdóttir, E. (2020). Program coherence and integration of school- and work-based learning in the Icelandic dual vocational education and training (VET) system. *Education Science*, *10*(11), 314. https://doi.org/10.3390/educsci10110314

Fahle, S., Faßhauer, U., Kaiser, F., & Krugmann, S. (2016). Buntes Bild trotz KMK-Vorgaben: Kooperative Studiengänge des Lehramts für berufliche Schulen [Colourful picture despite state requirements: Cooperative study programmes for the teaching profession at vocational schools]. In T. Bals, A. Diettrich, M. Eckert, & F. Kaiser (Eds.), *Diversität im Zugang zum Lehramt an berufsbildenden Schulen: Vielfalt als Chance?* [Diversity in access to the teaching profession at vocational schools: Diversity as an opportunity?] (pp. 67–92). Eusl.

Deißinger, T. (1998). *Beruflichkeit als "organisierendes Prinzip" der deutschen Berufsausbildung* [Beruflichkeit as the 'organising principle' of German vocational training]. Eusl.

Götzl, M., Geiser, P., Jahn, R. W., & Frind, H. (2019). The academic institutionalisation of VET as a science in the German-speaking area: A collective biographical and network analytical study of discipline formation in the 20th century. In F. Marhuenda, & M. J. Chisvert-Tarazona (Eds.), *Pedagogical concerns and market demands in VET* (pp. 1–9). https://doi.org/10.5281/zenodo.2641693

Gonon, P. (2020). Dilettantismus als Dispositiv: Zur disziplinären Entwicklung historischer Berufsbildungsforschung [Dilettantism as a dispositive: On the disciplinary development of historical vocational training research]. In F. Kaiser, & M. Götzl (Eds.), *Historische Berufsbildungsforschung: Perspektiven auf Wissenschaftsgenese und -dynamik* [Historical vocational training research: Perspectives on the genesis and dynamics of science] (pp. 32–48). Eusl.

Gonon, P., & Bonoli, E. (2023). Vocational education and training needs a middle range theory – an exploration: History, difficulties and ways of developing a theoretical approach to VET. In *bwp@ Berufs- und Wirtschaftspädagogik – online, Spezial 19: Retrieving and recontextualising VET theory* (pp. 1–20). https://www.bwpat.de/spezial19/gonon_bonoli_spezial19.pdf

Greinert, W.-D. (2004). Die europäischen Berufsausbildungssysteme: Überlegungen zum theoretischen Rahmen der Darstellung ihrer historischen

Entwicklung [The European vocational training systems: Reflections on the theoretical framework of the account of their historical development]. *Europäische Zeitschrift Berufsbildung*, *32*(2), 18–26.

Grollmann, P., & Rauner, F. (Eds.). (2007). *International perspectives on teachers and lecturers in technical and vocational education*. Springer.

Hägele, T., & Pangalos, J. (2012). Entwicklung der Gewerblich-Technischen Wissenschaften im Zeitraum von 1998 bis 2009 [Development of comercial-technical sciences in the period from 1998 to 2009]. In M. Becker, G. Spöttl, & T. Vollmer (Eds.), *Lehrerbildung in Gewerblich-Technischen Fachrichtungen* [Teacher education in comercial-technical branches] (pp. 65–96). wbv.

Hedman, A (2001). *I nationens och det praktiska livets tjänst: Det svenska yrkesskolesystemets tillkomst och utveckling 1918 till 1940* [In the service of the nation and practical life: The development of the Swedish vocational school system from 1918 to 1940] [Doctoral dissertation, Umeå university]. http://www.diva-portal.org/smash/get/diva2:155640/FULLTEXT02.pdf

Helms Jørgensen, C., Olsen, O. J., & Persson Thunqvist, D. (Eds.). (2018). *Vocational education in the Nordic countries: Learning from diversity*. Routledge.

Hörner, W. (2004). „Europa" als Herausforderung für die Vergleichende Erziehungswissenschaft: Reflexionen über die politische Funktion einer pädagogischen Disziplin ['Europe' as a challenge for comparative education: Reflections on the political function of a pedagogical discipline]. *Tertium comparationis*, *10*(2), 230–244.

Hoppe, M., & Kaiser, F. (2021). Comparing VET teacher education at university level in five European countries. In C. Nägele, B.E. Stalder, & M. Weich (Eds.), *Pathways in vocational education and training and lifelong learning: Proceedings of the 4th Crossing Boundaries Conference in Vocational Education and Training, Muttenz and Bern online, 8.–9. April* (pp. 165–171). VETNET, University of Applied Sciences and Arts Northwestern Switzerland and Bern University of Teacher Education. https://doi.org/10.5281/zenodo.4636423

Kaiser, F., & Lindberg, V. (2019). Vocational teachers in the Swedish and Finnish vocational education systems. In F. Marhuenda, & M. José Chrisvert-Tarazona (Eds.), *Pedagogical concerns and market demands in VET* (pp. 301–307). Valencia University. https://zenodo.org/records/2641712

Kaiser, F. (2020). Reflections on typologies of comparison studies and the necessity of cultural-historical views illustrated by the analysis of the Swedish vocational education system from abroad. In M. Pilz, & J. Li (Eds.), *Comparative vocational education research* (pp. 259–274). Springer.

Kaiser, F. (2021). Academisation of the vocational school teaching profession and the genesis of vocational educational science: A historic country comparison of Sweden, Finland and Germany. *Nagoya University Bulletin*, (4), 1–25.

Kaiser, F. (2023). *Schweden: Bd. 57. Internationales Handbuch der beruflichen Bildung* [Sweden: Bd. 57. International handbook of vocational education]. Barbara Budrich.
https://www.bibb.de/dienst/publikationen/de/download/18911

Kaiser, F. (2024). Let's avoid tilting at windmills, or Why we are studying vocational education and training (VET) with more than just one theory. In *bwp@ Berufs- und Wirtschaftspädagogik – online, Spezial 19: Retrieving and recontextualising VET theory* (pp. 1–29).
https://www.bwpat.de/spezial19/kaiser_en_spezial19.pdf

Kalisch, C., & Kaiser, F. (Eds.). (2019). *Bildung beruflicher Lehrkräfte: Wege in die pädagogische Königsklasse* [Vocational teacher training: Paths to the pedagogical royal class]. wbv.

Lagström, A. (2012). *Lärlingslärare: En studie av hur hur vård- och yrkeslärare uppdrag formas i samband med införandet av gymnasial lärlingsutbildning* [The apprenticeship programme teacher: A study of how the role of the vocational teacher is formulated in conjunction with the introduction of upper secondary school apprenticeships] [Doctoral dissertation, Göteborg Universitet].
http://hdl.handle.net/2077/27999

Lensjø, M. (2024). Vocational teachers' craft knowledge and working-life experiences in building and construction: A narrative study of embodied and tacit learning. *Vocations and Learning, 17*, 333–350.
https://doi.org/10.1007/s12186-024-09344-3

Lindberg, V. (2004). *Swedish vocational education and research in an international context*. Skolverket.

Lindberg, V. (2014). Vocational knowing and the content in vocational education. *International Journal of Training research*, *1*(2), 40–61.

Lindberg, V., Klope, E., Andersson, I., Chrstidis, M., Berg-Christoffersson, G., & Tyson, R. (2014, 9. April). *Two Swedish PhD-programmes in vocational pedagogy: Background, aims and strategies*. [Conference presentation]. ECER, Porto, Portugal.
https://eera-ecer.de/ecer-programmes/conference/19/contribution/32749/

Lipsmeier, A. (2010). Genese der berufspädagogischen Forschung [Genesis of vocational education research]. In F. Rauner (Ed.), *Handbuch der Berufsbildungsforschung* [Handbook of VET research] (pp. 19–27). Wbv.

Marschner, S. (2018). *Zur Institutionalisierung der Berufspädagogik: Eine kollektivbiographische Studie zur Disziplinbildung im 20. Jahrhundert* [Institutionalisation of vocational education: A collective-biographical study of discipline formation in the 20th century] [Unpublished master thesis]. University of Rostock.

Mehnert, H. (2000). Berufspädagogik in historischer Perspektive [Vocational education in historical perspective]. In G. Pätzold, H. Reinisch, & M. Wahle

(Eds.), *Profile der Historischen Berufsbildungsforschung* [Profiles of research on vocational education history] (pp. 87–100). BIS. http://oops.uni-oldenburg.de/632/79/paepro01.pdf

Moreno Herrera, L., Teräs, M., & Gougoulakis, P. (2019). *Emerging issues in research on vocational education & training* (Vol. 4). Premis förlag.

Michelsen, S., & Stenström, M.-L. (Eds.). (2018). *Vocational education in the Nordic countries: The historical evolution*. Routledge.

Ministry of Education, Science and Culture. (2014). *The Icelandic national curriculum guide for upper secondary schools: General section*. https://www.government.is/library/01-Ministries/Ministry-of-Education/Curriculum/adskr_frsk_ens_2012.pdf

Müllges, U. (1967). *Bildung und Berufsbildung: Die theoretische Grundlegung des Berufserziehungsproblems durch Kerschensteiner, Spranger, Fischer und Litt* [Bildung and vocational education: The theoretical foundation of the vocational education problem by Kerschensteiner, Spranger, Fischer and Litt]. Henn.

Nilsson, A. (2008). Vocational education and training in Sweden 1850–2008: A brief presentation. *Bulletin of Institute of Vocational and Technical Education Nagoya*, (5), 78–91.

Nore, H. (2015). Re-contextualizing vocational didactics in Norwegian vocational education and training. I*nternational Journal for Research in Vocational Education and Training*, *2*(3), 182–194. https://doi.org/10.13152

Nyen, T., & Tønder, A. H. (2018). Development of vocational skills through integration of practical training periods in school based vocational education in Norway. In S. Choy, G.-B. Wärvik, & V. Lindberg (Eds.), *Integration of vocational education and training experiences* (pp. 227–241). Springer. https://doi.org/10.1007/978-981-10-8857-5_12

Panican, A., & Paul, E. (2019). *Svensk gymnasial yrkesutbildning: En framgångsfaktor för en effektiv övergång från skola till arbetsliv eller kejsarens nya kläder? [Swedish upper secondary VET: A success factor for an effective transition from school to work or the emperor's new clothes?]*. Swedish ESF Council.

Pilz, M. (2016). Typologies in comparative vocational education: Existing models and a new approach. *Vocations and Learning 9*, 295–314. https://doi.org/10.1007/s12186-016-9154-7

Prop. 2009/10:89. *Bäst i klassen: En ny lärarutbildning* [Best in class: A new teacher training]. Svenska Regeringen. https://data.riksdagen.se/fil/13C34C24-A4DC-4A5A-9CE5-2E0D017F35B7

Pätzold, G. (2011). Akademisierung auf Raten: Der Weg der Gewerbelehrer-ausbildung in die Technische Hochschule [Academisation in rates: The path of industrial teacher training to the technical university]. *Zeitschrift für Berufs- und Wirtschaftspädagogik*, *107*(2), 282–293.

Rapp, A. C., Knutas A., & Smeplass, E. (2023). Bridging gaps in vocational education and training systems in Norway. *Journal of Vocational Education & Training*, 1–19. https://doi.org/10.1080/13636820.2023.2255992

Rasmussen, P. (2021). Public reason, adult education and social imagination. *European Journal for Research on the Education and Learning of Adults*, *12*(1), 15–29. https://doi.org/10.25656/01:21960

Rauner, F. (2006). *Handbuch Berufsbildungsforschung* [Handbook of VET research]. wbv.

Reinisch, H. (2011). *Geschichte der kaufmännischen Berufe* [History of the commercial professions] (Wissenschaftliche Diskussionspapiere 125). BIBB.

Rützel, J., & Schapfel, F. (1994). Professionalisierung von GewerbelehrerInnen: Integrative Studienanteile als Kernstück eines Darmstädter Modells [Professionalisation of VET teachers: Integrative study components as the centrepiece of a Darmstadt model]. In R. Bader, & G. Pätzold (Eds.), *Lehrerausbildung im Spannungsfeld zwischen Wissenschaft und Beruf* [Teacher training in the field of tension between science and profession] (pp. 345–370). Brockmeyer.

Schapfel. F. (1994). Die Eingliederung der Gewerbelehramtsausbildung in die Technische Hochschule Darmstadt im historischen Kontext [The integration of the VET teacher training programme into the Technische Hochschule Darmstadt in a historical context]. In J. Rützel (Ed.), *Gesellschaftlicher Wandel und Gewerbelehrerausbildung* [Societal change and VET teacher education] (pp. 19–32). Leuchtturm.

Schmidt, M. G. (2005). *Sozialpolitik in Deutschland: Historische Entwicklung und internationaler Vergleich* [Social policy in Germany: Historical development and international comparison]. VS.

Schütt-Sayed, S., Vollmer, T., & Casper, M (2021). *Förderung nachhaltigkeits-bezogener Kompetenzentwicklung: Praxisheft für die Ausbildung kaufmännischer Berufe* [Fostering sustainability-related skills development: Practical booklet for training in commercial professions]. BIBB. https://www.bibb.de/dienst/publikationen/de/download/17097

Skolverket. (2018). *Redovisning av uppdrag om statsbidrag för gymnasial lärlingsutbildning 2018* [Report on assignment regarding government grants for upper secondary apprenticeships]. https://www.skolverket.se/getFile?file=4777

SOU 1994:101. *Höj ribban! Lärarkompetens för yrkesutbildning* [Raise the bar! Teacher competences for VET]. https://filedn.com/ljdBas5OJsrLJOq6KhtBYC4/forarbeten/sou/1994/sou-1994-101.pdfsou 1994

Stratmann, K. W. (1994). Die historische Entwicklung der Gewerberlehrer/ innenbildung [The historical development of vocational teacher training]. In J.

Rützel (Ed.), *Gesellschaftlicher Wandel und Gewerbelehrerausbildung* [Societal change and VET teacher education] (pp. 1–18). Leuchtturm-Verlag.

Stratmann, K. W. (1999). Gewerbelehrerbildung zwischen berufsschulpädagogischen Anforderungen und berufsschulpolitischen Ansprüchen [Trade teacher training between vocational school pedagogical requirements and vocational school policy demands]. In G. Pätzold, & M. Wahle (Eds.), *Berufserziehung und sozialer Wandel* [VET and societal change] (pp. 477–505). GAFB.

Thomas, W. (1992). Aufgaben und Ausbildung von Diplom-Ingenieurpädagogen in der ehemaligen DDR vor dem Hintergrund neuer Anforderungen [Tasks and training of graduate engineering pedagogues in the former GDR against the background of new requirements]. In K.-H. Sommer (Ed.), *Lehrer für berufliche Schulen: Lehrermangel und* Lehrerausbildung [VET teachers: Teacher shortage and teacher training] (pp. 331–342). DEUGRO.

UHR. (2024). *Fler utbildade yrkeslärare till skolan* [More trained vocational teachers for schools]. Universitets- och högskolerådet. https://www.uhr.se/globalassets/_uhr.se/publikationer/2024/uhr-skrift-2024-06-26-fler-utbildade-yrkeslarare-till-skolan.pdf

Virolainen, M. (2021). *Case study Finland* (The future of vocational education and training in Europe volume 2. Delivering IVET: Institutional diversification and/or expansion). Cedefop. https://www.cedefop.europa.eu/files/finland_future_of_vet_vol.2.pdf

Virolainen, M., & Stenström, M.-L. (2014). Finnish vocational education and training in comparison: Strengths and weaknesses. *International Journal for Research in Vocational Education and Training*, *1*(2), 81–106. https://doi.org/10.13152/IJRVET.1.2.1

Volanen, M. V. (1999). Bildung through vocational education. In J. Lasonen (Ed.), *Workforce preparation in a global context* (pp. 167–177). Institute for Educational Research, Jyväskylä. https://files.eric.ed.gov/fulltext/ED438405.pdf

Zabeck, J. (2013). *Geschichte der Berufserziehung und ihrer Theorie* [History of VET and its theory]. Eusl.

Zimpelmann, E. (2019). Entwicklungslinien des beruflichen Bildungswesens und der Ausbildung von Gewerbelehrern: Eine historische Analyse [Trajectories of the development of VET and the education of VET teachers: A historical analysis. In *bwp@ Berufs- und Wirtschaftspädagogik – online*, (37), 1–26. http://www.bwpat.de/ausgabe37/zimpelmann_bwpat37.pdf

Øystein, S., & Stråth, B. (1997). *The cultural construction of Norden*. Universitetsforlaget.