

THE HISTORY OF FINNISH VOCATIONAL EDUCATION AND  
TRAINING

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## INTRODUCTION

The early roots of vocational education are to be found in the growth of medieval craft guilds. In many countries apprenticeship training has grown out of the medieval craft guilds' traditions and preserved a central status as a form of initial vocational education and training (IVET). In Finland, however, school-based vocational training is at present the dominant form of initial vocational education. Despite its position as the dominant form of vocational education and training (VET) in the Finnish education system, school-based vocational training emerged on a large scale only during the period of rebuilding that followed the Second World War. Its roots are traceable to the age of industrial breakthrough after the middle of the 19<sup>th</sup> century (Tuomisto, 1986; Väärälä, 1995).

The aim of this paper is to describe and analyse the development of initial vocational education and training (IVET) and its history as well as the present situation of the Finnish VET.

## FROM THE 1800S TO THE SECOND WORLD WAR

### **1800s: From guilds to initial steps of organising vocational education**

Finland was part of the Swedish Kingdom for 500 years (1300–1700). During that time Finland had a function, for example, as a reserve for Sweden's military actions (Heikkinen, 2001). In 1809 Finland became part of the Russian Empire as a Grand Duchy. This period under the rule of the Russian Empire has been seen as decisive for the development of indigenous production, education, and social policy (Heikkinen, 2001). The need for mass production from the wood-processing industry in Western Europe became crucial to Finnish development for the next hundred years. The Finnish strategy at the time was characterized by features such as the use of cheap raw materials, a rural population, and the promotion of self-supportiveness alongside rationalised farming and forestry (Heikkinen, 2001).

Emerging pressure for the development of political and economic structures in Finland was reflected in the statements of an early proponent of the Fennoman movement, the journalist and historian A. I. Arwidsson. Starting in the 1820s he propagated the need to find a shared understanding of the formation of the Finnish nation (Heikkinen, 2001). This required the mobilisation of the common people and abandonment of elitism among the Swedish-speaking upper class, who had mainly formed the industrial elite (Heikkinen, 2001). The period of autonomy under the rule of the Russian Empire gave different social groups the possibility to articulate their political and cultural interests (Heikkinen, 2001). The Fennomans stated the need for schools, including vocational schools.

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The development of Finnish VET started when Finland became an autonomous Grand Duchy of the Russian empire (Heikkinen, 2004b). In those days Finland was an agrarian country with few towns and poor transportation connections (Laukia, 2013). The earliest forms of vocational education originated in the 1830s when ‘Sunday schools’ were set up to teach urban industrial workers (Numminen, 2000). These schools, however, offered mainly general education in literacy, mathematics, and religion to apprentices and journeymen in 1840–1870 (Tiilikkala, 2011).

Finnish society started to rapidly change both societally and economically after the middle of the 1800s. An important change was that the work force was given the freedom to choose their living and work places as a result of new legislation passed in 1879. Especially people, who did not own any land, started to move from the countryside to the towns in their search for work. As an outcome of this development, the old guild system started to decline. Accordingly the vocational education system organised by the guilds was diminished and ruined (Laukia, 2013). Whereas in 1870 only 6% of the population was occupied in industry, this proportion increased to 15% by the year 1920 (Manninen, 1976, p. 81 according to Kontinen, 1993).

The vocational education provided by the guilds was also criticised. For example, the famous Finnish statesman Johan Wilhelm Snellman criticised traditional vocational education organised by the guilds and considered the quality of products too poor (Laukia, 2013). Vocational education was needed to provide students with good vocational skills because the existing formal education system concentrated only on the education of civil servants and civilized people. The need to change and reorganise vocational education became recognised as essential.

Institutional vocational education was initiated at the beginning of the 19<sup>th</sup> century. Schooling for seafaring started in 1813, and schooling for health care and midwifery in 1816 (Klemelä, 1999; Tiilikkala, 2011). The first business college was established in 1839, the first agricultural college in 1839, the first technical real colleges in 1847, and the first forestry college in 1861 (Laukia, 2013; Tiilikkala, 2011). The first schools for crafts and industry were established by the Board of Manufacturing on the basis of the ‘Act on the training of craftsmen and manufacturers for the country’ given in 1842 and the ‘Act on technical schools’ given in 1847 (Heikkinen, 2004b). The first vocational school was established in Helsinki in 1899.

Ideas, models, and influences for organising vocational education were sought from abroad, mainly from Germany, Austria, Switzerland, and the Netherlands (Laukia, 2013). The curriculum of vocational education included theoretical and vocationally oriented theoretical subjects and practical studies (Laukia, 2013). During 1900–1916 vocational schools were also established in other coastal cities besides Helsinki, including cities such as Pori, Porvoo, Kotka, and Viipuri (Laukia, 2013). The first inland vocational schools were established in 1912 and 1917 in Tampere and Kuopio (Laukia, 2013).

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The paradigms of VET started to expand in the late 19<sup>th</sup> century. In particular, Mikael Soininen (former Johnsson), who was an active Fennoman, the head of the Teacher Seminar, and an inspector and head of the Board of Education (Heikkinen, 2004b), promoted the Finnish cooperative movement and development of a folk school. Under his influence handicraft was included in the curriculum of the folk school (Laukia, 2013).

Folk education (comprehensive school) was organised in the 1860s only by the Lutheran Church, homes, and municipalities (Heikkinen, 2004b). The decree for folk schools in 1866 was an outcome of a wider Fennoman programme on folk enlightenment (Heikkinen, 2004b; Laukia, 2013; Rinne, 2013b). The Fennoman movement motivated some larger towns to start more systematic teaching of general subjects, home economics, and handicraft in continuation classes. In 1879 the ‘Act on liberation of trade’ obliged employers to release employees aged under 15 to attend school in the evenings (Heikkinen, 2004b). This meant in practice either attending continuation classes in the folk school or the school for crafts and industry. According to Heikkinen (2004b) education had two different aims. First, it was to provide all children with general education and education for citizenship, which was also a prerequisite for vocational education. Second, the Trade Act referred to school-based vocational education, which aimed at providing occupational knowledge and support for learning at work (Heikkinen, 2004b). Although the law for folk schools was launched in the 1860s, it was not until the end of the 1930s when all children had at least 4 years of basic education (Hyyrö, 2011; Laukia, 2013; Rinne, 2013a).

The promotion of the Finnish economy and industries and the provision of education occurred as parallel national projects in 1880–1910 (Heikkinen, 2004b). A great number of schools and institutes were established. The pioneer and inspector of VET in crafts and industry, Jalmari Kekkonen, suggested that continuation school should serve as preparation for apprenticeship schools for vanishing evening/part-time schools and their followers of crafts and industry (Heikkinen, 2004b; Laukia, 2013). He developed a curriculum of vocational education, which was influenced by the German reformist Kerschensteiner’s active school ideology that meant student-centred learning and workshops. It was thought that planning and making practical products motivated students more than bare school training (Heikkinen, 1995, 2004b). Vocational education and educated people were needed because new technologies, such as machines, railroads, and electricity, had been launched. In addition, offering education for students from different social classes was considered important.

Table 1 describes the estimation of the number of vocational institutions and students during the period 1840–1890.

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Table 1

*Estimation of the Numbers of Vocational Schools and Students in 1840–1890 (Adopted from Heikkinen, 2000)*

Schools	1840		1850–1860		1870–1880		1890	
	Schools	Students	Schools	Students	Schools	Students	Schools	Students
Agricultural schools	1		1	30	8	200	14	362
Forestry schools					1	10	14	362
Animal husbandry schools							2	8
Dairy school			2	30	20	185		
Horticultural schools	1		1	15	1	15	5	30
Home economics schools							10	100
Business schools	1	50	1	50	2	120	7	450
Seafaring institutions – Handicraft schools	3	90	3	90	6	150	7	156
Vocational schools	15	700	23	1900	32	2500	35	1286
Technical schools			3	70	5	625	7	689
Nursing schools							1	9

### 1910–1940: Establishment of distinctive VET

The historical period that Finland was a Grand Duchy as part of the Russian Empire was finished when Finland achieved national independence in 1917. The declaration of independence was soon followed by the 1918 civil war. The civil war was more or less disruptive for schooling (Laukia, 2013). As an outcome of the civil war, the contrasts between the urban and rural areas, their life forms, and industries became visible, and in society, the popular movements started to split into communist, social democratic, and agrarian parties, with confrontations between workers and employers moving to the national level (Heikkinen, 2004b). As a result of the conflict's effects, industrial relations moved from the Soviet Union towards Western Europe and the USA, and domestication started by promoting rural inhabitancy and agriculture. The proponents of different fields of occupations

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competed about the establishment of schools for technical, agricultural (including home economics and industry), business, and health care education (Heikkinen, 2001).

The Act on universal obligation to attend folk school came into effect in 1921. The Act stated the obligation to attend continuation school for 2 years after compulsory schooling (Heikkinen, 2004b). Between the 1920s and 1940s there were repeated initiatives by the Ministry and Board of Education and Teacher Seminars that aimed to develop continuation school into practically oriented general vocational education (Heikkinen, 2004b). A proponent of the continuation school during 1926–1963, Folk school inspector Alfred Salmela, saw it as part of folk education. The mission of the continuation school was in the first place, education for citizenship, second, to give occupational guidance, and third, to provide practical and occupation-oriented education (Kailanpää, 1962, see Heikkinen, 2004b).

In 1943, the continuation school became obligatory for applicants for other schools. In the following reform in 1958, this form of schooling was renamed the School for Citizenship (*kansalaiskoulu*). The popularity of grammar school (middle school and gymnasium) exploded, and vocational schools expanded and gained national recognition in the modernizing of Finnish VET. Folk school reform and the reform of a system of school-based VET were integrated in the project of developing Finland towards a welfare state, Welfare Finland (Heikkinen, 2004b). Although the aim of the folk school was to educate good citizens not skilled workers, competition between the students of the folk school and vocational schools lasted until the end of the 1950s (Halila, 1963; Jauhainen, 2002; Laukia, 2013).

In the 1920s and 1930s, the number of vocational schools and students increased slowly because Finland was an agrarian country and towns were not interested in establishing new vocational schools. Vocational schools were operating, but there was a lack of financial support by the state. Therefore, big companies, like Wärtsilä, Kymi, and Yhtyneet Paperitehtaat, established their own schools. These schools operated under the Department of Trade and Industry (*Yksityisteollisuuden ammattikoulut*) (Laukia, 2013).

During the Second World War 1939–1944, Finland fought against the Soviet Union. In spite of the war, schools operated most of the time. When they were closed they served as military hospitals, and the pedagogy adopted for schooling was that of distant learning (Laukia, 2013).

Some central characteristics of vocational education during the pre-Second World War period have been described by Heikkinen (2004b) as follows:

- Establishment of a distinctive VET system promoting national industries, networks between administration, industry, schools, and civil society;
- Combination of community and occupational citizenship in work and VET; and
- Defence of vocational schools against vocationally oriented continuation school; VET as a specific form of education.

## THE POST-WAR CHALLENGES

### Post-war development in the 1940s–1960s

After the Second World War, a patriotic consensus and political alliance was created between industry, the Finnish-speaking state bureaucracy, and the modern socio-democratic labour movement (Heikkinen, 2001). The industrial point of view had been strengthened and rural life was in demand to be modernized. Accordingly, there was a need to provide rural youngsters with alternatives for grammar schools and teachers. The importance of vocational education as a distinctive form of education was crystallised by its major proponent Aarno Niini, who acted as the head of the Department of Vocational Education in the Ministry of Trade and Industry during the 1940s–1960s (Heikkinen, 2001).

After the Second World War, there was a demand for skilled workers in the labour market in Finland because only 5% of industrial workers had gained job training (Tuomisto, 1986). Furthermore, the task of industry was to produce the goods necessary to pay the substantial war reparations demanded from Finland (Kivinen & Peltomäki, 1999). The first central state-owned vocational schools were founded in the 1940s (Kivinen & Peltomäki, 1999). After the war the vocational institutes were small and recruited mainly young people from rural areas. New vocational schools were established in a limited number (see Table A1, Appendices). The new law for vocational education was not launched until 1958. Thereafter, vocational education expanded geographically and differentiated into occupational branches and fields in the 1960s and 1970s (see Tables A1 and A2, Appendices) (Heikkinen, 2001; Laukia 2013).

The new law (1958) for vocational education meant that all municipalities of more than 20,000 inhabitants had to have a vocational school and smaller municipalities had to reserve study places for their youngsters at these schools (Laukia, 2013). In addition, a baby boom after the Second World War increased the number of young people. The change in the dominant forms of production was more rapid in Finland than in the other European countries. In 1950, some 46% of the labour force earned their living in agriculture, whereas in 1970, the proportion was 20%. In those days the amount of industry, trade, and public services increased, and urbanization started as people moved from the countryside to the cities (Laukia, 2013).

Vocational education and training were differentiated by the study field until the 1970s (Heikkinen, 2001). The period after the 1960s was defined by rapid construction of a modern, industrialised, urban Finland. It was a period where identifying with Nordic social democracy and American ways of life characterized societal development (Heikkinen, 2001). Heavy industry (metal because of the reconstruction and war payments) dominated, but also new mass production in the textile, clothing, leather, shoe, and food industries emerged. Their development was strengthened by Soviet trade. At the same time, small farming decreased dramatically; thus, people were forced to move to urban centres and abroad, for example to Sweden. People adopted new suburbanized styles of housing and living, and the traditional

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skills seemed to have little value. New services and social welfare started to replace the traditional collective responsibilities (Heikkinen, 2001).

In addition, the administration of vocational education and training was dispersed under several ministries and central administrative boards until the 1960s. In 1966, the Finnish National Board of Vocational Education was established as part of the Ministry of Trade and Industry, and in 1968 the Board was transferred to the Ministry of Education. Finally in 1991, the general (the Finnish National Board of General Education) and vocational (the Vocational Board of Education) boards were merged to form the current the Finnish National Board of Education (FNBE) (Cedefop ReferNet Finland, 2011).

### **Summary of the development of Finnish VET and industry and nation formation**

According to Heikkinen (2001), nation building, industry, and vocational education promoted the emergence of three competing paradigms of vocational education at the beginning of the 19<sup>th</sup> century. The technocratic paradigm was linked to the project of 'Industrial Finland', the nationalist paradigm to the project of 'Farmers' Finland', and the paradigm of collective care was developed in connection to the project of 'Welfare Finland' (see Table 2). The paradigms competed with and completed each other. A crucial phase was the Russian oppression around the turn of the 20<sup>th</sup> century, which was decisive for the commitment of the state to support industrial and technological development and vocational education (Heikkinen, 2001).

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Table 2

*Vocational Education as the Co-constitutor of Finnish Projects of Industry and Nation Formation (Heikkinen, 2001)*

Project of Finland institutions	Projects of 'industry'	More specific ↔	VET
<p><i>1 a Industrial Finland</i></p> <p>dominating</p> <p>↓</p>	<p>Wood-processing industry</p> <p>Metal industry</p>	<p>Timber industry and paper and pulp</p> <p>Mining &amp; basic metal</p> <p>Machine industry</p> <p>Ship building</p> <p>Precision mechanics</p> <p>Concrete-element</p>	<p>Technical schools colleges, Sunday → vocational schools, branch-specific schools, commercial maritime schools</p>
	<p>Construction industry</p> <p>Textile-clothing-shoe industry</p> <p>Nutrition industry</p>	<p>Dairying</p> <p>Brewing</p> <p>Baking</p> <p>Foodstuffs</p>	
	<p>Transport and communication</p> <p>Business</p> <p>Hotel &amp; catering</p>	<p>Retail, banking</p>	
<p><i>1 b Crafts/small enterprise Finland</i></p> <p>craft → subcontracting</p>	<p><i>2 b Home Industry Finland</i></p> <p>→ self-supportiveness</p> <p>↑</p> <p>dominating</p>	<p>Metal, wood work</p> <p>Construction</p> <p>Textile-clothing-shoes</p> <p>Nutrition</p>	<p>Apprenticeships, Schools for home industry</p>
<p><i>2 a Agrarian-small farmers Finland</i></p> <p>multiplicity → self-supportiveness → subcontracting</p>	<p>Animal husbandry</p> <p>Fibre growing</p> <p>Farming</p>	<p>→ Meat,</p> <p>→ Weaving &amp; clothing</p> <p>→ Brewing, baking, dairying industry</p> <p>Home and institutional services</p> <p>→ Carpentry</p>	<p>Schools for farming animal husbandry, dairying, forestry, Schools for home economics</p>
	<p>Forestry</p>		
<p><i>3 a Welfare-Finland</i></p>	<p>Agrarian collectivism and care ↔</p> <p>Workers in export industry and traditional crafts</p>	<p>Agrarian Finland</p>	<p>Nurse apprenticeships → nursing</p>
	<p>Landless, urban poor, lumberjack farmers ↔</p> <p>Women</p> <p>↔</p>	<p>↔ Industrial Finland</p>	
		<p>Small farmers/ Industrial Finland</p>	<p>Schools for caretakers &amp; social service</p>
<p>A distinctive project?</p>		<p>Bourgeois suffrage/ working class emancipation</p>	
<p><i>3 b Civil servant/ technocratic Finland</i></p>	<p>Military-gentry-clergy ↔</p> <p>→ nation-building intelligentsia</p> <p>→ state-building Finnish-speaking administrative networks</p> <p>→ technocracy: bureaucrats and welfare servants</p>	<p>Mediating other projects</p>	<p>Military schools, universities, civic colleges, commercial schools</p>

## **VET CHALLENGED BY THE QUEST FOR EQUAL OPPORTUNITIES AND THE UNIFICATION OF EDUCATIONAL TRACKS (LATE 1960S–1990S)**

### **1970–1980: Comprehensive school reform and upper secondary school reform**

In the 1960s and 1970s the Finnish Parliament decided that the parallel type of education system had to be replaced by a common basic education (Antikainen, 2007; Laukia, 2013; Niemi, 2012).

Finnish comprehensive school reform was implemented during the years 1972–1977. The main objective of the reform was to offer the whole age group 9 years of compulsory schooling. At the same time, 8 years of folk school and 5 years of middle school disappeared and 9 years of basic education was established. This was followed by a reform of upper secondary vocational education (e.g., Rinne, 2013a). The comprehensive school reform also had a substantial significance for vocational education and training (Numminen, 2000); it improved the knowledge and skills of those entering VET and postponed the choice of the educational track.

Vocational and general upper secondary education developed separately at that time, but links between the two tracks were created later (Numminen, 2000). The national policy of vocational education was to broaden the scope of the VET provision, to raise national standards, and to meet the needs of working life. According to Numminen (2000), in the 1970s the development of VET displayed twofold tensions. On the one hand, there had been efforts for the enhancement of the relationship between vocational and general education, and on the other hand there were tensions within the vocational sector between the different fields (Numminen, 2000).

Finnish upper secondary education reform in the 1980s was carried out on several different levels: administration, schools, teachers, and students. The reform was put into practice by the Finnish National Board of Education and by the Ministry of Education. Schools planned and implemented their curricula at the local level by themselves (Lasonen & Stenström, 1995). This was followed by a reform of upper secondary vocational education. The aim of reform that took place at the end of the 1970s was to consolidate Finnish vocational education. The curriculum reform also unified vocational curricula into a smaller number of basic programmes resulting in a system with 25 basic programmes and 250 specialisation lines.

The purpose of the reform was, among other things, to make students more equal by allowing them to enter vocational education and choose their vocational field before choosing the level (school or college level) of their studies. It was planned that they would choose their study level on the basis of their achievement during the first-year period and that social background would no longer influence their choices. The first year was common and provided general subjects. The proportion of general (academic) studies in the vocational curricula increased to

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vary between the fifth or the fourth of the given programme's total duration (Numminen, 2000).

The reform of vocational upper secondary education 1982–1988 can be summarised to the following changes (Numminen, 2000):

- VET was integrated into 25 basic programmes, which were further divided into about 250 parallel upper secondary and postsecondary specialisation lines. The upper secondary programmes led to blue-collar tasks, the postsecondary programmes to supervisory and planning duties.
- Upper secondary and postsecondary programmes started with a common year, the basic period.
- The general education component of VET was considerably expanded with a view of broadening its scope and opening up routes to further and higher education.
- A route to higher education was created through postsecondary education.
- The volume of the educational provision in the different study fields was proportioned to the demand for labour and the size of the age group.

Some of the expectations of the reform failed to materialise. This system did not particularly succeed in promoting equality and removing the influence that social background had in participation in education (Stenström, 1981, 1991, 1997). The reasons were, for example, that students did not choose their study field before their level of studies, the pedagogy of the basic period was not developing as expected, and working life was changing more rapidly than had been anticipated (Numminen, 2000).

In the 1980s the signs of recession were visible in the new fields of production, such as the textile, clothing, and shoe industries, but the economic situation and the implementation of former progressive programmes improved the status of vocational education (Heikkinen, 2001).

## **VET CHALLENGED BY DECENTRALISATION AND DEREGULATION (1990S TO THE PRESENT)**

### **1990s: Reforms of VET and experimental projects**

The rapid collapse of the banking system and the fall of Soviet trade changed the social and economic situation quickly in the 1990s in Finland (Heikkinen, 2001). In 1995 Finland joined the European Union. Before this, the school system had started to experiment and to reform both in upper secondary and higher education.

At the end of the 1970s, the number of upper secondary school leavers remained high but the number of study places remained low (Stenström, 1981). In addition, 20% of those who entered

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universities had gained qualifications from both general upper secondary school (including the Matriculation Examination) and upper secondary vocational school. This multiple education was one reason for the emergence of polytechnics in Finland (Numminen, 2000).

In the 1990s there were two major educational experimental projects, namely the youth education pilot project and the polytechnics (universities of applied sciences (UAS)) reform 1992–2002. The central features of the youth education pilot project were as follows (Numminen, 2000):

- local and/or regional co-operation between general upper secondary schools and vocational education schools on the special issue of the interrelationship between academic and vocational education;
- increasing a range of options available in the curricula; and
- giving students an opportunity to combine studies provided by a number of different educational institutions into a personal study programme.

The youth education pilot project did not become a model practiced in the whole of the country (see Meriläinen, 2011). In 2005–2006, altogether 63% of vocational institutions and 83% of general upper secondary schools reported that they were collaborating. They had formed altogether 102 collaborative networks. The number of students who had completed both the vocational upper secondary qualification and the matriculation examination was around 5% (Mäensivu et al., 2007). The opportunity to complete the double qualification (matriculation examination and vocational qualification combined) has been more common in some of the larger cities, for example in Helsinki, Jyväskylä, Tampere, and Rovaniemi.

The polytechnics, which were also started through an experimental phase, received a permanent position later in the 1990s. The reform was carried out by the Ministry of Education and involved the experimental provision of tertiary vocational education in polytechnics. At the time of the establishment of the polytechnics, the objective of the educational policy was that about 65% of each age group would complete a tertiary degree (Ahola, 1997; Lampinen, 1998). The Finnish polytechnics were developed from former vocational colleges and higher vocational education institutions. By 2000 all polytechnics were working on a permanent basis. By this removal of the so-called institute (college) level, the VET system was divided into two levels: basic ‘school level’ VET and ‘higher level’ VET (Heikkinen, 1997).

Efforts to develop initial VET as such had been introduced before the youth education experiment. During the period 1989–1997, there was an internal experiment in VET, namely ‘The Flexible Qualification Structure’ (Numminen, 2000). Its aims were as follows (Numminen, 2000):

- to broaden the scope of VET to diversify it through curricular means by directing students to several fields, such as mechanical and metal engineering or electronic and motor vehicle engineering;
- to improve students’ capabilities for further and higher studies; and

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- to create a route to further and higher studies in technical education in the context of an experiment conducted in the field of technical education.

The 1990s was a busy time to develop the Finnish VET. Reform of the structure of the qualifications was implemented in 1995, and reform of the curricula of VET in 1998–2001 (Numminen, 2000). These reforms brought about the following changes:

- creating a consecutive structure of educational provision involving the gradual abolition of the postsecondary level through the permanent establishment of polytechnics;
- dismantling the basic programme structure, which was replaced by about 70 initial vocational qualifications;
- extending (or harmonising) the duration of all vocational study programmes to 120 credits (study weeks);
- incorporating into all study programmes at least a 6-month on-the-job training period;
- consolidating apprenticeship training; and
- introducing vocational skills demonstrations (competence tests) (Numminen, 2000).

In the 1990s the curricula of vocational education were renewed; it was designed to be of equal length, 3 years, and across all sectors. On-the-job learning was included in the curricula. Until 1995, students were offered three levels of vocational qualifications: school-level (2–3 years), college-level (2–4.5 years), and higher vocational qualifications (3–4.5 years). In 1995 the division of vocational education into 26 programmes and more than 200 specialisation lines was abolished. Vocational education was reorganised into study programmes based on occupational sectors and fields. After the curriculum reform in 1995, Finnish VET provided 77 basic vocational qualifications taking 2–3 years to achieve. The aim of the reform was to simplify the system, reduce multiple qualifications and increase the range of flexible options available for students.

Before the upper secondary education reform, there were no routes from vocational education to higher education (Numminen, 2000). In the late 1990s the upper secondary (initial) vocational education was reformed so that a 3-year qualification gives its holder general eligibility to higher education (Cedefop ReferNet Finland, 2011; Numminen, 2000).

## THE CURRENT SITUATION

### **Enhancing links between VET and working life**

In Finland prior to the turn of the millennium, initial (upper secondary) vocational education was mainly organised by vocational schools with few links between education and working life. Since 2001, one of the central reforms undertaken in Finnish VET has been the incorporation of on-the-job learning (work-related learning) into the curriculum. The minimum overall length of this component is 6 months (20 credits) in the whole of an initial

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vocational 3-year-qualification (120 credits). On-the-job learning is guided and goal-oriented study at the workplace. According to the recommendations for its organisation, on-the-job-learning does not demand a contract between an employer and a student and students do not get paid for duties completed during the on-the-job-learning period (Ministry of Education, 2005; Tynjälä et al., 2006). On some occasions providers of education pay employers a small recompensation in exchange for guidance given to students (Ministry of Education, 2005; Tynjälä et al., 2006).

This new approach has meant a radical change in attitudes and forms of organising VET both for the institutes and the workplaces (Numminen, 2000). The social partners have had to agree with the provision of company-based on-the-job training. The implementation of new on-the-job training periods in vocational curriculum has demanded the provision of supplementary education for the vocational teachers and workplace instructors (Numminen, 2000). Furthermore, local organisation of on-the-job-learning periods has involved making agreements between employers and vocational education institutions regarding the share of duties between participants, organisation of student guidance, and student assessments as well as possible reimbursements to the employer (Tynjälä, Virtanen, & Valkonen, 2005). In addition, employers and educational institutions must have agreed on the aims and essential contents of on-the-job-learning together with its length and timing (Tynjälä et al., 2005).

On the whole, the new workplace learning system in Finnish VET has been received very positively. Since the system has been introduced, there has been a persistent declining trend in the numbers of dropouts from initial VET (Virtanen, 2013). Whereas 13% dropped out from initial VET in 2000/2001, the number of dropouts from initial VET was 9% in 2011/2012 (Tilastokeskus, 2014). This trend is different from the trends of dropping out in other forms of education in Finland because it is somewhat stronger. In university education dropping out has mildly increased from 4% to 6% during the same years (Tilastokeskus, 2014).

Studies have shown that vocational students have been motivated to learn ‘real work’ during their workplace learning periods. In particular, students have felt that they have learnt independency and initiative taking and have become more self-confident (Virtanen, 2013). With respect to adopting professional, learning, collaboration, and self-assessment skills, they consider themselves as having developed as professional agents more generally (Virtanen, 2013). Despite the general positive development on the system level, the learning environments of the different vocational fields seem to differ significantly from each other in this respect and they offer students different settings for on-the-job-learning (Anttila et al., 2010; Virtanen, 2013). This has been prevalent, for example, in comparisons of the field of social services and health care and the field of technology and transport. Depending on the learning environment provided by the workplace, students from the field of technology and transport may have to adopt a more active role in order to receive better learning outcomes than students from the field of social services and health care (Virtanen, Tynjälä, & Eteläpelto, 2014). The long traditions of organising guidance for students in the field of social services and health care have supported the advent of a strong model of on-the-job-learning. Other educational fields might benefit from benchmarking it (Virtanen, 2013.) Teachers have

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considered the task of finding workplaces and their variance challenging in the organisation of on-the-job-learning (Peltomäki & Silvennoinen 2003; Tynjälä et al., 2005; Virtanen & Collin, 2007).

Efforts to achieve closer cooperation between VET and the workplace have also included adoption of a new form of assessment, which has become known as vocational skills demonstration (Stenström, 2009). This means that at different points during their training in initial VET, students demonstrate the skills they have learned in tests arranged as either practical work situations or as practical assignments. These skills demonstrations assess how well the student has achieved the competencies needed in the labour market. Skills demonstrations also bring together workplace representatives and teachers (Räkköläinen, 2011; Stenström, Laine, & Kurvonen, 2006). Their organisation has affected and enhanced the models of organising on-the-job-learning not only by effecting the timing, contents, guidance, and student assessment but also through demanding new forms of learning agreements and documentation. Their adoption has thus also increased the demands for administration (Anttila et al., 2010).

### **Vocational qualifications in the 2000s**

According to present national regulations, initial vocational education and training (IVET) is built on the basic education syllabus. Vocational qualifications consist of 120 credits (including 90 credits of vocational subjects, 20 credits of general core subjects, and 10 credits of elective studies) and takes 3 years to complete (Finnish National Board of Education, 2010). The current vocational qualification system has been developed from previously established vocational qualifications (Ahola & Anttila, 2013). Qualifications can be achieved via three different routes (see Table 3). The majority of young learners complete their upper secondary vocational qualifications at vocational institutions. Vocational qualifications may also be completed through apprenticeship training; most apprentices are adults. Furthermore, upper secondary vocational qualifications may be obtained through competence-based examination (completed by adults) independent of how the vocational skills have been acquired (Cedefop ReferNet Finland, 2012).

Students apply for VET through a national joint application system. The entry requirement to vocational upper secondary education is a leaving certificate from the comprehensive school (basic education) or an equivalent amount of studies (Laki ammatillisesta koulutuksesta (630/1998), 1998; Ministry of Education and Culture, 2012c).

Adult education is provided at all levels of education. Adults can study for vocational qualifications and further and specialist qualifications or study in further and continuing education without aiming at a qualification. The qualification requirements in adult education are the same as for vocational upper secondary education and training (Stenström, Väisänen, Rossinen, Tuominen, & Laakkonen, 2013). Qualifications in vocational adult education and training are carried out as competence-based qualifications and thus enable working-age

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adults to gain qualifications without necessarily attending formal training. However, most candidates have taken part in some preparatory training. In competence-based examinations, adults demonstrate their vocational skills regardless of where or how the skills have been acquired (Finnish National Board of Education, 2010).

At present there are altogether 119 study programmes leading to 53 different vocational qualifications (Ministry of Education and Culture, 2014; cf. Eurypedia, 2014). The fields of VET are as follows (Finnish National Board of Education, 2010):

- Humanities and education;
- Culture;
- Social science, business and administration;
- Natural sciences;
- Technology, communication, and transport;
- Natural resources and the environment;
- Social services, health, and sport; and
- Tourism, catering, and domestic services.

Table 3

*Number of VET Students by Type of Education in 2007 and 2010 (Adopted from Cedefop ReferNet Finland, 2012, p. 15)*

	2007	2010	Proportion as a % of all VET students in 2010
<b>Upper secondary VET</b>			
Upper secondary vocational qualification	126,025	133,690	49.9
<b>Competence-based qualifications</b>			
Upper secondary vocational qualification	28,041	36,931	13.8
Further vocational qualification	30,081	31,664	11.8
Specialist vocational qualification	6,846	6,541	2.4
<b>Apprenticeship training</b>			
Upper secondary vocational qualification	27,169	22,797	8.5
Further vocational qualification	20,503	19,633	7.3
Specialist vocational qualification	14,841	16,461	6.1
<b>Total</b>	<b>253,524</b>	<b>267,717</b>	<b>100.0</b>
Women %	50.2	50.6	
Special needs education	6.1	7.2	
Mother tongue other than Finnish or Swedish	4.2	5.0	

### **Institutions and stakeholders**

The Ministry of Education and Culture is the highest education authority in Finland. It supervises publicly subsidised education and training provision (from primary and secondary general education and vocational training to polytechnic, university, and adult education). The Ministry of Education and Culture and the Finnish National Board of Education are responsible for implementing national education policies (Ministry of Education and Culture, 2012a). National qualification requirements are drawn up by the Finnish National Board of Education in cooperation with employers' organisations, trade unions, the Trade Union of Education, and student unions (Finnish National Board of Education, 2014). They are dealt with by National Education and Training Committees, which are tripartite bodies established for each occupational field by the Ministry of Education and Culture for a term of 3 years at a time to plan and develop vocational education and training. Qualification requirements for upper secondary vocational qualifications and requirements for competence-based qualifications are the same for young and adult students (Stenström et al., 2013).

The education providers decide matters within this statutory framework. VET providers are responsible for organising training in their areas, for matching provision with local labour market needs, and for devising curricula based on the core curricula and requirements (Stenström et al., 2013). They also decide independently what kind of institutions or units they run.

A VET provider may be a local authority, a municipal training consortium, a foundation or other registered association, or a state company (Ministry of Education and Culture, 2012b). There are around 210 VET providers in Finland. The majority of vocational institutions (usually VET institutions) are maintained by local authorities, joint municipal authorities, and the state. Approximately 40% of their total number is maintained by private organisations, but only 20% of students study in institutions maintained by private organisations. Funding criteria are uniform irrespective of ownership (Cedefop ReferNet Finland, 2011).

The education providers are the so-called competent bodies when it comes to curriculum-based vocational qualifications. Accordingly, certificates are awarded by the education provider. Students are awarded a qualification certificate (tutkintotodistus/examensbetyg) upon the completion of all the studies required for the qualification.

Act on Vocational Education and Training (Laki ammatillisesta koulutuksesta (630/1998) contains the provision of a student's right to make individual choices in his/her studies. The Vocational Education and Training Decree (Asetus ammatillisesta koulutuksesta 811/1998) contains the provision of how to inform students of the training offered, of student counselling, and recognition and validation of prior skills. In order to ensure a student's right to make individual choices, the education provider must prepare for the student an individual study plan based on his/her individual starting point and update it throughout the training provided.

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Recognition of prior learning is regulated by the Act and Decree on vocational education and training (1.1.2006). Recognition is based on learning outcomes, not on learning time. The VET provider decides on the recognition and assessment (validation) of prior learning.

### **Status of the current VET**

A crucial aspect of Finnish working life and vocational education has been the importance and the extent of women's work and education (Heikkinen, 2001). Household and home industry was conceived as parts of rural work in Finland; later they were developed as distinctive educational occupations (Heikkinen, 2004b). Nursing and social work have provided important inputs to Finnish conceptions of work and occupation. The female-dominated occupations and VET have developed in parallel with the male-dominated ones. Despite women's high level of participation in education, the segregation of educational fields according to gender has remained high in Finland. The decrease in segregation has been lowest in vocational upper secondary education (Kuusi, Jakku-Sihvonen, & Koramo, 2009).

The position of vocational education in the Finnish school system has changed in recent years. The popularity of vocational education and training has increased since the early 2000s. The year 2009 was the first year when the majority of applicants listed a VET programme as their primary choice (Cedefop ReferNet Finland, 2011, p. 27). While interest in vocational education has increased, after basic education one half of youth continued in general upper secondary schools and 42% in IVET in 2012 (Statistics Finland 2014). Correspondingly, in 1992 52% of students completing the comprehensive school immediately continued in general upper secondary schools and 32% in IVET (Lasonen & Stenström 1995; Statistics Finland, 1994).

The following facts may explain the VET's increased parity of esteem with respect to general upper secondary education: 1) upper secondary vocational education and training has been developed more clearly towards the world of work during the last decade; 2) there have been several campaigns organised by the Ministry of Education and Culture and social partners to improve the image of vocational education; 3) Skills competitions, like the annual Finnish National Skills Competition 'Taitaja', have also increased the popularity of VET (Cedefop ReferNet Finland, 2011); and 4) eligibility to higher education. One factor that has strengthened the status of vocational education is the establishment of universities of applied sciences in the 1990s. They offer a possible and systematic route to continue the vocational graduates' studies in higher education.

### **Transitions from VET to the labour market and higher education**

The principle of initial vocational education and training is to provide solid vocational knowledge and skills, which enable students to move rapidly to a working life, as well as broad-based knowledge and skills for lifelong learning (Ministry of Education and Culture, 2012a). Vocational education and training is expected to prepare students for an unknown future based on current knowledge (Nilsson & Nyström, 2013). Nowadays, being employable is often associated with being a generally knowledgeable and educated person who is able to adapt easily and learn specific procedures (Bowden & Marton, 2004). Therefore, the focus of many vocational education programmes seems to shift towards a generalist competence (Nilsson, 2010).

Transitions from youth to adulthood and from studies to work have changed (Raffe, 2008; Thomson, Bell, Holland, Henderson, McGrellis, & Sharpe, 2002). Today, transitions involve movement back and forth, and individual educational paths may lead to many different directions before establishing a more permanent position in the labour market. In the course of an individual's life in post-modern society, the transitions can be characterised by individualisation, inconsistency, prolongation, and fragmentation (Walther, 2006). Youth transitions have been not only prolonged but also de-standardised. According to Walther (2006), this process is related to such factors as extended periods in education, labour market flexibility, and the trend of individualisation. These characteristics have been referred to using the metaphorical term of yo-yo transitions (Walther, 2009).

In recent years, Finnish education policy has paid much attention to the transition points between educational levels. Almost all young people finishing comprehensive school have access either to general upper secondary education or to upper secondary vocational education and training (Cedefop ReferNet Finland, 2012). According to annual statistics for post-compulsory education in Finland, nearly all comprehensive school graduates apply for further studies as only 2% do not do so. At the same time, respective admission statistics show that a total of 91% go on for further studies aimed at a qualification or degree after the comprehensive school (Myrskylä, 2011). However, the proportion of untrained young people is higher than these figures would suggest because of dropping out from upper secondary education. During the academic year 2010/2011, a total of 4% of students attending a qualification or degree programme discontinued their studies and did not resume them in any other education leading to a qualification or degree (Statistics Finland, 2013a).

According to Statistics Finland (2013b), the majority of recent vocational graduates found employment more easily in 2011 than a year earlier. The majority (72%) of those completing an upper secondary vocational qualification (school-based programmes) in 2010 had found employment 1 year after their graduation, while 12% were unemployed. Another 7% were full-time students, and 9% fell into the group 'others' (those involved in military or non-military service, homemakers, or pensioners) (Statistics Finland, 2013b). During the past 10 years the employment of graduates has improved or remained unchanged despite the general weakening of employment in 2009 (Statistics Finland, 2013b).

A 5-year follow-up study indicated that 68% of students who had started in vocational education in 2004 and graduated by 2009 were employed. Among the rest of these 2004 entrants, 16% were unemployed, 10% were full-time students, and 5% fell into the group ‘others’ at the end of 2009 (Stenström, Virolainen, Vuorinen-Lampila, & Valkonen, 2012). There are big differences between study fields, however. The highest employment rates were found for social services, health, and sport graduates, of whom only 6% were unemployed, whereas about 22% of the technology, communication, and transport graduates were unemployed. These study fields are also gender segregated so that the former is female dominated while the latter is a male-dominated field. In addition, there are also field-specific differences between the graduates’ socioeconomic and occupational status. Over half (66%) of the social services, health, and sport graduates were employed as lower-ranking clerical workers (white-collar jobs), whereas half of the technology, communication, and transport graduates were blue-collar workers. One factor influencing the graduates’ socioeconomic status seems to be their previous educational background. Those who had completed more than one qualification before their latest VET programme were employed in white-collar jobs more typically (47%) than their peers with no prior qualification (21%). Many studies (Livingstone, 2010; Nilsson & Nyström, 2013; Tomlinson, 2008) have indicated an inflation of formal educational requirements. This rapid expansion of education has led to underemployment and an opportunity trap (Brown, 2003).

This kind of educational inflation is seen among the VET students as more than a quarter of them had multiple qualifications (Stenström et al., 2012), which is related both to individual (so-called wrong choices) and to societal factors (e.g., the change and disappearance of current jobs and occupations).

### **Dropouts in VET**

Despite the increased popularity of vocational institutes and the fact that dropping out has diminished during the first decade of the 21st century, vocational schools still have the greatest dropout rates in upper secondary education in Finland (Rinne & Järvinen, 2011). Now, dropout rates in VET seem to be increasing again; in 2011 it was 9% (Statistics Finland, 2013a). Dropping out is highest in VET as compared to the other educational levels and sectors (general upper secondary education 4.0%, UAS 8.6%, and universities 5.9%). The picture is also different, if we look at the discontinuation of the starting cohort. Of the students starting in vocational education in 2004, almost a quarter (23%) discontinued their studies in 2004–2009, as revealed by a recent study (Stenström et al., 2012). The study involved a follow-up of a starting cohort throughout the span of their VET programme, and the resulting figures are in line with the general dropout rate of the starting cohort of VET students (Statistics Finland, 2012).

The results indicate that a primary factor connected to graduation or dropping out was a student’s starting age. The older the students were when starting, the more likely they

discontinued their studies. The background factors had different connections to graduation for different age groups. The youngest were more likely to complete their studies, especially when compared to the older ones with prior education higher than just the compulsory school. In other age groups also, previous education had a connection to the completion of the VET programme (Stenström et al, 2012). These results are consistent with earlier research findings (Mehtäläinen, 2001).

Besides age, dropping out has been connected with gender. One of the current debates concerns male students becoming excluded from society as labour market requirements increase. Therefore, completion rates in vocational education and training are monitored closely (Cedefop ReferNet Finland, 2011). Dropping out was more typical for male students than for their female peers in all age groups. Also, previous education showed a connection to dropping out; those having a vocational qualification before pursuing another one ended up discontinuing their studies more often than others. Dropping out also seems to be connected with employment. Compared to the graduated students, the dropouts were more often unemployed 5 years after the start of their studies (Stenström et al. 2012, p. 58). In society where the significance of education and qualifications is highlighted, young people without such attainments have less choice of available jobs so that they often end up with low paying jobs with little educational demands and poor prospects for career advancement (Christle, Jolivette, & Nelson, 2007).

During the last few decades, there have been attempts to reduce young people's dropping out of education as well as interruption of vocational schooling, for example, by increasing career guidance and individual counselling both in basic and upper secondary education and by paying special attention to the teaching and learning of certain 'risk-groups' of young people. A similar kind of special education that has been available in basic education for decades has now been introduced in vocational education and training as well (Rinne & Järvinen, 2011; Vanttaja & Rinne, 2008, 45).

### **Current challenges and innovations**

Although the attraction of vocational education and training has been steadily growing, there are some challenges to developing Finnish vocational education and training. On one hand dropping out creates a challenge. On the other hand, the increased popularity of VET with the changing working life and competence requirements creates new demands on VET (Laukia, 2013). There is a need to develop the VET system to be more responsive to a heterogeneous student population, to meet the needs of those aiming to participate in Skills competitions (Ruohotie, Nokelainen, & Korpelainen, 2008), and those at risk of dropping out (e.g., Kuronen, 2010).

Dropping out is reflected in a slower transition to employment, a possible decrease in educational attainment, and a general experience of failure for young people; consequently,

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there is the risk of exclusion (Komonen, 2012; Stenström et al., 2012). Dropout rates have been decreasing since the beginning of the 21st century, but the absolute number of dropouts has not fallen much, nor has the number of students who gain their qualifications in the target time been growing as desired (Ministry of Education and Culture, 2012c). Among the students who started in vocational education in 2004, almost a quarter (23%) discontinued their studies at some point in 2004–2009. Because this figure is based on a follow-up of the starting cohort throughout the span of their VET programmes, the overall dropout rate clearly exceeds the annual rate (Statistics Finland, 2012). During the academic year 2010/2011, a total of 9% of students attending a VET qualification programme discontinued their studies and did not resume them in any other education leading to a qualification or degree (Statistics Finland, 2012).

Study results considering interschool reasons for dropping out have underlined the meaning of well-being and how it affects schools' general atmosphere. It has been noted that teachers' motivation affects the quality of education and interaction with students and vice versa. Heterogeneous student groups create a challenge for organising education as such (Rantanen & Vehviläinen, 2007). Youth has also become more demanding with respect to education, while the post-Second World War period has been reflected in the welfare states' shift from a generation of limited educational resources (the generation born before 1935) to a generation of multiple opportunities and welfare (the generation born post-1956 [Kauppila, 2013]).

In order to tackle the exclusion of young people, the Finnish Youth Guarantee was launched in the beginning of 2013 (Ministry of Education and Culture, 2013). This guarantee will offer everyone under the age of 25 as well as recent graduates under the age of 30 a job, on-the-job training, a study place, or rehabilitation within 3 months of becoming unemployed. Its intention is to prevent young people from being excluded from society.

In addition, the instrument of preparatory instruction has been developed to lower the threshold to education and training and to reduce dropping out. The aim of this instruction is to improve students' capacities to obtain a place in vocational education and training. Such instruction takes 6 months between basic education and vocational education and training (Cedefop ReferNet Finland, 2012). In addition, so-called youth workshops offer training and work experience placements to unemployed young people under 29 years of age. They offer a place for young people to learn life skills, grow into adulthood, and get hands-on work experience, encouraging and helping them to seek further training.

In order to respond to the requirements of the changing world of work, the flexibility of vocational qualifications has been further increased, for example, diversifying opportunities to include modules from other vocational qualifications (further and specialist vocational qualifications) or UAS degrees (Cedefop ReferNet Finland, 2012). Furthermore, students will be supported by implementing flexible and supportive practices, such as improved recognition of prior learning.

In order to respond to the demands for improved quality, the Finnish National Board of Education has, for example, introduced guidelines for quality management in VET

(Opetushallitus, 2007). Furthermore, this approach has been enhanced by the preparation of a strategy for the quality of VET (Ammatillisen koulutuksen laatustrategiaryhmä, 2011).

### **SOME THEMATIC ISSUES OF FINNISH VET**

#### **Apprenticeship training**

In Finland, apprenticeship training has been preserved as a minor route on the side of school-based initial VET. This section focuses on the development of apprenticeship training with respect to VET. We discuss its historical development and participation in youth and adult apprenticeship programmes.

In the 19<sup>th</sup> century, the guild system was responsible for ensuring that vocational skills were handed down from one generation of craftsmen to the next. Craftsmen mainly recruited apprentices from the poor rural areas (Kivinen & Peltomäki, 1999). For many children an apprenticeship was seen as the road to mastership and the lawful way to earn a livelihood.

The situation changed when the Act allowing citizen freedom to carry on a trade was passed in 1879. As a result, the guilds began to lose their power and the apprenticeship system began to break down. The low status of handicrafts drove apprentices to become unskilled factory workers as employees. The masters gradually became entrepreneurs and employers (Kivinen & Peltomäki, 1999; Särkikoski, 1993). Apprentices and journeymen were paid like other employees, and therefore the apprenticeship tradition became part of the system of wage-paid employment (Kivinen & Peltomäki, 1999).

According to Kivinen and Peltomäki (1999), the type of ‘dual’ training system that combines practical skills and general education did not take root in Finland. One reason might be that the factory owners, who had oriented towards mass production, had no time for instructing apprentices. Furthermore, working in the factories did not require very much theoretical knowledge because the necessary skills were provided on the job through experience (Kivinen & Peltomäki, 1999). The mechanization of work in the early stages of industrialization led to lowering the level of required vocational skills. In Finland the small demand for skilled labour could be employed, e.g., by foreign recruits (Kivinen & Peltomäki, 1999; Lappalainen, 1991; Tuomisto, 1986).

Finnish employers started to take an interest in vocational training only in the early 20th century when the factories began to establish their own vocational schools (Kivinen & Peltomäki, 1999). The employers’ aim was to ensure that the students in vocational schools agreed on employers’ interests because strikes were common (Tuomisto, 1986). According to Raivio (1919), vocational training was a mixture of the old apprenticeship system and a system of general education created to remedy its faults at the beginning of the 20th century.

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At the same time, there were different attitudes to vocational training in industry and to apprenticeships between the labour market organisations: the Finnish Employers' Confederation and the Central Organisation of Finnish Trade Unions (Kivinen & Peltomäki, 1999). The employers were in favour of apprenticeships, whereas the employees were against them because of a narrow vocational qualification. For the trade unions, the better solution was to increase the number of vocational schools.

The Apprenticeship Act was passed in 1923, but the employers were not enthusiastic about the law because they considered it inadequate and bureaucratic (Helvelahti, 1949; Kivinen & Peltomäki, 1999). Later the Act was declared a failure. The reasons—such as the obligations falling on the employer, the difficulty of terminating an apprenticeship, the unwillingness of young people to embark on a long term of service, the employers' lack of motivation for teaching apprentices, the lack of supervision by the authorities, and the difficulties of arranging the theoretical side of instruction—were the same that plagued the apprenticeship up to the 1990s (Kivinen & Peltomäki, 1999).

The Apprenticeship Act of 1968 did not change the situation because both employers and employee organisations saw apprenticeships as complementary to institutional forms of vocational education (Kivinen & Peltomäki, 1999). The traditional apprentice–journeyman–master career path came to an end in 1972 when the revision of Degree Reform occurred.

The Finnish tradition has not obliged the employers to take a greater responsibility for training of newcomers to their field of industry. They have preferred to leave training to the state and the municipalities as well as to the representatives of the employees (Kivinen & Peltomäki, 1999). Apprenticeship training was considered appropriate as an alternative for those minorities who had not applied or been accepted for the normal vocational training in institutions (Kaisaniemi, 1987).

A new Apprenticeship Act was launched in 1992 (Laki oppisopimuskoulutuksesta (1605/1992), 1992). Its aim was to improve the status of apprenticeship training as a work-oriented form of training in an otherwise mainly institutional vocational education system during the time of recession (Poutanen, 2008). Furthermore, it was hoped that the apprenticeship training would interest unemployed, unskilled, young people at risk of marginalisation to find jobs and earn their livelihood (Kivinen & Peltomäki, 1999). The developments and legislation of apprenticeship training before 1995 are presented in a compact format in Table 4 (adopted from Kivinen & Peltomäki, 1999).

The Apprenticeship Act was overruled in 1999 when new legislation for education was adopted (Oppisopimuskoulutuksen ja työelämäyhteyksien johtoryhmä, 2001). The regulations considering apprenticeships were embedded in the Act (Laki ammatillisesta koulutuksesta 630/1998) and Decree (Asetus ammatillisesta koulutuksesta 811/1998) on vocational education. Since 1999, entrepreneurs have also had the right to participate in the apprenticeship scheme (Oppisopimuskoulutuksen ja työelämäyhteyksien johtoryhmä, 2001).

In the present apprenticeship model, each apprentice is given a personal study plan (Ministry of Education and Culture, 2014). The plan is based on a national core curriculum issued by

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the Finnish National Board of Education. When a student is targeting competence-based qualification, the curriculum is based on the requirements of competence-based qualifications.

Table 4

*Apprenticeship in Finland from the 17<sup>th</sup> Century to the 1990s (Adopted from Kivinen & Peltomäki, 1999, p. 81)*

Period	Legislation	Description
Urban Craft Guilds 17 <sup>th</sup> to early 18 <sup>th</sup> century	Guild regulations	<ul style="list-style-type: none"> <li>● strict regulation of crafts and trades</li> <li>● stable market</li> <li>● clearly defined career path from apprentice to master</li> </ul>
Early industrialisation 18 <sup>th</sup> to late 19 <sup>th</sup> century	Ordinance on halls (1739)	<ul style="list-style-type: none"> <li>● increasing competition</li> <li>● increasing number of apprenticeships</li> <li>● division of labour</li> </ul>
First industrial age late 19 <sup>th</sup> and early 20 <sup>th</sup> century	Freedom of trade (1879) lower level trade schools (1885)	<ul style="list-style-type: none"> <li>● handicrafts become small industries</li> <li>● apprentices become wage earners</li> <li>● general education</li> </ul>
Issue of vocational education	Act on Apprenticeships (1923)	<ul style="list-style-type: none"> <li>● general vocational schools (1920)</li> <li>● fear of crafts disappearing</li> </ul>
Second industrial age, broadening of education from World War II to 1960s	Act on Vocational Education Institutions (1958)	<ul style="list-style-type: none"> <li>● state-run central vocational schools</li> <li>● municipal vocational schools</li> <li>● adult and further education</li> </ul>
Centralisation of schooling 1960s to 1990s	Reform of Apprenticeship Act (1968), Degree Reform (1972), reform of postsecondary education	<ul style="list-style-type: none"> <li>● journeyman and master titles become vocational qualifications</li> <li>● apprenticeship system to complement institutional vocational training</li> </ul>
Changes in employment situation and competence requirements	Reform of Apprenticeship Act (1992)	<ul style="list-style-type: none"> <li>● increasing competition</li> <li>● apprenticeship training as part of labour policy</li> </ul>

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Approximately 70–80% of the learning takes place under the supervision of an on-the-job-instructor at the workplace, while vocational institutions provide the supplementary theoretical instruction. The trainees receive a salary from the employer according to salary levels defined by collective agreements. During the periods that trainees are studying at vocational education institutions, they are entitled to get, e.g., daily allowances and subsidised travelling and accommodation. Employers having trainees are reimbursed for their provision of education (Ministry of Education and Culture, 2014).

The development plan for education and research for the years 1995–1999 set the target of increasing participation in apprenticeship training. The aim was that participation within the apprenticeship scheme would cover 20% of the total of initial vocation education and training offered to youth (Oppisopimuskoulutuksen ja työelämäyhteyksien johtoryhmä, 2001). By 2001 it was recognized that the target had not been met (Oppisopimuskoulutuksen ja työelämäyhteyksien johtoryhmä, 2001, p. 21). The marginal role of apprenticeship training in the Finnish VET in 1840–1995 has been captured by Heikkinen (2000, see Table 5). The popularity of apprenticeship training has gradually increased since the 1990s but only moderately (cf. Rinne & Järvinen, 2011).

The development of participation in apprenticeship training in general since 1997 can be seen in Table 6. While numbers presented in the table include apprentices offered initial vocational education as well as specialist vocational qualifications, the increase in participation in the apprenticeship scheme may look considerable at first. A closer look at the division between

Table 5  
*Students in Apprenticeship Training Compared to School-based VET in all Branches*  
(Heikkinen, 2000, 2004a, 2004b)

Year	Apprenticeship contracts	Students in VET schools	Percentage of apprenticeships in VET
1840	1741	about 1,000	-
1875	220		
1880*	125	about 4,000	-
1924*	250	15,400	1.6
1930	1,179	20,312	5.5
1960*	3,159	53,196	5.6
1970	2,687	98,706	2.7
1980	5,157	137,908	3.6
1990	7,235	162,535	4.3
1993*	10,025	199,525	4.8
1995	12,79	203,134	5.9

\* 1879, 1923, and 1992: Trade Acts/Acts on apprenticeship; 1960s: influence from reform of apprenticeship programmes in the 1950s; until the 1960s, apprenticeships were formally recognised mainly in crafts, manufacturing, and retail; since the 1980s, apprenticeship is primarily adult education, which can take place in most occupational branches. In the 1990s, comparisons are difficult since half of the previous VET was transformed to higher education as polytechnics (UAS).

Table 6

*The Number of Apprentices in Finland 1997–2012: Students, New Entrants, and Graduates who have Participated in Education for Initial, Further, and Specialist Vocational Qualifications*

Year	Students	New entrants	Graduates
1997	27,613	15,128	4,171
1998	38,908	19,764	8,142
1999	35,316	11,058	7,986
2000	36,029	15,385	7,501
2001	38,963	16,847	7,780
2002	41,459	18,102	7,909
2003	45,321	19,316	8,489
2004	47,685	19,142	11,415
2005	51,307	20,066	12,471
2006	54,632	21,793	12,561
2007 <sup>1</sup>	63,295	28,375	10,980
2008 <sup>2</sup>	70,037	28,013	12,193
2009 <sup>3</sup>	65,997	20,121	14,320
2010 <sup>4</sup>	59,702	21,674	14,306
2011 <sup>5</sup>	56,876	21,977	13,271
2012 <sup>6</sup>	55,554	20,911	13,039

*Note:* All data have been adopted from Statistics Finland.

Years 1997–2006: Statistics Finland (2008). Oppisopimuskoulutukseen osallistuneet, uudet opiskelijat ja todistuksen saaneet 1997–2006 (Excel, 21.5.).

[Http://www.stat.fi/til/aop/2006/04/aop\\_2006\\_04\\_2007-11-01\\_tie\\_004.html](http://www.stat.fi/til/aop/2006/04/aop_2006_04_2007-11-01_tie_004.html).

<sup>1</sup>(2008a). Oppisopimuskoulutuksessa 63 300 osallistujaa vuonna 2007. [Http://www.stat.fi/til/aop/2007/04/aop\\_2007\\_04\\_2008-11-03\\_tie\\_004.html](http://www.stat.fi/til/aop/2007/04/aop_2007_04_2008-11-03_tie_004.html).

<sup>2</sup>(2009). Oppisopimuskoulutuksessa 70 000 osallistujaa vuonna 2008. [Http://www.stat.fi/til/aop/2008/04/aop\\_2008\\_04\\_2009-11-03\\_tie\\_004.html](http://www.stat.fi/til/aop/2008/04/aop_2008_04_2009-11-03_tie_004.html).

<sup>3</sup>(2010). Oppisopimuskoulutuksessa 66 000 osallistujaa vuonna 2009. [Http://www.stat.fi/til/aop/2009/04/aop\\_2009\\_04\\_2010-11-03\\_tie\\_004\\_fi.html](http://www.stat.fi/til/aop/2009/04/aop_2009_04_2010-11-03_tie_004_fi.html).

<sup>4</sup>(2011). Oppisopimuskoulutuksessa 59 700 osallistujaa vuonna 2010. [Http://www.stat.fi/til/aop/2010/04/aop\\_2010\\_04\\_2011-11-03\\_tie\\_004\\_fi.html](http://www.stat.fi/til/aop/2010/04/aop_2010_04_2011-11-03_tie_004_fi.html).

<sup>5</sup>(2012). Oppisopimuskoulutuksessa 56 900 osallistujaa vuonna 2011. [Http://www.stat.fi/til/aop/2011/04/aop\\_2011\\_04\\_2012-11-06\\_tie\\_004\\_fi.html](http://www.stat.fi/til/aop/2011/04/aop_2011_04_2012-11-06_tie_004_fi.html).

<sup>6</sup>(2013c). Oppisopimuskoulutuksessa 55 600 osallistujaa vuonna 2012. [Http://www.stat.fi/til/aop/2012/04/aop\\_2012\\_04\\_2013-11-06\\_tie\\_004\\_fi.html](http://www.stat.fi/til/aop/2012/04/aop_2012_04_2013-11-06_tie_004_fi.html).

initial vocational qualifications, further qualifications, and specialist vocational qualifications is presented in Table 7 for the years 2005–2012. This shows that there has been a moderate increase in the participation in the apprenticeship scheme on the whole. Despite an increase from a total of 10,111 graduates to 13,039 graduates in 2005–2012, the proportion of those having completed the initial vocational qualification through the apprenticeship scheme has remained between 30–45% among all apprentices.

The rate of qualifications completed in initial vocational education and training through the apprenticeship scheme (described above) means that even though the apprenticeship scheme was enhanced on the whole in Finland in 2000–2012, it has not become a particularly strong model of youth education within the Finnish educational system. The relative growth of the apprenticeship scheme can be seen in Table 8. When 18.4% of all VET

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Table 7

*Apprenticeship Training in Finland 2005–2012: Entrants, Apprentices, and Graduates*

Year	New entrants			Apprentices			Graduates				
	Total	Total	Women %	Initial vocational qualifications %	Further vocational qualifications %	Specialist vocational qualifications %	Total	Women %	Initial vocational qualifications %	Further vocational qualifications %	Specialist vocational qualifications %
2005 <sup>1</sup>	20,066	51,307	51	37	35	28	10,111	55	32	39	29
2006 <sup>2</sup>	21,793	54,632	49	40	34	26	11,097	55	30	39	31
2007 <sup>3</sup>	28,375	63,295	48	43	33	24	10,980	55	32	40	28
2008 <sup>4</sup>	28,013	70,037	46	45	32	23	12,193	52	33	40	27
2009 <sup>5</sup>	20,121	65,997	47	43	32	25	14,320	50	39	37	24
2010 <sup>6</sup>	21,674	59,702	50	39	33	28	14,306	50	42	32	26
2011 <sup>7</sup>	21,977	56,876	52	41	30	29	13,271	55	45	30	25
2012 <sup>8</sup>	20,911	55,554	53	36	34	30	13,039	55	31	39	30

*Note:* All data have been adopted from Statistics Finland. The year and heading of their publication on Statistic Finland's webpages are as follows:

<sup>1</sup>(2006). Oppisopimuskoulutuksessa 51 300 osallistujaa vuonna 2005. [http://www.stat.fi/til/aop/2005/04/aop\\_2005\\_04\\_2006-11-02\\_tie\\_004.html](http://www.stat.fi/til/aop/2005/04/aop_2005_04_2006-11-02_tie_004.html).

<sup>2</sup>(2007). Oppisopimuskoulutuksessa 54 600 osallistujaa vuonna 2006. [http://www.stat.fi/til/aop/2006/04/aop\\_2006\\_04\\_2007-11-01\\_tie\\_004.html](http://www.stat.fi/til/aop/2006/04/aop_2006_04_2007-11-01_tie_004.html).

<sup>3</sup>(2008a). Oppisopimuskoulutuksessa 63 300 osallistujaa vuonna 2007. [http://www.stat.fi/til/aop/2007/04/aop\\_2007\\_04\\_2008-11-03\\_tie\\_004.html](http://www.stat.fi/til/aop/2007/04/aop_2007_04_2008-11-03_tie_004.html).

<sup>4</sup>(2009). Oppisopimuskoulutuksessa 70 000 osallistujaa vuonna 2008. [http://www.stat.fi/til/aop/2008/04/aop\\_2008\\_04\\_2009-11-03\\_tie\\_004.html](http://www.stat.fi/til/aop/2008/04/aop_2008_04_2009-11-03_tie_004.html).

<sup>5</sup>(2010). Oppisopimuskoulutuksessa 66 000 osallistujaa vuonna 2009. [http://www.stat.fi/til/aop/2009/04/aop\\_2009\\_04\\_2010-11-03\\_tie\\_004\\_fi.html](http://www.stat.fi/til/aop/2009/04/aop_2009_04_2010-11-03_tie_004_fi.html).

<sup>6</sup>(2011). Oppisopimuskoulutuksessa 59 700 osallistujaa vuonna 2010. [http://www.stat.fi/til/aop/2010/04/aop\\_2010\\_04\\_2011-11-03\\_tie\\_004\\_fi.html](http://www.stat.fi/til/aop/2010/04/aop_2010_04_2011-11-03_tie_004_fi.html).

<sup>7</sup>(2012). Oppisopimuskoulutuksessa 56 900 osallistujaa vuonna 2011. [http://www.stat.fi/til/aop/2011/04/aop\\_2011\\_04\\_2012-11-06\\_tie\\_004\\_fi.html](http://www.stat.fi/til/aop/2011/04/aop_2011_04_2012-11-06_tie_004_fi.html).

<sup>8</sup>(2013c). Oppisopimuskoulutuksessa 55 600 osallistujaa vuonna 2012. [http://www.stat.fi/til/aop/2012/04/aop\\_2012\\_04\\_2013-11-06\\_tie\\_004\\_fi.html](http://www.stat.fi/til/aop/2012/04/aop_2012_04_2013-11-06_tie_004_fi.html).

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Table 8

*The number of Graduates from Apprenticeship Training Compared to the Number of all Graduates from VET in Finland in 2000–2012*

Year	New entrants (apprentices)	Graduated apprentices	VET graduates in total*	Proportion of apprentices as a % of all VET students in the respective year
2000	15,385 <sup>1</sup>	7,501 <sup>1</sup>	55,477 <sup>2</sup>	13.5
2001	16,847 <sup>1</sup>	7,780 <sup>1</sup>	52,545 <sup>2</sup>	14.8
2002	18,102 <sup>1</sup>	7,909 <sup>1</sup>	52,041 <sup>2</sup>	15.2
2003	19,316 <sup>1</sup>	8,489 <sup>1</sup>	54,079 <sup>2</sup>	15.7
2004	19,142 <sup>1</sup>	11,415 <sup>1</sup>	56,678 <sup>2</sup>	20.1
2005	20,066 <sup>1</sup>	12,471 <sup>1</sup>	58,197 <sup>2</sup>	21.4
2006	21,793 <sup>1</sup>	12,561 <sup>1</sup>	60,280 <sup>2</sup>	20.8
2007	28,375 <sup>3</sup>	10,980 <sup>3</sup>	62,186 <sup>9</sup>	17.7
2008	28,013 <sup>4</sup>	12,193 <sup>4</sup>	62,498 <sup>9</sup>	19.5
2009	20,121 <sup>5</sup>	14,320 <sup>5</sup>	66,427 <sup>9</sup>	21.6
2010	21,674 <sup>6</sup>	14,306 <sup>6</sup>	67,957 <sup>9</sup>	21.1
2011	21,977 <sup>7</sup>	13,271 <sup>7</sup>	70,596 <sup>9</sup>	18.8
2012	20,911 <sup>8</sup>	13,039 <sup>8</sup>	70,803 <sup>9</sup>	18.4

Note: \*VET graduates in total include not only school-based vocational qualifications but also apprenticeships and competence-based qualifications. All data have been adopted from Statistics Finland. The year and heading of publication on Statistic Finland's webpages are as follows:

<sup>1</sup>(2008). Oppisopimuskoulutukseen osallistuneet, uudet opiskelijat ja todistuksen saaneet 1997–2006 (Excel, 21.5.).

[Http://www.stat.fi/til/aop/2006/04/aop\\_2006\\_04\\_2007-11-01\\_tie\\_004.html](http://www.stat.fi/til/aop/2006/04/aop_2006_04_2007-11-01_tie_004.html).

<sup>2</sup>(2008b). Tutkintotavoitteisen koulutuksen opiskelijamäärän kasvu hidastunut.

[Http://www.stat.fi/til/opiskt/2007/opiskt\\_2007\\_2008-01-25\\_tie\\_001.html](http://www.stat.fi/til/opiskt/2007/opiskt_2007_2008-01-25_tie_001.html).

<sup>3</sup>(2008a). Oppisopimuskoulutuksessa 63 300 osallistujaa vuonna 2007.

[Http://www.stat.fi/til/aop/2007/04/aop\\_2007\\_04\\_2008-11-03\\_tie\\_004.html](http://www.stat.fi/til/aop/2007/04/aop_2007_04_2008-11-03_tie_004.html)

<sup>4</sup>(2009). Oppisopimuskoulutuksessa 70 000 osallistujaa vuonna 2008.

[Http://www.stat.fi/til/aop/2008/04/aop\\_2008\\_04\\_2009-11-03\\_tie\\_004.html](http://www.stat.fi/til/aop/2008/04/aop_2008_04_2009-11-03_tie_004.html).

<sup>5</sup>(2010). Oppisopimuskoulutuksessa 66 000 osallistujaa vuonna 2009.

[Http://www.stat.fi/til/aop/2009/04/aop\\_2009\\_04\\_2010-11-03\\_tie\\_004\\_fi.html](http://www.stat.fi/til/aop/2009/04/aop_2009_04_2010-11-03_tie_004_fi.html).

<sup>6</sup>(2011). Oppisopimuskoulutuksessa 59 700 osallistujaa vuonna 2010.

[Http://www.stat.fi/til/aop/2010/04/aop\\_2010\\_04\\_2011-11-03\\_tie\\_004\\_fi.html](http://www.stat.fi/til/aop/2010/04/aop_2010_04_2011-11-03_tie_004_fi.html).

<sup>7</sup>(2012). Oppisopimuskoulutuksessa 56 900 osallistujaa vuonna 2011.

[Http://www.stat.fi/til/aop/2011/04/aop\\_2011\\_04\\_2012-11-06\\_tie\\_004\\_fi.html](http://www.stat.fi/til/aop/2011/04/aop_2011_04_2012-11-06_tie_004_fi.html).

<sup>8</sup>(2013c). Oppisopimuskoulutuksessa 55 600 osallistujaa vuonna 2012.

[Http://www.stat.fi/til/aop/2012/04/aop\\_2012\\_04\\_2013-11-06\\_tie\\_004\\_fi.html](http://www.stat.fi/til/aop/2012/04/aop_2012_04_2013-11-06_tie_004_fi.html).

<sup>9</sup>(2014). Tutkintoon johtavan koulutuksen opiskelijat ja suoritettut tutkinnot.

[Http://www.stat.fi/tup/suoluk/suoluk\\_koulutus.html](http://www.stat.fi/tup/suoluk/suoluk_koulutus.html)

qualifications were completed through apprenticeship scheme in 2012, calculations based on the figures presented in Tables 8 and 9 show that the number of initial VET graduates was around 4,000 in 2012. The numbers of graduates from the apprenticeship scheme considering initial vocational education have varied notably. For example, in 2011 there were still around 6,000 initial VET graduates (which can be seen by comparing Tables 8 and 9). The considerable variance in the numbers of graduates is partly an outcome of the effects that recession has had on employment since 2008. In addition, the numbers of student places available in institutional education, provision of adult education motivated by labour policy, and the numerous projects targeted at reducing youth unemployment have had an effect on young people's interest in the apprenticeship scheme (see also Kivinen & Peltomäki, 1999). In Finland, apprenticeship training has remained targeted mainly at adult (further) education.

## Teacher education

In the development of VET, the qualification requirements of VET teachers have also been redefined (see Table 9). In the 1980s vocational teacher training curricula were reformed by increasing the proportion of vocational pedagogy. Upper secondary education reform included that the teacher qualification should be at least one level higher than that of their students. Accordingly, extensive training to upgrade the teachers' qualifications were arranged, e.g., technicians taking engineering degrees (Numminen, 2000). The teachers had to participate in in-service training for at least 5 days a year. In the 1990s this kind of training for teachers was transferred to the educational providers (Numminen, 2000).

VET teacher training was centralised in the polytechnics in 1995. The extent of the teachers' pedagogical studies is 35 credits. The pedagogical studies for general subject teachers in VET are provided by universities, and the study extent corresponds to that of VET teachers (Numminen, 2000).

Table 9

*Changes in the Qualification Requirements for Teachers in Vocational Education Institutions and in Vocational Teacher Training Institutions (Numminen, 2000)*

1970s and earlier	1980s	1990s
Teachers' educational background varied depending on the vocational field, from folk school up to university degrees. Qualifications and qualification requirements varied from field to field. In some fields there was no teacher training.	Teachers required to have an education at least one level higher than that of their students; upgrading training (mainly in the technical field) arranged to achieve this. Structure of teacher training harmonised; the extent of the teacher programmes made 40 credits in all vocational fields.	Teachers required to have a polytechnic or other tertiary degree.  Teacher training programmes of 35 credits.
Individual teacher training institutions served specific vocational fields (about 20 in all).	As before  General-subject teachers trained at various teacher training institutions and at universities.	Centralised vocational teacher training provision in five polytechnics.  General-subject teachers trained at universities.

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Appendices. Table A1

*The Number of Vocational Education Institutions during the Decades 1820–1990 (Adopted from Klemelä, 1999)*

	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990
Seafaring institutions	3	3	3	3	3	6	7	7	9	14	7	6	6	4	4	7	8	5
Business colleges			1	1	1	2	2	7	11	17	19	22	21	25	43	72	75	69
Agricultural schools			1	2	6	14	37	35	77	90	78	107	94	103	93	68	61	60
Forestry schools							1	1	1	5	5	5	7	7	22	28	28	25
Institutes of technology								5	10	10	12	12	14	16	19	28	31	32
Vocational schools								30	40	46	43	48	55	95	121	166	142	147
Handicraft schools									75	109	108	110	114	124	129	100	41	43
Domestic services									8	25	39	42	47	63	64	67	56	51
Nursing and health education												8	11	13	17	42	40	48
Tourism and catering institutions																	9	14
Social services institutions																		27
Other middle level institutions																	23	25
Total	3	3	5	6	10	22	47	85	231	316	311	360	369	450	512	578	514	546

Captions:

The numbers for agricultural schools include gardening institutions. The number of agricultural schools in 1970 refers to the number of agricultural schools in 1971 (KM 1973:105, 106).

The number of domestic schools in 1970 refers to the number of domestic schools in 1968 (KM 1970:A, 11, 62).

The number of domestic schools in 1900 does not include some specific schools for housewives.

The numbers considering nursing and health education in 1930–1960 only include schools that were providing education for nurses, midwives, and public health nurses because the official statistics of the time did not register individual courses organised in the field. The number of institutions in 1970 refers to the number of institutions in 1968 (KM 1970:A 11, 62). The number of institutes in 1980 includes numbers of institutions providing education for beauty care and other health education. In 1990 the classification used in the official statistics for these colleges was changed to a broader one.

The class ‘other middle level institutions’ includes art education, guarding and protection institutions, sports and arts leader etc. institutions, and centres of education.

The names of handicraft education institutions also changed throughout 1980 and 1990.

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Appendices. Table 2

*The Numbers of Students Participating in Vocational Education during the Decades 1820–1990 (Adopted from Klemelä, 1999)*

	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990
Seafaring institutions	11	48	110	128	127	173	209	156	245	218	107	255	353	203	262	681	1,152	785
Business colleges			38	7	24	47	67	443	754	1,975	3,160	3,199	3,352	4,651	10,646	19,697	28,742	33,516
Agricultural schools								539	1,053	1,783	1,910	3,997	3,130	3,545	4,023	3,698	5,816	5,796
Forestry schools									14	157	167	172	315	376	358	1,416	2,935	2,656
Institutes of technology								223	449	552	503	1,574	2,068	3,979	6,477	14,880	18,109	20,288
Vocational schools								1,650	2,605	2,993	3,438	4,657	5,893	10,143	27,487	43,815	53,281	48,950
Handicraft schools									3,173	2,065	3,502	1,934	2,540	2,345	2,424	2,622	3,371	5,731
Domestic services									35	843	1,183	2,062	2,519	2,590	3,157	5,485	7,650	5,893
Nursing and health education									64	53	39	163	525	1,642	2,257	7,179	12,756	25,157
Tourism and catering institutions																	1,827	3,111
Social services institutions																		8,526
Other middle level institutions																	2,267	1,732
Total	11	48	148	135	151	220	276	3,011	8,392	10,639	14,009	18,013	20,380	29,098	56,733	98,057	137,906	162,141

Captions:

The numbers of students in agricultural schools include students in gardening institutions.

The number of students in institutes of technology in 1900 does not include students of Pori industrial school.

The number of students in domestic education in 1900 does not include the numbers of students in specific housewife education institutions.

Differing from other fields of education, the number of students in nursing education refers to the number of graduates in 1910–1960, according to Statistics Finland. The numbers of students in nursing and health education in 1980 include students who participated in beauty care and other health education. The student numbers of 1990 include those participating in nurse and health education according to the broader new classification practice.

The class ‘other middle level institutions’ includes art education, guarding and protection institutions, sports and arts leader etc. institutions, and centres of education.

The names of handicraft education institutions also changed throughout 1980 and 1990.