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Chapter

Sustaining Dual Apprenticeship Systems: Similarities and Differences in Austria, Germany, and Switzerland

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Abstract

Based on the German collective skill formation system of dual apprenticeship has received international attention as a potential approach to sustain and develop upper secondary vocational education and training (VET) as an alternative to higher education. Austria, Germany, and Switzerland are considered paradigmatic cases for such a strategy, pointing to similar structures in these countries. At closer look, these three systems also show substantial differences in sustaining upper secondary VET and coping with the repeated crises in the youth labor market. This chapter analyses key differences between these paradigmatic cases beyond structural similarities. International comparative data, literature review, and policy analysis are used as methodology. Results from the analysis of comparative indicators show first that overall education structures do not differ much from European and international averages, second that the expectation of a direct reduction of youth unemployment by apprenticeship is not corroborated by data, third that the employment relation in apprenticeship does not generally induce more emphasis on labor market policy to fight youth unemployment, finally that two of the three systems under focus show different forms of drift of apprenticeship towards tertiary education. The specific elements of apprenticeship generating sustainability and influencing youth unemployment deserve further research.

Keywords: dual apprenticeship system, comparative research, youth unemployment, Austria, Germany, Switzerland

1. Introduction

Historically, the institution of apprenticeship was quite universally embedded as a kind of “natural” education and training practice in craft production systems for centuries [1, 2]. Besides its socializing functions, this institution played important roles in the regulation and steering of access to established formalized occupational systems. Schools have evolved in parallel, first organized by religious institutions, later taken over by (national) states, to provide more general educational functions

beyond preparation for work and occupations. From early times apprenticeships have been complemented by some kind of schooling (Sunday schools) for general and/or religious education. With the emergence of a conceptual and ideological linkage of school education with the ideas of universal human education and with the academic systems of universities a fundamental division and contrasting juxtaposition between general and vocational education has been established that still prevails at the background of discourses around education policies.

A main step towards bridging this division was ideas in German vocational pedagogy of combining school with apprenticeship in the 1920s (with e.g., Eduard Spranger, or Georg Kerschensteiner as pioneers [3, 4]), followed by strong legal regulations of the dual apprenticeship systems in Germany, Switzerland, and Austria in the 1960s that established complex systems of regulations of occupations and industrial relations, combined with part-time compulsory vocational schools. A byproduct of these regulations was the emergence of multi-level, multi-stakeholder governance systems that combined various actors from the economy and the state in kinds of collective skills formation [5].

However, the discoveries of the emergence of the service society and the technical-scientific revolutions in production during the 1960s and 1970s have shifted political and conceptual attention towards general academic and higher education. The division between vocational and academic education was reinforced, and early vocational education at the upper secondary level came under scrutiny – the production of technical and scientific personnel emerged as a common priority. For decades, the dual apprenticeship system shifted into a defensive position, under the fear of hindering young people's access to upper-level competencies. It was only inspired by the increased national and international attention to youth employment problems and unemployment challenges from the 1980s onward that the potentials of apprenticeship for the youth labor market were gradually rediscovered at a broader scale. It lasted some further decades, till the 2000s, that proposals for kinds of dual apprenticeship became a political priority again, inspired by the discovery of the Organization for Economic Co-operation and Development (OECD) and Group of Twenty (G20) countries that Germany as a paradigmatic dual apprenticeship country showed more favorable figures at the youth labor market (see the documentation of recent political interest and commitment in apprenticeships in [6]).

Despite the promising impact of vocational education on youth employment and the youth labor market, the political priorities about the “right mix” in the provision of education distributed between early vocational and higher education remain heavily disputed. The fear that talent might be guided into a dead-end of early practical training cut-off from further career opportunities towards broader education is a main adverse issue to apprenticeship. “A commonly held view is that work-based learning (WBL) schemes, such as apprenticeships, impose a glass ceiling on career progression. ... Apprenticeship, in many countries, is perceived to be for poorly performing students and school drop-outs” ([7], p. 1). To counter this challenge steps of upgrading parts of apprenticeship are reported, “countries such as Australia, Germany, India, Switzerland, the United Kingdom and the United States have started to expand apprenticeships at the higher education level” ([7], p. 16).

Two further questions about the role and impact of upper secondary VET and apprenticeship have been raised in research, first whether the short-term advantage in youth employment might be in fact related to longer-term disadvantage because of the acquisition of too narrow competencies for longer-term progression and demands (see [8]), and second, whether a focus on secondary level vocational education might

restrain the urgent development of science-technology-oriented innovation as the main source of growth in new growth theory [9, 10]. The latter issue of promoting science-technology innovation via the expansion and upgrading of higher education vs. secondary vocational education has triggered quite aggressive discourses against the academic upgrading policy in Switzerland and Germany (catchwords are “academic trap”, or “academic delusion”).

This chapter provides some exploration of structural and performance-related aspects in the three paradigmatic apprenticeship countries, looking at differences concerning key aspects of apprenticeship policy behind a similar basic structure. Four research questions are explored through comparative data, first, whether the international data indicate influences of VET on the education structure through limiting participation in tertiary education or reducing exclusion towards low-level education; second, whether comparative data reinforce a reduction of youth unemployment through established apprenticeship systems; third, whether the employment relation in apprenticeship leads to a stronger involvement of labor market policy for young people; and fourth, how apprenticeship is positioned in the progression of educational pathways between upper secondary and tertiary education.

The recent 2019 Wiley Handbook of Vocational Education and Training [11] justifies the prominent role of the three selected countries as paradigmatic apprenticeship countries by mentioning them several times in various chapters as a kind of *trilogy* of fully developed dual apprenticeship systems. Germany is by far the most mentioned country in the handbook (281 hits), and Switzerland and Austria are very often mentioned together in connection with the trilogy (overall a smaller number of hits of 75 and 31; out of the mentions in text forty to sixty percent of mentions are in directly combined phrases of all the three trilogy countries). Overall, the perspectives of dual apprenticeship are appreciated quite skeptically, with tertiarization and hybridization being important competing trends, and transfer to other countries being difficult [12, 13].

2. Configurations of sustained dual apprenticeship systems in Austria, Germany, and Switzerland

The plenty of elements necessary to establish a “quality apprenticeship” [6, 7] have been identified through various steps and discourses since the 2010s. These discourses have taken different starting points for the identification of apprenticeship provisions that can be ordered at a continuum between a modular and a holistic approach. A modular approach identifies apprenticeship as a conglomerate of elements around forms of work-based learning (WBL), whereas the holistic approach identifies complex configurations of interconnected elements necessary for the proper functioning of the system. The various approaches taken over time have been condensed in the International Labour Organization (ILO) concept of “quality apprenticeship” [6] that encompasses ten key features (a tripartite system of governance, remuneration, a written agreement, social security coverage, a legal framework, a program of learning, duration, both on-the-job and off-the-job learning components, a formal assessment process, a recognized qualification) ordered by six building blocks (meaningful social dialog, inclusiveness, robust regulation, strong labor market, clear roles and responsibilities, equitable funding). This demanding systemic approach has been widely adopted in political discourses in the meantime.

A definition of apprenticeship given for the United States (US) draws a basic distinction to internships. “Apprenticeships provide long-term paid work-based

learning opportunities and structured educational curricula that ensure the learner gains education and hands-on experience in an occupation, similar to how we train medical doctors with a mix of classes and residency experience. ... Short-term work-based learning programs such as internships or staff development programs are not apprenticeships” [14]. In European Union (EU) research the different approaches of holistic and modular structures have been applied. Based on a modular approach an inventory of apprenticeships and work-based learning in the European Union has identified a widespread use of such practices [15].

The full definition of quality apprenticeships follows a good deal of the established structures in the paradigmatic countries analyzed in this chapter. Nevertheless, these structures differ in many aspects. Previous research and documentation have shown that apprenticeship is differently embedded in the overall education structures, in connection with compulsory education on the one hand, and with tertiary education on the other. Germany and Switzerland differ from Austria in both respects. On the side of compulsory education both former countries have gradually increased the educational and competence input before the transition into apprenticeship, whereas Austria has not changed the structure of this transition with the criteria of only reaching age fifteen as the minimum age requirement of fulfilling nine years of compulsory education, without any credential required. Austrian apprentices are therefore persistently mainly of the age 15-to-18-years old age group, and the original idea of building the Fachhochschule sector on top of apprenticeship failed; a vocational baccalaureate was established not before the late 2000s.

In Germany, a medium-level school credential (*Mittlere Reife*) was established with additional schooling time between the minimum compulsory school and the upper-level academic school that included partly the access criteria for tertiary education. The main access to dual apprenticeship shifted gradually to this medium-level credential from *Realschule*, which provided the choice of prolonged compulsory school time; in addition, graduates from academic schools holding credentials for access to tertiary education also increasingly have chosen access to apprenticeship. Consequently, the age of apprentices shifted increasingly upward towards the age groups for tertiary education; in the early 2000s the average age of German apprentices was already almost twenty ([16], p. 163), and currently, almost half of apprenticeship beginners own the medium level credential, and an additional quarter own the credential from academic school with access to tertiary education ([17], p. 44). In Switzerland, the structure of compulsory education varies by regional units (Cantons) with a range of duration and broader access to academic schools with flexible and mixed access to dual apprenticeship [18–20]. The connection between vocational and academic education was increased through the vocational baccalaureate (*Berufsmaturität*) established in the mid-1990s, and subsequently the creation of the universities of applied science (*Fachhochschule*) in the late 1990s with exclusive access from the apprenticeship system. Consequently, the apprenticeship system is situated at the lowest end of the overall education structure in Austria [21, 22], whereas this system has increasingly shifted upward towards tertiary education in Germany and Switzerland; this creates substantial cracks in the trilogy. The further analysis of comparative data tries to find empirical representations of this crack, in order to explore its depth.

2.1 Apprenticeship in overall aggregate education structures: indications about its relationship to low-level and higher education

This section explores to what extent the educational structures in the three countries with strong paradigmatic dual apprenticeship systems at the upper secondary

level differ from broader reference aggregates of countries (EU22, OECD, and G20) in some key characteristics of overall education structures. **Table 1** gives an overview of observations to the questions addressed.

- Are there signs that strong upper secondary education provides better access to qualifications for all groups of the population so that the proportion of low-qualified adults or young people (attainment below upper secondary education) is reduced? The educational attainment of the adult population below the upper secondary level is in apprenticeship countries lower than at EU22 average (this applies to all three countries). Upper secondary attainment is higher than at EU22 average (this applies to Austria and Switzerland) and tertiary/postsecondary attainment is lower than at EU22 average (this applies only to Austria)
- Is the strong upper secondary structure related to a lower propensity of progressing towards tertiary education that has become a dominant reference level of a competitive education structure in the so-called knowledge-based economy? In the apprenticeship countries' aggregate, the proportion of masters' certificates is at average OECD level (less frequent than EU22) and the proportion

1. Adult (25-64y) population attainment							
Adult attainment (percentage, column)							
	AT	DE	CH	Av.appr	Av.EU22	Av.OECD	Av.G20
below upsec	14,1	14,7	12,6	13,8	16,4	20,1	26,0
Upsec	48,5	40,9	42,4	43,9	40,2	36,3	30,4
above upsec	37,5	44,4	45,0	42,3	43,9	46,9	37,9
Adult attainment compared to OECD average (index, OECD = 1)							
	AT	DE	CH	Av.appr	Av.EU22	Av.OECD	Av.G20
below upsec	0,70	0,73	0,63	0,68	0,82	1,00	1,30
Upsec	1,34	1,13	1,17	1,21	1,11	1,00	0,84
above upsec	0,80	0,95	0,96	0,90	0,94	1,00	0,81
2. Profile of adult (25-64y) population tertiary/postsecondary attainment							
Profile of adults above upper secondary attainment (percentage, column)							
	AT	DE	CH	Av.appr	Av.EU22	Av.OECD	Av.G20
ps-sc*	17,9	13,8	0,0	10,6	10,4	12,9	10,7
Bachelor	4,9	17,5	24,0	15,5	15,2	18,9	17,4
Master	13,6	11,3	17,9	14,3	17,0	13,9	8,6
Doctorate	1,1	1,7	3,0	1,9	1,2	1,3	1,2
*ps-sc = postsecondary plus short cycle							
Adult profile compared to OECD average (index, OECD = 1)							
	AT	DE	CH	Av.appr	Av.EU22	Av.OECD	Av.G20
ps-sc	1,38	1,07		0,82	0,81	1,00	0,83
Bachelor	0,26	0,93	1,27	0,82	0,81	1,00	0,92
Master	0,98	0,82	1,29	1,03	1,23	1,00	0,62
Doctorate	0,86	1,36	2,43	1,55	0,99	1,00	0,93

3. Adult (25-64y) population tertiary attainment by fields of study

Profile of adult fields of study (percentage, row)

	AT	DE	CH	Av.appr	Av.EU22	Av.OECD
Educ	10,9	13,5	8,5	11,0	11,8	12,3
health-wf	8,8	9,5	15,0	11,1	12,9	13,0
hum-soc	13,7	13,3	11,7	12,9	19,1	18,1
bus-adm	24,4	22,8	28,8	25,3	22,5	24,0
n-sci	3,8	5,1	5,1	4,7	5,1	4,9
engi-man	26,3	25,4	18,7	23,5	16,4	15,8
Ict	2,7	4,2	4,6	3,8	4,8	4,8
Oth	9,5	6,2	7,5	7,7	7,4	7,2

educ = Education; health-wf = Health and welfare; hum-soc = Arts or humanities, social sciences, journalism and information; bus-adm = Business, administration and law; n-sci = Natural sciences, mathematics and statistics; engi-man = Engineering, manufacturing and construction; ict = Information and communication technologies (ICT); oth = Other fields

Adult tertiary fields of study compared to OECD average (index, OECD = 1)

	AT	DE	CH	Av.appr	Av.EU22	Av.OECD = 1
Educ	0,89	1,10	0,69	0,89	0,96	1,00
health-wf	0,67	0,73	1,15	0,85	0,99	1,00
hum-soc	0,76	0,74	0,65	0,71	1,06	1,00
bus-adm	1,02	0,95	1,20	1,06	0,94	1,00
n-sci	0,77	1,05	1,05	0,96	1,05	1,00
engi-man	1,66	1,61	1,18	1,48	1,04	1,00
Ict	0,56	0,87	0,97	0,80	1,01	1,00
Oth	1,32	0,86	1,05	1,08	1,03	1,00

4. Adult (25-64y) population attainment compared to young (25 – 34y) generation

Adult population compared to young generation attainment (percentage, column)

	AT	DE	CH	Av.appr	Av.EU22	Av.OECD	Av.G20
below upper secondary							
Adult	14,1	14,7	12,6	13,8	16,4	20,1	26,0
Young	10,6	14,2	8,2	11,0	11,8	14,2	24,9
upper secondary plus postsecondary							
Adult	51,3	54,2	42,4	49,3	45,8	36,3	30,4
Young	47,0	49,9	39,6	45,5	42,3	39,4	36,7
Tertiary							
Adult	34,6	31,1	45,0	36,9	38,3	41,1	37,9
Young	42,4	35,9	52,3	43,5	45,9	46,9	40,0

Attainment difference from adult to young generation (percentage points, young minus adult)							
	AT	DE	CH	Av.appr	Av.EU22	Av.OECD	Av.G20
below upsec	-3,5	-0,4	-4,4	-2,8	-4,6	-5,9	-1,2
upsec, postsec	-4,3	-4,3	-2,9	-3,8	-3,5	3,1	6,4
Tert	7,8	4,7	7,3	6,6	7,6	5,8	2,1
5. Attainment structure change in the young (25-34y) population 2011–21							
Change of attainment percentages in young population over time (index, 2011 = 1)							
	AT	DE	CH	Av.appr	Av.EU22	Av.OECD	Av.G20
below upsec	0,88	1,08	0,68	0,88	0,73	0,74	0,75
upsec, postsec	0,88	0,84	0,79	0,84	0,89	0,90	0,98
Tert	1,22	1,30	1,37	1,30	1,27	1,24	1,30
6. Regional and gender attainment differences							
Range of tertiary attainment by subnational regions* (percentage, difference max-min)							
	AT (9)	DE (16)	CH (7)	Av.appr	Av.EU22	Av.OECD	AV.G20
Min	28,6	23,5	39,4	30,5	29,6	28,2	27,1
Max	45,0	45,0	56,0	48,7	50,4	49,2	50,4
DIFF	16,4	21,5	16,6	18,2	20,8	21,0	23,3
*number of regions recorded in brackets							
Female attainment in young generation compared to total attainment (index, total young generation = 1)							
	AT	DE	CH	Av.appr	Av.EU22	Av.OECD	Av.G20
below upsec	0,93	0,91	1,01	0,95	0,84	0,87	0,96
upsec, postsec	0,92	0,99	0,95	0,95	0,87	0,88	0,92
Tert	1,10	1,05	1,04	1,06	1,16	1,14	1,09

AT = Austria, DE = Germany, CH=Switzerland; Av.appr = average of the three countries AT, DE, CH; Av. = average; upsec = upper secondary education, postsec = postsecondary non-tertiary education, tert = tertiary education; min = minimum, max = maximum, DIFF = difference. Source: own table, calculations based on [23].

Table 1. Education structures in Austria, Germany, and Switzerland compared to EU22, OECD, and G20 average.

of doctorates is markedly more frequent than in OECD and EU22. Among the individual apprenticeship countries tertiary education is below OECD and EU averages in Austria (like G20) with a tendency towards the lower end of tertiary education (postsecondary and short cycle); in Switzerland, on the opposite, tertiary education is near/above the averages with a tendency to the high end (doctorates); and Germany counts in between with a slight tendency to the high end (doctorates). The distribution of fields of study shows in the apprenticeship countries first consistently higher proportions of engineering etc. and lower proportions of humanities etc., second more similar structures in Austria and Germany in three fields (engineering, humanities, health), third some specific constellations in Switzerland (higher proportions of similar size in the three

fields of health, business, engineering, etc.) and in Austria (lower proportions in ICT and natural sciences), fourth a most diverse constellation in the education studies field (higher proportion in Germany, lower in Austria, and very low in Switzerland).

- Is the strong upper secondary structure related to a slower dynamic of change in basic education structures between generations or over time? Taking the comparisons of change of attainment over generations and of the young generation over time grossly together, the rough observations do neither indicate that strong apprenticeship structures might hold back tertiarization, nor that they might prevent exclusion from upper secondary education; the proportion of upper secondary educated does also decrease in apprenticeship countries.
- How much do the basic education structures differ among the three dual apprenticeship countries in comparison to the broader aggregates? Regional disparities in tertiary attainment might be smaller in apprenticeship countries than at OECD, EU22, and G20 averages; however, gender disparities might be less favorable for females in apprenticeship countries, concerning both tertiary education and below upper secondary education.

In sum, the comparison of overall education structures gives quite small differences between the paradigmatic apprenticeship countries to EU22, OECD, and G20 averages. The overall structure of educational attainment gives mixed results, the current cross-section of the adult population shows higher attainment of upper secondary education, and lower attainment of both higher education and below upper secondary education. The dynamic in the younger generation runs toward higher education; however, does not show comparatively favorable results for the below-upper-secondary educated. The comparison of the individual apprenticeship countries shows some differences, with a more favorable position of Switzerland and a less favorable position of Austria, and Germany in between.

2.2 Apprenticeship and youth unemployment – which relationship?

The most established advantage of apprenticeship systems is access to employment and low unemployment; this is shown in various ways [14, 24]. However, at a second look, several questions emerge about the mechanisms that cause this relationship between apprenticeship and low unemployment.

One aspect that is often overlooked concerns the definition of unemployment. In political discourses mostly the statistical artifact of the unemployment *rate* is used that relates unemployed persons to the labor force. This indicator is often confused with the *proportion* of unemployed persons in the youth population. Because the labor force makes up only some part of the youth population (and with an increasing stay in education this part declines), and young people in formal (school) education are mostly not counted as labor force (because they do not fulfill the criteria of availability for employment), the unemployment *rate* is often much higher than the *proportion* of unemployed young people to the whole youth population (empirically the unemployment rate is mostly about double the proportion of unemployed among young people) – thus the confusion of the unemployment rate with the proportion makes look youth unemployment numerically much higher than it really is by the proportion indicator.

Because apprentices in traditional systems are – different to school students – mostly counted as part of the labor force, the measurement base of the proportion is endemically higher and might make unemployment rates look lower. This *employment relation* as a necessary part of quality apprenticeships constitutes a quasi-automatic contact between young people and employers, that can automatically easily explain the better employment prospects of apprentices. Beside the learning opportunities of young people and their productive contribution employers have also the opportunity of a more intense screening of their apprentices as potential employees, compared to young people from school directly applying for a job on the external labor market. In this structure the better employment opportunities are not primarily constituted by the educational qualities and outcomes of apprenticeship but by the automatically included employment relation.

Several studies have shown that the relationship between apprenticeship and youth unemployment is not so easy and straightforward [24]. Among eight countries with regulated and established apprenticeship systems in the 2010s, only the three analyzed in this chapter (Austria, Germany, Switzerland) are ranked at the low end of registered youth unemployment, two countries (Italy, Ireland) rank even at the high end of youth unemployment.

More detailed analyses of youth unemployment by the regional political administrative units (*Länder*) in Austria [25] show some indications that a higher access rate to apprenticeship is slightly correlated with lower regional youth unemployment; however, this relation holds also with total unemployment (a causal interpretation would imply that the inflow in apprenticeship would reduce total unemployment – a completely stupid idea). The conclusion about this spurious correlation is that there must be various other economic and social factors that intermediate between the amount of regional establishment of apprenticeships and the employment or unemployment situation. The marked regional differences in access to apprenticeship, and thus the varying degree of the regional establishment of apprenticeship within the country is one of the factors that deserves an explanation.

2.3 The role of labor market development and policy in apprenticeship

The overall economic and labor market conditions are twofold important for the situation in apprenticeship because the youth labor market is part of the overall labor market. That means first that positive general economic conditions and dynamics provide positive conditions for the youth labor market and apprenticeship as part of it. Second, it is well known that the reactivity of the youth labor market to the economic ups and downs is high, thus economic stagnation or downturn has quite immediate negative consequences for the apprenticeship. Thus, the most important asset of apprenticeship is the most vulnerable to external conditions. This can explain, why governance and policy factors receive so much attention in the concept of quality apprenticeship.

To demonstrate these problems, the changes in youth unemployment over time can be compared to overall unemployment, and the attempts of influencing the youth labor market through labor market policy measures can be observed. Indeed, youth unemployment is over time strongly related to overall unemployment. Previous analyses [26] about the period 1999 to 2011 have shown that in the selected apprenticeship countries both indicators, adult and youth unemployment show a similar development compared to the European average of these indicators. Adult and youth unemployment *both moved almost identically* in a range between 40 and 60 percent of EU average in

Austria and Switzerland. This perspective does neither indicate a structural reduction of the youth unemployment level compared to adults, nor a different change over time. Only Germany shows a different picture. In this country, youth unemployment with a range between 40 and 90 percent of EU average differs from the level of adult unemployment with a range between 60 and 140 percent of EU average. In this country, the level of youth unemployment is substantially lower in comparison to EU average than that of adult unemployment, however, compared to Austria and Switzerland the German level of youth unemployment is at the same time markedly higher, and over time adult unemployment shows a more favorable development than youth unemployment within this country. In sum, these comparisons do not reinforce the expectations about a visible and robust relative reduction of youth unemployment in apprenticeship countries over the time of the “great recession” in the late 2000s.

Because of the employment relation of apprenticeship, this sector is included in industrial relations and social insurance systems, including unemployment insurance. This inclusion of apprenticeship into social and labor market policy is particularly institutionalized to a high degree in Austria. Since the coincidence of the high demographic supply of young people with an economic downturn in the early 1980s massive interventions in the youth labor market have been sustained under a high cross-party political consensus. These labor market policy interventions included *four kinds of measures*,

- first massive support for the provision of apprenticeships by firms,
- second much regulatory easing of apprenticeship provisions,
- third the creation of a kind of institutional apprenticeship organized by adult education providers and financed by labor market policy,
- and finally the provision of a broad supply of labor market policy measures for young people not finding access to apprenticeships.

Austrian evaluations show temporary very high rates of inclusion of young people in labor market policy measures [26], regionally up to five in ten young people seeking support from the public employment service, and up to one in four enrolled in labor market policy measures. The OECD labor market policy database reinforces evidence of such strong interventions in the apprenticeship market. During the 2007–08 recession years, 14 percent of total labor market policy funds were spent only for apprenticeships, and 20 percent of all supported persons were enrolled in these measures. The OECD data, however, do not show a similarly high incidence of support for apprenticeship in labor market policy. In Switzerland lack of data undermines comparison, and Germany shows a similar incidence to Austria in the years before the recession (2004–05), but not a similar strong increase of measures during the crisis. Interestingly, the public discourse about the pros and cons of apprenticeship in Austria, highly driven by interest organizations, does insistently ignore this aspect of the impact of labor market policy for sustaining apprenticeship.

2.4 Positioning and structures of apprenticeship in the trilogy countries

This section goes deeper into two aspects, first how VET is positioned within educational participation in the trilogy countries compared to a broader set of OECD

countries, and second how the trilogy countries differ from each other concerning their structure of apprenticeship measured by available financing, skills, and recruitment indicators.

In the three selected countries participation in vocational education at the upper secondary level is at the high end of OECD countries, between 60 percent and 70 percent of age groups, with positioning of vocational participation not at the first ranks, but in a range of 5 to 10 among 36 countries. Austria differs by an earlier start of vocational education, with 41 percent already enrolled at age 15 according to the Programme for International Student Assessment (PISA) study, compared to 6 percent in Switzerland (and no information in this data source for Germany).

Previous versions of the OECD education indicators [27] have provided age-specific information about interrelationships of the positioning states of education, employment, unemployment, and out-of-labor-force (non-employment) among young people, that are normally observed as distinct states; this indicator also allows to identify apprenticeship-like states (work-study programs). Two age groups of young people are distinguished that indicate upper secondary (15–19 years) and tertiary (20–24 years) education (in current versions of the OECD indicators the distinction of age groups is not documented anymore, so such a detailed update is not possible [23]).

Grossly over both age groups, this indicator identifies overall participation in education between 85 percent and 90 percent on average and without much difference among the three apprenticeship countries, with participation going down in the older age group to a range around 45 percent, with lower participation in Austria (only 34 percent). Participation in definite apprenticeship programs is small on the OECD average (going gradually down from the younger to the older age group from 5 percent to 1 percent). The trilogy apprenticeship countries show a characteristic pattern that is not so commonly considered. In Germany, this proportion of participation in apprenticeship is similar in the younger and older age group (meaning that in this country participation in apprenticeship programs is similar among young people in the upper secondary level age group to the postsecondary-tertiary level age group); in Austria apprenticeship is mostly concentrated in the younger upper secondary related age group and very small in the older tertiary related age group; and in Switzerland the proportion of apprentices is comparatively highest in both age groups with a higher proportion in the younger upper secondary related age group.

The overall proportion of *interrelated education-employment-unemployment status positions* that indicate the complexity of education and (un)-employment careers, increases gradually by age groups from one-fourth to one-third. The biggest category among the interrelated status positions is in both age groups the combination of *education and employment* other than definite apprenticeships that might indicate the demand for employment experience among students. The proportion of interrelated status positions is about 10 percentage points smaller in the apprenticeship countries in both age groups; only in Switzerland, the interrelation of education and employment is higher in the older tertiary-related age group in Switzerland (indicating the incidence of higher professional credentials acquired by certification based on exams beside employment).

An interesting information in this table about interrelated status positions that adds to the above discussion of unemployment indicators is the interrelation of *education and unemployment*, indicating that unemployment is not always distinct from education. This position is low at the OECD average (1-to-2 percent), however, goes up to 5-to-10 percent of young people in some countries (e.g., UK, Netherlands, Denmark,

Sweden, Finland, and together in the Nordic countries), and is often a bit higher in the younger upper secondary related age group. Among the trilogy countries this interrelated proportion is very low (at 1 percent), and only a bit higher in the younger upper secondary-related age group in Switzerland. This status position might reinforce the demand among young people for seeking employment experiences besides education.

These patterns of interrelated status positions might be interpreted in two ways, first as signs of the demand for employment experience during studies, and second as a tendency of a drift of apprenticeship programs from only the secondary level to the tertiary level (e.g., the establishment of “higher vocational” education at tertiary level is a main issue in Austrian education policy indicating an interest to elevate vocational education from the lowest end of the education hierarchy).

The following reasoning and analysis look in more detail into the financing, skills, and recruitment of apprenticeships in the trilogy countries. Different structures and practices of dual apprenticeship in the three countries have become visible through the analysis of the financing of this sector of VET since the 1990s. Because the financing of apprenticeship includes a complex set of elements (apprentices wages, their productivity, training time, engagement of firm’s workers in instruction, training personnel and infrastructure, etc.) the analysis of financing indirectly discloses much information about how a system works. In Germany and Switzerland, four waves of detailed studies about costs and returns of apprenticeship were conducted during recent decades. Austria has only marginally participated in this research; after the first systematic study comparing Austrian practices with German research results in the mid-1990s (see a summary of results and references in [16]), Austrian stakeholders hesitated to take part in this comparative endeavor – only recently some comparative results are available from 2016 [28].

The first comparison [16] gave substantial differences between Austrian and German apprenticeships that indicate the wide range of possible forms of enactment of such a system. In fact, despite a similar institutional framework, the two systems represent different worlds of dual apprenticeship. In a nutshell, the Austrian structure and practices represented a world of small or very small training enterprises in which the apprentices predominantly performed simple productive work supervised by fellow workers who performed their work tasks without losses of their productivity; in terms of financing this structure provided comparatively high apprentices wages (compensating for productivity) and minimal training personnel and infrastructure; on average, firms provided small net costs. The German apprenticeship world represented a world of large enterprises that provided a substantial training infrastructure with employed personal and material provisions. Of course, in both predominant worlds, the shadow of the opposite world also existed, and some sectors are situated in between these worlds; besides, because of the wide distribution of apprenticeship training among enterprises in different economic sectors and with different economic performances a high degree of heterogeneity/diversity of practices must be expected (e.g., apprentices are trained in world-renowned restaurants as well as in the existentially struggling tavern around the corner; the same dispersion can be found in other trades). This diversity is also reflected in the wide distributions of cost-benefit-relations within trades; at the time of the first studies, 33–40% of enterprises reaped net benefits in Austria, whereas this proportion was about two-thirds in Switzerland ([16], p. 166). In Austria the big majority of apprentices were trained alone in their firm (50%) or with only one colleague (a further 20%); only for a minority, continuous recruitment and training process took place, and only 5% experienced training in bigger groups of 10 colleagues or more. “In Austria, 60% of training enterprises

provided mere on-the-job-training without any specific investment in the training process. In those cases, the trainers do not even report any reduction in their productive capacity for training. Among the remaining 40% of enterprises, which invest in some infrastructure, about 30% report some reduction of the productive capacity of trainers through their supervision activities, and the remaining 10% of enterprises invest in some infrastructure, that is full-time instructors or some material investments, as workshops and the like” ([16], p. 166).

These differences are reflected in the cost-benefit relations of financing. In Germany expenditure for full-time trainers was more than threefold compared to Austria, expenditure for part-time trainers and infrastructure was about double (only apprentices’ wages were about 20 percent lower in Germany, diminishing to some extent the difference in gross expenditure that was about 30 percent higher in Germany) [29]. More recent comparative information about financial indicators is available from [28, 30], summarized in **Tables 2** and **3**. Substantial differences between the three countries of comparison are reinforced by this information.

The published information about financial indicators is not very strictly comparable; gross costs depend on wage levels and purchasing power that is not controlled, and surveys from different years for different countries were used (for Austria the

		Long (3,5-to-4y) programs 2009–16				Medium (3y) programs (2012–16)			
		Percentage of GROSS COST		Yrs. 1-to-3 INDEX		Percentage of GROSS COST		Yrs. 1-to-3 INDEX	
		%net cost	%return	net cost	gross cost	%net cost	%return	net cost	gross cost
AT	2016								
	1st y	-13%	87%	1,00	1,00	-5%	95%	1,00	1,00
	2nd y	-10%	86%	0,82	1,13	-10%	90%	2,06	1,14
	3rd y	-17%	83%	1,73	1,34	-13%	87%	3,32	1,36
	av.	-13%	85%			-10%	90%		
DE	2012–13								
	1st y	-65%	35%	1,00	1,00	-32%	68%	1,00	1,00
	2nd y	-51%	49%	0,79	1,01	-22%	78%	0,72	1,05
	3rd y	-36%	64%	0,58	1,05	-11%	89%	0,36	1,10
	av.	-51%	49%			-22%	78%		
CH	2009								
	1st y	-21%	79%	1,00	1,00	-1%	99%	1,00	1,00
	2nd y	-5%	95%	0,23	1,00	12%	112%	-16,35	1,01
	3rd y	13%	113%	-0,72	1,10	18%	118%	-28,22	1,18
	av.	-4%	96%			10%	110%		

AT = Austria, DE = Germany, CH=Switzerland; y = year; av. (bold numbers) = average across years of training (1st to 3rd year; 4th year omitted because of downward bias with 3,5 years; gross cost = all expenditure of firms for apprenticeship training; net cost = gross cost minus returns of apprentices’ productive contribution; index = costs in later years relative to 1st year. Source: own table, calculations based on information provided in [28, 30].

Table 2.
 Indicators of financing apprenticeship in Austria, Germany, and Switzerland for long and medium programs by training years, different dates 2009–16.

		RETENTION Percentage of apprentices employed 1 year after completion							INDEX recruitment costs/apprentice cost	
PRODUCTIVITY		Size of training enterprise (no. Employees)					INDEX	average	recr/gross	recr/net
		%prod. of qual.w	%qual. Tasks by appr.	<9	10to49	>50	large/small			
AT	1st y	26%	13%							
	2nd y	44%	25%							
	3rd y	67%	47%							
	av.	46%	28%	56%	59%	73%	1,30	63%	0,47	-4,71
DE	1st y	41%	27%							
	2nd y	59%	51%							
	3rd y	73%	64%							
	av.	58%	47%	49%	65%	79%	1,60	64%	0,59	-2,76
CH	1st y	37%	23%							
	2nd y	57%	46%							
	3rd y	74%	65%							
	av.	56%	45%	25%	32%	44%	1,76	34%	0,64	6,32

AT = Austria, DE = Germany, CH=Switzerland; y = year; av. (bold numbers) = average across years of training (1st to 3rd year), RETENTION only after last year; size of training enterprises indicated by number of employees; %prod. = percentage productivity, qual. w = qualified workers, %qual. = percentage qualified tasks, appr. = apprentice; INDEX large/small = ratio of ">50"/" < 9"; recr = recruitment cost; gross = average gross expenditure; net = average net costs/benefits (negative sign = costs, positive sign = benefits). Source: own table, calculations based on information provided in [28, 30].

Table 3. The productivity of apprentices and retention of apprenticeship completers by training enterprises in Austria, Germany, Switzerland, 2012–2016.

most recent information, 2016 is provided; for Germany, information from the early to mid-2010s, 2012 and 2015 is used, and for Switzerland the information stems from around 2010, 2009 and 2012), the currency was sometimes converted, sometimes not, the different years of observation imply effects from inflation. Moreover, the concrete technique of estimation of the multitude of elements included in the financing of apprenticeship might differ from study to study. This partly inconsistent use of information for comparisons in the literature mirrors the difficulties in the observation of financing of apprenticeships in comparison to other sectors of education (schools, higher education), and indicates the risk of biased conclusions based on spurious information even in high-quality publications. A closer look at this published information is justified if only the imponderability and uncertainty of established knowledge and “evidence” is disclosed and new questions for understanding are opened. Therefore, the comparison in the current chapter is based on the

calculation of relative indicators consistent within countries (percentages of returns and net costs/benefits in relation to gross expenditure; and relative indices between 1st to 3rd years of training), without comparing the absolute levels of expenditure. Besides measurement error, some ideas about basic patterns of different practices can be inferred from this information (**Table 2**):

- the index of gross expenditure by training years is consistent within the compared countries with much smaller variation in Germany and Switzerland compared to Austria; in Austria, gross costs are more than ten percent higher in the second year, and more than thirty percent higher in the third year compared to the first year, whereas in Germany and Switzerland, the gross costs in the second year are similar to the first year, and only between five and twenty percent higher in the third year (this pattern might be attributable to differences in the apprenticeship remuneration and to a more easy observation of gross costs)
- the index of net costs/benefits over training years varies much more strongly between countries and within countries, only Germany shows a consistent pattern with stepwise decreasing net costs from training year to training year, minus twenty to thirty percent in the second year and minus fifty to sixty percent in the third year; Austria shows a reverse tendency with increasing net costs from the first to the third training year and more marked differences between long and medium programs, net costs in the third year are two-to-three times higher in the third year compared to the first year; in Switzerland the differences between the two points of observation are bigger, and the pattern differs fundamentally from the two other countries by a reversal from net costs to net benefits in the third year at both observation points, and already in the second year in the later observation point. This pattern of the index of net costs/benefits over training years mirrors very different country-specific levels of returns, and consequently net costs as percentages of gross expenditure. The returns are always highest in Switzerland and rising from 100 percent the 110 percent of gross expenditure, in Austria the returns are between eighty and ninety percent of gross expenditure between the two other countries, and in Germany, the returns are lowest at both observation points and substantially higher at the second observation point of medium-length programs, eighty percent versus fifty percent. Switzerland shows an increase in the average level of returns and a turn from average net costs (4 percent of gross expenditure) to average net returns (10 percent of gross expenditure) between observation points and program length, over training years the returns consistently rise, and the net costs/benefits improve compared to the first year with consistent but decreasing net costs (from 20 percent of gross expenditure to almost break-even). Austria shows on average higher returns and lower net costs than Germany, and the pattern over training years is reversed with slightly decreasing returns from year to year and consequently rising net costs in parallel. In Germany, the levels of returns and net costs differ most strongly between observation points and program length, with the lowest returns (increasing with training years) and highest net costs (decreasing with training years).

Table 3 looks from a different angle on the practices of apprenticeship training mirrored by the financial analysis:

- The productivity indicators show first how surveyed stakeholders estimate the productivity of the productive contributions of apprentices compared to a fully

qualified worker, and second how the productive contributions of apprentices are performed through percentages of simple vs. qualified tasks. The productivity of apprentices is estimated in Austria at a lower level than in Germany and Switzerland (below fifty percent versus almost sixty percent), with a continuously rising tendency from training year to training year (from about thirty to forty percent to around seventy percent); however, remaining substantially below a qualified worker also in the last training year. The second indicator, the percentage of qualified tasks performed in productive work, is estimated substantially lower in Austria (below thirty percent on average) than in Germany and Switzerland (below fifty percent on average), with a stronger increase in the latter two countries from year to year. This pattern reinforces the initial comparison of Austria to Germany in the first financial research study described above with a substantially lower qualification status in the former country.

- The retention patterns by training enterprise size indicate the degree to which apprenticeship training successfully contributes to the qualification and personnel demand of training enterprises. Retention of completers 1 year after completion is substantially higher in Austria and Germany (two-thirds) than in Switzerland (one-third). Retention consistently increases with the size of the training enterprise, in Germany and Switzerland substantially more (by sixty to eighty percent) than in Austria (by thirty percent); in Austria retention is substantially higher also in the category of small enterprises, indicating that apprenticeship training is driven substantially by the firms' demand.
- Complex estimations of recruitment costs that consider wages and effort of recruitment personnel, duration of recruitment, and retention of recruited persons (see the Swiss example in [31], p. 15–16) reach quite high estimated figures that can be related to costs of apprenticeship. The reported recruitment costs are reported at about half to two-thirds of the gross expenditure of an apprentice. When this is correct, the savings from recruitment by apprenticeship might be quite substantial. Related to the net costs/benefits the recruitment costs make three to six times the costs/benefits (in Switzerland, the benefits from apprenticeship would on average finance one-sixth of additional recruitment costs, given that the apprentices are retained).

In sum, these observations underline first the difficulties of analyzing the enacted institutions and practices of dual apprenticeship. Across the board the simplistic and across the board comparatively low-qualified world of *Austrian* apprenticeship is underlined at several points of the analysis. The majority of apprentices individually perform simple work tasks without much input by trainers, being comparatively well remunerated by the yearly rising apprenticeship wage, and initially being retained in the training firm at least with a two-third probability; on the enterprise side, costs are comparatively low and returns high, with the apprenticeship wage compensating to some degree for high productive contributions and low qualifying inputs; because of the absence from the research endeavors, changes over time have not been observed, decreasing returns from the first to the third year, on the contrary to the two other compared countries, cannot be easily explained.

The two observations for *Germany* indicate substantial changes over a short time period or differences between programs of slightly different lengths (3 versus 3,5 years); because the longer programs make a small amount of highly qualified

apprenticeships, the differences are probably structural, with the standard 3-years programs providing higher returns and lower net costs related to the gross expenditure – thus the differences might indicate higher costs of infrastructure in the longer programs. Compared to Austria, several indications are found that corroborate the above-described differences from the early comparison in the 1990s: net costs in the standard programs are double, with lower returns from productive work except for the third year, and consistently a higher proportion of qualified tasks performed and in first and second year estimated productivity nearer to fully qualified workers. The initially different worlds of a higher qualified versus a lower qualified structure of apprenticeship might have been somewhat moderated in standard programs, but still seems very marked – maybe even more marked – in the longer, higher qualified programs.

Switzerland discloses its unique structures in these comparisons; for this country, the crisscrossing of time differences and different program lengths also applies, with much smaller differences between the two observation points. The unique result for Switzerland is first a shift from net costs to net benefits with very high returns to more qualified productive work in the later years of apprenticeship that is much more marked in the 3-year program in the second observation point (the net costs in the first year might be attributed to the third learning site of the Swiss sometimes called “trial” instead of “dual” apprenticeship-system [32]); furthermore, the retention of completers of apprenticeship is much lower than in both the other countries of comparison, that might be compensated by the average net returns.

The analyses in this section first indicate that the apprenticeship systems in Germany and Switzerland have already drifted well to the tertiary level without being classified in this way. In Germany, this drift is indicated by the changing age structure of apprentices towards the 20-to-25-years age group related to tertiary education and by the increasing access of young people with higher level credentials and partly or full eligibility to higher education into highly qualified apprenticeship programs. In Switzerland vocational and academic education has institutionally converged most markedly among the trilogy countries by the establishment of the opportunity to take the vocational baccalaureate (Berufsmaturität) in apprenticeship and by the creation of the universities of applied science (Fachhochschule) on top of apprenticeship; despite the still formally segmented structure, the Swiss education system appears much more integrated than the other two. Only in Austria, the drift towards tertiary education was taken over by parallel five-year upper level full-time VET institutions providing double qualifying credentials with labor market value and eligibility for higher education leading to a “dualistic” structure of apprenticeship and full-time VET institutions; until recently institutional convergence was also politically blocked by building the Fachhochschule on top of the fulltime VET-institutions and postponing a realistic opportunity for taking a vocational baccalaureate for apprentices for more than a decade – as a consequence, Austrian apprenticeship remained trapped at the lowest end of upper secondary education, unable to compete with the fulltime VET-institutions (for a more detailed description and analysis of these institutions see [21, 33]).

Second, the interrelations of education with employment and unemployment shown in the OECD transition data in addition to formal apprenticeships, particularly in the younger upper secondary related age group indicate a demand among young people for employment experience beneath school education. This demand can be met in various forms, not only by formal apprenticeship. However, well-shaped institutional solutions in favor of supporting young people’s experience and careers seem not so easy to find. One frequent solution is transitional labor market policy

programs (e.g., the German *Übergangssystem* transition system [34]) that seem across-the-board not very successful and may stigmatize young people and lead to unstable careers. Another form of a solution that is not policy-induced but practically emerging is *precarious work* beneath education or combined with the search for more stable employment opportunities; this form of combining education and work might have – beneath acquisition of work experience – adverse effects of postponing the completion of education and broader familiarization with precarity.

Third, the analysis of the data about financing apprenticeships shows the difficulties of producing sound evidence about these complex phenomena and the potential sources of variation in these systems. One is still the issue of exploitation of apprentices through unqualified work tasks by low-level enterprises that struggle in the market for economic survival by pressing down wages, etc. that cannot be easily disclosed by these data [35]; e.g., the causal differences between training firms that reap net benefits and firms that invest net costs for apprenticeship that appear in most occupations and sectors in parallel, are not well explained so far. In the early Austrian study, the main factor that could explain this difference was capacity utilization (*Auslastung*, [29]); this could mean that apprentices work is used in times of peak strain on resources (and hardly for educational purposes), and this might be interpreted as a sign for exploitation, as well as the high proportion of unqualified works tasks performed by apprentices in Austria. Another source of variation that has been disclosed already by the early comparison of Austria with Germany concerns the elaboration of instructional practices and the availability of personal and material resources for instruction. Thomas Deissinger [12], in his reasoning about the sustainability of dual apprenticeship systems with a strong focus on Germany, draws a basic distinction in such systems between apprenticeship (that means the practices in the training firm) and duality (that means the cooperation and coordination between the firm's activities and the parallel part-time school). Despite the strong political branding in Germany of the Dual System Deissinger ([12], p. 304) emphasizes the apprenticeship aspect and questions the duality aspect by pointing to “the uniqueness of the German apprenticeship system, which seems to be more of a strongly occupation-based system with a specific stakeholder configuration than a dual system”. In Switzerland much emphasis is laid on the issues of coordination and cooperation in the duality with the solution of creating a “third learning site” organized by various professional stakeholders beneath the training firms and the vocational school, and used flexibly in the various occupations and sectors with a focus on the early introductory instruction [32] – this solution might lead to a reduction of returns from the work of apprentices during the first year and the corresponding net costs in this time.

3. Conclusions and reflections

The analysis starts with a renewed interest in apprenticeship as a form of vocational education and training during more recent decades. The first important underlying question concerns approaches about how this form can be understood sufficiently to enact its potential for youth (and adult) education. Contrasted to a loose *modular* understanding of variants of apprenticeship practices focusing on work-based learning, more *holistic* approaches that construct complex structures of apprenticeship systems have gained influence in international or global political discourses. Such holistic approaches consist of a demanding configuration of a large set of interrelated elements concerning more basic economic, political, and

social structures (including e.g., corporatist governance, well-organized industrial relations, good wages and working conditions, multi-stakeholder participation, and the like). These holistic approaches towards apprenticeship systems owe much to the existing structures in the paradigmatic trilogy of apprenticeship countries of Austria, Germany, and Switzerland, that have sustained this form of vocational education and training over times of degradation and decline. Thus, a closer look at these structures and their similarities and – often neglected – differences can be justified.

The country-specific chapters in [36] have pointed to specific particularities in these countries. E.g., the tendency of firms in *Germany* to move out of the established public governance system towards Japan-like “segmentalism”; the “dualistic” structure of parallel full-time vocational schools and apprenticeship, and the situation of apprenticeship at the lowest end of the educational hierarchy in *Austria*; and the differentiation of higher level and lower-level sections of apprenticeship in *Switzerland*, implemented mainly through the creation of short 2-years programs beneath the established 3-and-4-year programs. In the current chapter, some aspects are more specifically compared, based on international comparative databases. Four research questions are explored through comparative data, first, whether the international data indicate influences of VET on the education structure through limiting participation in tertiary education or reducing exclusion towards low-level education; second, whether comparative data reinforce a reduction of youth unemployment through established apprenticeship systems; third, whether the employment relation in apprenticeship leads to a stronger involvement of labor market policy for young people; and fourth, how apprenticeship is positioned in the progression of educational pathways between upper secondary and tertiary education.

First, the educational attainment structures at lower, medium, and higher levels in the three countries are compared to international averages, in order to explore whether the apprenticeship countries show distinct attainment patterns and whether they display signs of reducing exclusion from qualified education or alternatively of withholding upgrading towards tertiary education, or both. The comparisons do neither indicate strong structural particularities nor clear structural advantages or disadvantages of the apprenticeship countries. Upgrading toward tertiary education is not withheld, and exclusion towards low-level education is not sustainably hindered. Among the three apprenticeship countries, Switzerland shows signs of both strong tertiary education and better inclusion at the low end; Austria shows signs of the most marked VET structure (strongest focus on upper secondary vocational education, less tertiary education, and less exclusion towards low-level education).

Second, a more detailed comparison of total and youth unemployment in the three countries relative to EU averages, and regional comparisons within Austria do not corroborate the common expectation that apprenticeship would relatively reduce youth unemployment. The often-cited difference between total and youth unemployment in Germany seems rather an artifact produced by the high total unemployment – youth unemployment was comparatively high in Germany compared to the other countries. Third the strong incidence of labor market policy interventions to fight problems in the youth labor market and support apprenticeship (particularly during the “great recession”) in Austria cannot be found in the two other countries – so the employment relation in apprenticeship does not generally induce a higher emphasis of labor market policy towards young people – the Austrian policies are rather induced by the high political consensus about consequently fighting youth unemployment

already since the 1980s. Fourth, within the educational participation structure, Germany and Switzerland show signs of a tendency of tertiarization of apprenticeship, whereas in Austria apprenticeship seems still trapped at the lowest end of the educational hierarchy.

In sum, still, the mechanisms through which the quality apprenticeship systems gain their impact are not very well known, and the question of how much the impact of apprenticeship is driven by the component of the employment relation, as compared to the education and learning component, remains to be answered by further research. Concerning the sustainability of apprenticeship two aspects are strongly emphasized in the literature, first its positioning in relation to the tertiarization of education and meritocratic competition perceived as strong drivers of educational development ([12], and other contributions in ref. [11]), and second the establishment and maintenance of strong corporatist institutional structures of holistic quality apprenticeships [6, 7, 28] that are commonly under pressure by current neoliberal and populist policies.

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