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REPORT ON RECENT CHANGES IN EUROPEAN EDUCATION SYSTEMS

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Rahvusvaheliste Sotsiaaluuringute Keskus (RASI) on Tallinna Ülikooli Ühiskonnateaduste Instituudi sotsiaalteaduslik interdistsiplinaarne teadus- ja arenduskeskus, mis teostab teadusprojekte. RASI teadurid on tegevad ekspertidena ühiskonnaelu analüüsimisel ja kujundamisel. TLÜ RASI uurimisteemad hõlmavad ühiskondliku ebavõrdsuse (või ka kihistumise) erinevaid tahke – sugu, rahvus, vanus, põlvkond, haridus, ametipositsioon. Viimastel aastatel on hakatud suurt tähelepanu pöörama elukestva õppe problemaatikale kui eluteed kujundavale ja sotsiaalset sidusust Eestis ning laiemalt kogu Euroopa Liidus tagavale tegurile. Teine uuem temaatika osakonna uurimistöös on seotud aktiivse vananemise küsimustega.

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Introduction

Technological change will have a profound impact on the world of work, and this change will affect job availability, the task composition of jobs and the skills required in the labour market. The drive towards higher-level (general and vocational) knowledge, skills and competences has become a dominant policy narrative at the European level in recent years. This quest for higher knowledge, skills and competences is supported by the European Union policy, particularly by the Europe 2020 strategy (EC, 2010).

While the risks of automation to destroy or substantially change jobs are widely discussed, estimates of its impact are subject of considerable uncertainty (Frey & Osborne, 2013; Cedefop, 2016; Eurofound, 2016; Arntz, Gregory, & Zierahn, 2016 etc.). One common conclusion is that jobs with the highest automation risk are those with more routine tasks and that job growth is expected in areas where more advanced cognitive and non-cognitive skills are required. The OECD Sills Outlook 2017 highlights the growing importance of skill mixes (OECD, 2017). The right skill mix would include string of general cognitive skills (like literacy and numeracy), which can provide a solid foundation to pursue lifelong learning. It also includes ICT skills, analytical skills and a range of complementary skills (creativity, problemsolving, critical thinking, interpersonal and communication skills etc.). These developments have generated labour market polarisation but also constitute a major challenge for education and training systems as the jobs destroyed and those created require very different sets of skills.

Due to technological changes, the role of educational systems in providing skills may change fundamentally in two main ways. First, whereas the emphasis of educational systems traditionally remains with initial education (in primary, secondary, and tertiary education), fast-changing skill demands may call for a vision of educational systems that allow more lifelong learning. As a result, the lines between the realm of initial schooling and all other education will blur. Although many scholars are working on conceptualizing educational systems (Bol & van de Werfhorst, 2011; Garrouste, 2010), current scholarship is largely restricted to initial education.

Second, educational systems usually clearly distinguish between general and vocational education, both in secondary and in post-secondary and tertiary education. In general academic tracks, the emphasis lies on teaching general academic skills, whereas vocational education emphasizes occupationally specific skills. This strong distinction may soon be outdated, as changing skill demands may also require more general skills (like creative problem solving and learning ability) in jobs that are still highly occupationally specific, and jobs with a high degree of dexterity/specificity may disappear (Brockmann, Clarke, & Winch, 2008). Jobs today are not as narrowly prescribed compared with the past, they require more flexibility and are more service-oriented, which makes information and social skills increasingly significant (Gibb & Curtin, 2004). Increasing importance of generic skills may alter the effectiveness of vocational education and training (VET) systems which depends on the connection of high level academic and specific knowledge in order to solve complex problems (Streeck, 1992). Very few studies have focused on the consequences of technological innovations on the relationship between general and vocational education.

The increased need for general skills is a major driver of the expansion of upper-secondary and higher education, which in many countries has led to a blurring of the traditional clear borderlines between VET and general and higher education as well as between initial and further education and training (Bosch & Charest, 2010). However, differences in educational systems may have an impact on technological change and its consequences for job structures and job task profiles.

Increasing importance of adult education and the provision of general skills in VET are the two major challenges to educational systems in times of technological change. However, there is a certain degree of substitution between the two: if a VET system is designed to provide also strong general skills there is less need for adult education (as general skills allow workers to train themselves and adapt to rapid changes). To the contrary, a VET system that does not provide an adequate amount of general skills may require a larger amount of adult education to allow workers to cope with technological changes.

This literature review provides a description of country differences in educational systems (paying special attention to vocational, tertiary/higher and adult education and training) and of major changes and policy debates in recent years. The special attention is payed to the research and policy implications in the context of technological change.

The literature review begins with the description of skill formation and typologies of (adult) education and training systems. Existing literature has demonstrated large country variations in how institutional characteristics shape participation in education and training (e.g. Saar & Helemäe, 2008; Roosmaa & Saar, 2010; Blossfeld et al., 2014; Desjardins, 2017). Thus, countries with different skill formation systems, but similar labour market and education systems could yield different patterns of education and training participation. This means that institutions comprise mutually interdependent and complementary country-specific “packages” (Blossfeld, 2003). Next, the review describes vocational education and training, higher education and adult education and training with the focus on returns to skills acquired and recent developments and policy debates. In the chapters on vocational and adult education and training, skill formation is discussed in further detail. While chapter on higher education gives an overview of diversification and vocational and academic drift in higher education. The literature review ends with concluding remarks.

1. Skill formation

Becker's (1962) human capital theory makes a distinction between *general and specific skills*[1] . General skills refer to skills that are acquired typically at school and are transferrable across different employers and occupations. Specific or firms-specific skills are usually acquired at the workplace and they raise the productivity of the employee only within the current company (Asplund, 2004), therefore these skills are less or not portable and consequently no poaching is involved. Becker (1962) argues that employers are willing to cover the cost of the training for these reasons. Because of the transferability of general skills to other companies, it is stated that employers do not have incentives to invest in general skills and that the cost will be borne by the employee. However, previous research has found that employers are actually willing to finance also the attainment of general skills, because in real work-life the employers do not have the knowledge about the skills that are taught to the employees in the competitive companies, so there is less fear that the trained employees are hired away to other companies (Bills & Hodson, 2007). In addition, there are incentives to the provision of general skills because the current employer can also benefit from it (Loewenstein & Spletzer, 1999). Moreover, contrary to the human capital theory assumption, labour markets are not perfectly competitive due to segmentation and the role of labour market and welfare state institutions and regulations.

For individuals as well as employers, general skills do not become obsolete with technological change and can contribute to a faster uptake of new technology (Krueger & Kumar, 2004). Still, there has been some discussion about the general and specific skills distinction itself and that there is not a clear way to indicate which skills are transferable and which are not (Bills & Hodson, 2007). According to Loewenstein and Spletzer (1999) most of the on-the-job training is in fact general and that it is difficult to point out some good examples of training that provide specific skills that are only useful for one employer. Bills and Hodson (2007) conclude that perhaps the skill transferability for that reason should be thought about rather along a general to specific continuum, as opposed to a clear distinction of these two categories.

There are different views on how technological innovation will change the labour market (see Brown & Keep, 2018[2]), but there is more consensus about the changing nature and types of skills required from the employees (Oliver, Yu, & Buchanan, 2019). Growing service sector with a focus on human interaction and technological changes rise the need for soft skills (presentation and attitude) and generic skills which enable to adapt to changing circumstances (Grugulis, Warhurst, & Keep, 2004). However, Oliver et al. (2019) indicate that according to some authors soft and

[1] It should be noted that terms "general" and "specific" skills are analytical tools applied to understand the process of skill formation, but particularly in case of work-based training, no skills are fully general or fully specific.
[2] Brown and Keep (2018) outline three broad perspectives regarding expected future directions on the labour market and respective types of skill requirements: labour scarcity (increased need for employees with advanced skills), job scarcity (increased demand for high skills and decreased demand for low skills; redesign of existing jobs), and the end of work ("technological unemployment", no need for increasing employability, learning should rather provide wider social, cultural and citizenship related knowledge and skills – individual growth (e.g. learning to learn, communication, problem solving, teamwork)).

generic skills will not replace the need for specific (occupational) skills but complement them (Bosch & Charest, 2010; Buchanan et al., 2001; Mournier, 2001; Wheelahan, Buchanan, & Yu, 2015).

1.1 Skill formation systems typology

Skill formation typologies emphasise the role of labour market and economic institutions in the generation of knowledge and skills and discuss the strain on companies to train employees. According to this approach, variations in skill formation systems tend to be in line with the skill requirements of national economies (Saar & Ure, 2013).

Ashton, Sung, & Turbin (2000) propose that to grasp the process of skill formation it is important to study the interconnections between the state (political elite and state apparatus), the education and training systems that provide the knowledge and skills; capital, i.e. companies creating the demand for skills; and the employees and their organisations that shape the skill supply. Ashton et al. (2000) identify four models of skill formation: the market model (the UK, the USA, Canada, etc.); the corporatist model (Germany, Austria, Switzerland, Denmark, etc.); the developmental state model (Japan, Singapore, South Korea); and the neomarket model (Chile, Mexico, Brazil) (for further detail, see Table 2a, Appendix).

Research on CEE countries implies that skill formation typologies should also consider market liberalism and market flexibility (Saar, Unt, & Kogan, 2008). Saar & Ure (2013) propose that Baltic countries share some characteristics of the market and neo-market model, whereas the Visegrad countries (the Czech Republic, Hungary, Poland and Slovakia) partly resemble corporatist and neo-market models.

1.2 Institutionalist perspective on skill formation

Scott and Meyer (1994), notable contributors to this perspective, have studied the US education system in applying similar notions as proposed by Archer (1979) in a seminal work on the social origins of educational systems (see here “Typologies based on educational perspectives”, p. 9). The parallel between the two approaches is especially evident when the former engage with the notions of fragmentation, centralization and bureaucratization in their analysis of the US educational system organisation.

Building on the political economy tradition, Thelen (2004) compared skill formation in Germany, Britain, the US and Japan. Her main thesis is that variations in national skill formation and workplace-based training emerge because of differences in the “coalitional alignments” between companies in skill-intensive industries, traditional artisans and early trade unions. Thus, the focus is on institutional evolution and historical changes, which can be assigned to the path dependency perspectives (Saar & Ure, 2013). According to Thelen (2004), studying institutional evolution enables to consider changes that at first glance might seem of minor importance but can obtain more relevance when related to similar occurrences over a longer time period. Busemeyer and Trampusch (2012) follow similar strain of thought in their contribution on the political economy of collective skill formation (see here p. 16).

2. Typologies of (adult) education and training systems

In the following, we present an overview on the existing typologies of (adult) education and training systems based on a Saar and Ure (2013). The typologies indicate how different dimensions of education systems, labour markets and welfare states are combined which explains the differences in adult education and training or in more broader terms lifelong learning systems. Saar and Ure (2013) argue that in order to avoid assumption of a single economic trajectory for market economies and their lifelong learning systems there is a need for multiple typologies.

2.1 Typologies based on educational perspectives

In analysing how education systems develop and change over time, Archer (1979) distinguishes between centralised education systems (France, Soviet period Russia) and decentralised systems (England, Denmark). In this typology, the emergence of education systems is described by "systematization" and "unification", but also by "differentiation" and "specialization", from those parings Archer regards the latter weaker in the sense that it has to give precedence to the first pair. Systematization and unification denote central or national level administration of educational establishments, activities and personnel. While differentiation relates to different services that are expected from education by various social groups (expressed by organised interests).

One of more extensively applied typology of education systems developed by Allmendinger (1989) centres around the criteria of standardisation and stratification. Müller and Shavit (1998) add the degree of occupational specificity as a further relevant dimension. Standardisation refers to the quality of education and to what degree it meets the same standards within a country (similar to Archer's concept of systematisation). Stratification refers to the extent and form of tracking into general and vocational strands in the education system. Occupational specificity denotes the degree to which training provides specific occupation-related knowledge and skills as compared to more general ones (see also Müller & Jacob, 2008). In addition, it is important to distinguish the extent to which there are direct links between the education system and employers (similar to Archer's notion about differentiation). All these dimensions are closely interlinked (see Breen, 2005).

The role of stratification regarding adult education and training is described in the chapter on skill formation in AET, but here also the role of standardisation should be specified. Namely, standardisation can facilitate adequate job-person matches, and in addition, for employers there is less need for providing additional training, because it is more feasible to recruit from the external labour market (as opposed to from within the company) (Müller & Gangl, 2003). Nevertheless, standardisation should lead to more flexible educational paths and promote learning and training among adults (Saar & Ure, 2013).

2.2 Typologies based on labour market perspectives

Another strand of literature comes from the labour market structure and organisation research. Typologies described here concentrate on the links between the educational, organisational and the domain of industrial relations (Ashton, Sung, & Turbin, 2000).

Skill acquisition is found to be different between occupational and internal models or between qualificational and organisational labour markets (Marsden, 1986, 1990; Maurice, Sellier, & Silvestre, 1986). The main point of these typologies is about the link between provision of training by the education system and skills that are recognised by the labour market. Thus, in the so-called organisational space, skills and knowledge acquired in the education system are rather general/academic (i.e. transferrable) and therefore occupationspecific skills are obtained later, via on-the-job training (Doeringer & Piore 1971). Accordingly, in a system of organisational space, participation in AET should be high. On the contrary, in qualificational space, skills and knowledge acquired in the education system are closely linked to labour market needs and are obtained in vocational education, hence the bulk of skills on the labour market is occupation-specific[3] . Educational systems with a high level of vocational specificity complement occupationally segmented labour markets (OLM). On the other hand, in countries where the general type of education predominates, intra-firm or internal labour market (ILM) structures are more prevalent. Typically, France is classified as an ILM country and Germany as OLM country. However, based on previous studies, countries such as Austria, Denmark, Switzerland and the Netherlands could also be characterised by OLM type and the remaining Western European countries also lean towards ILM type (for more detailed discussion about the position of Southern European and CEE countries, but also the UK, see Saar & Ure, 2013, p. 53).

2.3 Typologies based on the role of the formal education system, labour market and the state

Stemming from the educationalist perspective, Green (1999) proposes a distinction of five primary models of education and training systems (ETS). The typology of ETS is based on the interaction between central governments, education systems, labour markets and firms: the *Japanese* or *state developmentalist model* (incl. also South Korea, Taiwan, Singapore); *the German model* (Austria, Switzerland, the Netherlands, Czech Rep, Slovak Rep, Hungary, Slovenia[4]); *the French model* ("Latin rim" states, Bulgaria, Romania); the Swedish model (other Nordic countries); and *the UK model* (England, Wales, Baltic countries). In the Japanese model education and training systems are highly centralised[5] and general secondary education predominates vocational education. By contrast, German ETS is dominated by the dual apprenticeship system and is organised on a regional basis. The French model is highly centralised and based on comprehensive compulsory education with mainly school-based upper-secondary education with small share of apprenticeship system. The Swedish model is similar to the French in terms of comprehensive compulsory education and school-based post-compulsory education. In Sweden and other Nordic countries, apprenticeship is organised in schools. The UK

[3] However, this should also hold for other systems, if occupation-specific skills are obtained after initial education.
[4] Saar & Ure (2013) have added respective CEE countries to the typology.
[5] Compare with the notions of systematisation and unification by Archer (1979).

model is relatively decentralised, with comprehensive compulsory education and post-compulsory education including both school and work-based teaching. However, Green (1999) observes that ETS in England and Wales has shifted more towards school-based organisation (see also Saar & Ure, 2013).

Later, Green (2006) differentiated between four models of lifelong learning systems, largely based on the earlier ETS typology, but with a focus on Western European countries and based on the observation that CEE countries are still in the stage of transformation. This typology adopts three dimensions of lifelong learning: the overall output of skills for the labour market; the distribution of these skills; and the level of participation in adult learning. For detailed characterisation of the ETS and lifelong learning systems, see Table 1a, Appendix.

3. Vocational education and training

Secondary education plays a dual role in today's education systems: firstly, it serves as a platform for all young people to develop skills and knowledge that are needed in the knowledge economy and secondly it provides young people with qualifications for the labour market and further learning (Sahlberg, 2007). The organisation of upper-secondary education differs strongly across countries. More specifically, in terms of their vocational education and training (VET) systems and institutional arrangements (Bosch & Charest, 2008). Some provide vocational training in school-based programmes, while others offer a combination of school and work programs for example in dual systems (Iannelli & Raffe, 2007; Ryan, 2001; van de Werfhorst, 2011). Vocational education and training can play a fundamental role in improving the ability of a country to deal with rapidly changing labour market conditions. In addition to ensuring a smooth transition from school to work, vocational education should also provide strong basic skills to ameliorate any later disadvantages in life (Cedefop, 2018).

3.1 Skill formation in VET

In some systems, VET prepares students for very specific occupations, in other systems, vocational education is rather general, because it is aimed at teaching overall principles rather than specific skills (Shavit & Müller, 2000). Shavit and Müller (2000) have measured the occupational specificity with the number of occupational specialisations that are taught in vocational programs. On the one end, there are countries where most vocational education programmes are very general (e.g. Israel and the USA) and on the other end German-speaking countries and the Netherlands where VET offers specialised training for hundreds of occupations.

Based on Bills and Hodson (2007), the increasing need for more skilled workers is leaving a question open for discussion about what skills are actually needed in the future. Although changes in the labour market structure and technological changes require general skills, these changes do not diminish the demand for specific vocational skills (Rasmusson et al., 2018). Workers most likely need a combination of both types of skills to perform the tasks in their occupations (Muehlemann, 2019). Cedefop (2012a) forecast indicates a shift to more skillintensive jobs at all occupational levels and a greater need for skills such as independent problem-solving, planning, organisation and communication, as routine jobs are increasingly carried out by technology

(Cedefop, 2012a). Skilled jobs, which require workers to use cognitive skills (UKCES, 2014), and jobs that are characterised by non-routine tasks (Cedefop, 2012a) are more difficult to automate.

The need for general skills is increasing, but vocational programmes are not always adequately geared towards the provision of these skills (Fazekas & Mytna Kurekova, 2016). In fact, general subjects are not automatically perceived as an important part of VET (Aarkrog, 2019). Industrial restructuring and the reduction of "life-long jobs" require workers to acquire new skills during their careers to manage transitions within and across jobs (Cedefop, 2015). Literacy and numeracy are basic skills that provide a „foundation" for the development of other sets of skills (OECD, 2016, p. 17). The ability to learn required by job mobility, strongly depends on these basic skills (OECD, 2010). Hence, the potential lack of proficiency in numeracy and literacy skills of VET graduates can have serious consequences for their social and labour market integration (Cedefop, 2015).

Vocationally educated people generally have lower levels of literacy proficiency compared to those with general upper-secondary education (Cedefop, 2015). Especially apprenticeship systems (e.g. Switzerland and Germany) appear to struggle with delivering high-level general skills (Fazekas & Field, 2013) because the majority of the learning time is spent in the workplace (OECD, 2010). PIAAC data suggest that the literacy gap between vocational and general upper-secondary graduates is the highest in the Czech Republic, Denmark, Germany, France, the Netherlands and Finland, which partly reflects the countries' tradition of separate vocational and general tracks at upper-secondary level (Cedefop, 2015). Nevertheless, it is important to acknowledge that academically weaker students tend to choose vocational tracks (Brunello, 2007).

In the Bruges Communiqué, countries agreed to "ensure that key competences and career management skills are adequately integrated in the IVET (initial vocational education and training) curricula and that these can be acquired through training opportunities in CVET" (continuing vocational education and training) (CE/EC, 2010). Based on Cedefop (2015), it is indicated that in all countries, key competences are part of the IVET curricula as subject areas or integrated in vocational subjects and that they can also be implicitly integrated through work-based learning and other learning methods. It is argued that generic skills are best acquired when taught in a real-life and work context and that employers and workplaces have an important role to play in fostering and maintaining the generic skills of the workforce (Gibb & Curtin, 2004).

3.2 Typologies of VET systems

3.2.1 TYPOLOGY BASED ON THE EDUCATIONAL PROVISION

In comparative research, to characterise the differences of vocational systems, typologies of education and training systems have been developed. Some typologies focus on different models of educational *provision*. Based on post-compulsory vocational training arrangements, Furth (1985) identifies three models of provision: the *schooling model* that integrates most forms of the formal education system provisions (e.g. the USA, Canada, Japan); the *dual model* characterised by strong and advanced apprenticeship system (e.g. Germany, Austria,

Switzerland); and the *mixed model* where non-formal educational sector plays a more significant role (e.g. the UK). The typology of educational provision is closely related with the typology based on the *organisation of vocational training* (Blossfeld and Stockmann 1998/99; Shavit and Müller 1998). Also here, three types are distinguished: "*theoretical*" vocational training where teaching mostly occurs in schools (the Netherlands, Sweden); *a dual system* where teaching is organised both at school and at the workplace (Germany, Denmark); and *on-the-job training* (the US, the UK, Italy, Spain[6]).

Yet another typology based on educational provision proposed by Green (1991) distinguishes three models: the *employer-led model* providing work-based training (Germany); the *education-led model* were general and vocational training are provided in separate institutions (France, Italy); *education-led model* where general and vocational training are provided in the same institution (Sweden).

In the Central and Eastern European (CEE) countries, education systems are organised into tracks and are therefore similar to those of highly stratified German-speaking countries. However, in some CEE countries, links between the educational institutions and the labour market are weak and therefore rather resemble the moderately stratified systems of France and the UK (Saar, 2005).

Eichhorst, Rodríguez-Planas, Schmidl, & Zimmermann (2012) classify three distinct VET systems: school-based, dual apprenticeship system (combining school training with a firmbased approach) and informal-based training (where VET takes place in some cases).

Rauner (2006; as cited in Brockmann, Clarke & Winch, 2008) who describes different qualification strategies, distinguishes between VET systems which focus on education for a specific occupation (e.g. Germany, Switzerland and Austria) and VET systems which are aimed at the employability of individuals (the UK, the USA). In the first model, according to Olofsson and Panican (2017), VET is designed in partnerships with employers and trade unions combining theoretical knowledge and workplace learning. Instead, in second model, individuals enhance their employability through certification of competencies which are acquired either through work experience or courses in a modularised system.

3.2.2 TYPOLOGY BASED ON THE VARIETIES OF CAPITALISM APPROACH AND ITS EXTENSION

Some typologies are based on the varieties of capitalism (VoC), in which national economies are described as *liberal* (LME) or *coordinated market economies* (CME) (e.g. Hall & Soskice, 2001; Estevez-Abe, Iversen, & Soskice, 2001; Iversen & Stephens, 2008). The VoC approach builds on the idea of "institutional complementarities", meaning that there is interdependency between distinct production regimes, industrial relations, education institutions and social protection systems (Hall & Soskice, 2001). Hall and Soskice (2001) maintain that countries with a specific

[6] In the light of recent national reforms, Spanish vocational education and training should not be classified as on-the-job-training (see for example Souto-Otero & Ure, 2012).

type of coordination in one sphere of the economy should develop complementary practices in other spheres, too.

The LME type of countries (the UK, Ireland, the USA, Canada, Australia, New Zealand) rely on competitive markets in coordinating relations between companies and other actors, while in CME countries (Germany, Austria, Sweden, Norway, Finland, Denmark, Belgium, the Netherlands, Switzerland)[7] there is more strategic interaction between economic actors (see Table 3, Appendix). These two types of coordination lead to variations in skill formation: in LMEs, the education and training system concentrate on the development of general competences and skills, whereas in CMEs, the emphasis is on industry or occupation specific skills (Estévez-Abe et al., 2001). Hence, VoC builds on the human capital theory by showing how different skill formation regimes are positioned in certain institutional frameworks. VoC approach also explain how the social protection and production systems are interlinked (Estévez-Abe et al., 2001). Estévez-Abe et al. (2001) indicate that LMEs and CMEs protect investments in specific skills in different ways. In CMEs, employment protection and unemployment protection are incentives for workers to invest in specific skills. While, LMEs does not create any incentive with social protection for firms or employees to invest in industry-or firm-specific skills (Saar & Ure, 2013).

In terms of CEE countries, the VoC model does not include some significant characteristics of these countries, such as dependency on international companies and organisations such as the World Bank, the International Monetary Fund, etc. Accordingly, Nölke and Vliegenthart (2009) describe a dependent market economy (DME) type of capitalism found in the Visegrad countries. Bohle and Greskovits (2007) identify three types of capitalism emerging in CEE: a neoliberal type in the Baltics (a "thin" welfare state with very liberalized markets and an institutional framework supporting the market; closest to the UK and hence a LME or liberal type of DME), an embedded neoliberal type in the Visegrad countries (DME), and a neocorporatist type in Slovenia (with the relatively strong role of the state and specific corporatist elements; closest to Germany and Austria and thus a CME).

Critics of the VoC approach indicate that institutions might be less strictly connected with national innovation and production systems and therefore there could be incoherence (as opposed to complementarity) at both national and also sectoral or local levels (Crouch, Schröder, & Voelzkow, 2009). Wheelahan (2015) states that while VoC is useful to have an insight into the so-called "dominant tendency" of the structure of national economies and societies, it tends to homogenise the national systems, which makes it less helpful to understand the diversity within the systems.

Finegold (1999) uses the skills ecosystem approach, where the focus is on the employer's demand for skills. Finegold argues that skill ecosystems exist either at regional and/or at sectoral levels and high-skill ecosystems can exist in both liberal and coordinated market economies. The approach emphasises the connections between VET and other policy domains, similar to the VoC literature (Oliver et al., 2019), but also broadens the conceptualisation of VET by considering how

[7] For categorisation of countries under LME and CME type, see also Hall and Gingerich (2004) and Hall and Thelen (2009). According to Hall and Soskice (2001), it is difficult to categorise Southern European countries into LME or CME type.

skills are utilized and delivered by firms (Payne, 2008). Oliver et al. (2019) indicate that, along other institutional approaches, the skills ecosystem provides also information on why employers are often unwilling to invest in VET.

Comparative research suggest that VET is based on different models, reflecting the link between employment, education and the welfare regime (Busemeyer, 2015). Greinert (2005) makes the distinction of three classical VET models: the liberal market economy model (e.g. UK), the dual-corporatist model (e.g. Austria, Germany and Switzerland) and the stateregulated bureaucratic model (e.g. France). Olofsson and Panican (2017) discuss that the main difference between these three models is the degree of regulation regarding educational governance and the partnership arrangements between the state, employers and labour representatives.

Busemeyer and Trampusch (2019) indicate that the economic sphere of the labour market and the political-administrative arena are the main domains in which the politics of vocational training and skill formation take place and that there are three main actors: firms, employers and the state. Busemeyer and Trampusch (2012) research on the political economy of collective skill formation distinguish VET systems according to the degree of public commitment to vocational training and the involvement of firms in IVET, resulting in the distinction of static, collective, liberal and segmentalist skill formation systems. Busemeyer and Trampusch (2019) suggest that as the diversity of the system increases, also increased set of indicators for describing these systems are needed.

3.2.3 VET SYSTEMS FROM A LIFELONG LEARNING PERSPECTIVE

Cedefop (2019a) has analysed and classified continuous VET (CVET) systems from a lifelong learning perspective. CVET was considered to better foster lifelong learning with:

- Wider aims for CVET than only job-related;
- Increasing diversity of (types of) providers (including employers and IVET institutions);
- Diverse target group for initial (IVET) (including acknowledging the adult learners);
- Connection to work/educational path:
    - Easy access from IVET to higher education (vertical permeability, measured as VET graduates' participation rates in higher education);
    - Horizontal permeability of CVET system for IVET graduates (measured as VET graduates' participation rates in non-formal education and training).

Table 1 summarizes the results of the analysis about vertical and horizontal permeability of VET in different countries.

Table 1. Vertical and horizontal permeability of VET systems in countries

		Vertical permeability		
		High	**Medium**	**Low**
Horizontal permeability	**High**		The Netherlands	Bulgaria Romania

			Slovenia
Medium	Denmark	The Czech Republic Spain Portugal	Belgium Croatia Italy Greece Poland Slovakia
Low	Finland France Luxembourg Sweden The UK	Austria Germany	Cyprus Estonia Hungary Latvia Lithuania Malta

Source: Cedefop (2019a).

The permeability seems to be quite high in Denmark and the Netherlands. On the other hand, it is quite low in a range of Eastern European and Southern countries. The Baltic countries and Hungary together with Malta and Cyprus seem to have lowest vertical and horizontal permeability, so that the IVET graduates are less likely to continue studies in formal education or CVET. Nevertheless, Croatia, Poland and Slovakia – together with Italy, Greece, and Belgium – fare better in terms of horizontal permeability.

Bulgaria, Romania and Slovenia are Eastern European countries with rather high horizontal permeability, whereas their vocational upper-secondary graduates have continued their studies in higher education institutions more than average but their participation rate in nonformal education and training (NFE) is low.

The apprenticeship countries, like Austria and Germany, show relatively low chances for IVET graduatesto continue in formal education compared to other countries, but medium chances to participate in CVET.

Finland, France, Sweden, Luxembourg and the UK do show relatively high chances for IVET graduates to continue their formal education, but a lower than average likelihood to participate in non-formal education. The latter feature is difficult to explain observation, as (some of) the countries in this group tend to promote lifelong learning also in their VET system. However, if VET is seen as part of lifelong learning, or is general enough, both pull and push factors may be at work in getting IVET graduates to continue studies at higher level.

3.3 Returns to skills

Many studies almost exclusively find that young people with VET have a smooth transition to the labour market (Hampf & Woessmann, 2016; Shavit & Müller 2000; Cedefop, 2012b). Still, recent studies indicate that the positive short-term advantages of VET could fade out over time (e.g. Woesmann, 2018). Hence, it is important to consider both short-and long-term outcomes when the focus is on the returns to VET.

3.3.1 SHORT-TERM OUTCOMES

Compared to general upper-secondary graduates, VET graduates are more likely to be employed, to find a job faster, and to get access to permanent full-time jobs in early career (see e.g. Ryan, 2001; Wolbers, 2007; van de Werfhorst, 2011; Cedefop, 2012b). Bishop and Mane (2005) found that VET students appear to have higher wages than general education graduates. However, the estimated wage premium varies across countries (Cedefop, 2013). Vocational secondary education appears to be more effective when it is occupationally specific by reducing unemployment risks and the probabilities for young people to enter the labour market as unskilled workers (Shavit and Müller, 2000). Busemeyer and Thelen (2015) conclude that youth unemployment tends to be higher in countries where the share of students in apprenticeship-type of programs is low (e.g. Spain) and that, compared with firmbased training, school-based training is less effective in lowering youth unemployment. Hence, VET is considered to help the integration of groups who are at the risk of social and labour market exclusion (e.g. early school leavers) (Cedefop, 2012b).

Apprenticeship systems, compared to school-based VET systems, have shown to provide better opportunities for social inclusion and employment (Baethge & Wolter, 2015). However, the dual system is also associated with higher levels of social inequality (Hanushek & Woessmann, 2006). Early tracking increases social selection in education and diverts young people away from higher education (Dumas, Méhaut, & Olympio, 2013). Shavit and Müller (2000) also indicate that vocational graduates attain less desirable occupations compared to individuals who have graduated from other tracks. Both the "safety net" and the "diversion" effect of VET is found to be most pronounced in countries where vocational secondary education is specific rather than general.

Vocational education may also hinder further educational transitions. Shavit and Müller (2000) mention four different causes. First, studying with students who are academically more successful may have beneficial influence on students' learning (Coleman et al., 1966). However, vocational tracks are usually attended by academically weaker students, which means students in VET do not experience a positive peer effect to the same extent. Second, vocational schools offer a more restricted curriculum (Gamoran, 1987). Third, because the instruction in vocational schools is conducted at a lower level of complexity, vocational education graduates are less likely to succeed in higher education admission tests. Fourth, attending vocational school as a lower track could signal to students that they are less worthy, which could reduce their educational aspirations.

3.3.2 LONG-TERM OUTCOMES

Hanushek et al. (2017) argued that vocational education graduates have better outcomes in the short-term, but general graduates compensate the labour market success in the long run with having a higher employment rate at older ages compared with vocational graduates. Some other recent research confirms the results (e.g. Forster, Bol, & van de Werfhorst, 2016; Hampf & Woessmann, 2017). According to Krueger and Kumar (2002), VET graduates are more likely to have specialised skills, and this may increase difficulties in adapting to new technologies. Woessmann's (2018) research confirms the results that at the beginning of the work career,

vocational graduates might have the specific skills required for the job, but later on, when labour market needs change, vocationally educated individuals are in higher risk of having skills that become obsolete and they are not well-equipped to acquire new skills. General graduates are more likely to participate in career-related training and have better opportunities to update their skills to be employed in a changing economy relative to those with vocational education (Hanushek et al., 2017). Transferable skills such as literacy or numeracy can be acquired through general education, so these skills allow for better and faster adaptation of new technologies (Cedefop, 2013a). Hanushek et al. (2017) show that the late-career disadvantage of vocational degree is more pronounced in countries with a large dual system.

Verhaest et al. (2018) show that vocational graduates are less likely to experience skill mismatches in the start of their careers. Regarding over-education, the advantage seems to persist over the career, while for over-skilling the advantage seem to turn into a disadvantage by the end of the career.

3.4 Tracking and examples from reforms

While there has been research on the effects of tracking, there is less research on the reasons behind the existence of tracking systems and the effects of reforms. Österman (2018) focuses on political explanations to describe the differences in the institutional tracking. Tracking emerged with the expansion of mass education during the late 19th century (Bol & van de Werfhorst, 2013) and is regarded as a response to the industrial development that increased the demand for workers with different vocational skills (Benavot & Resnik, 2006). There is a second, more critical view of tracking, which sees it as an instrument for the social elite to maintain their privileged positions (Benavot, 1983). Österman (2018) argues that both dynamics have played an important role in the development of tracked educational systems. The arguments against tracking emphasise that general skills are becoming crucial in today's labour markets because knowledge-intensive industries have become increasingly important (Nelson & Stephens, 2011). The speed of labour market changes also imply increasing need for the employees to learn new skills and the mastery of transferable skills, which are favoured by more general and broad education (Lundvall & Lorenz, 2012).

Österman (2018) discusses tracking from the viewpoints of Christian democrats, social democrats, conservatives and liberals. He argues that Christian democrats support tripartite institutions that are necessary for specific skill systems and do not consider the educational stratification itself to be a problem. Social democrats would support policies that decrease the stratifying effect of tracking, but at the same time preserve a system that includes vocational education. In line with these, Busemeyer (2015) indicates that Christian democrats strongly support specific vocational education whereas countries dominated by conservatives or liberal parties are oriented towards general skill systems.

Österman (2018) focused on detracking reforms[8] that affected the secondary level, which had the aim to reduce educational stratification and promote equal opportunities by allowing broader access to tertiary education. The results showed that from 1960s to the late 1970s many

[8] The data included 52 detracking reforms in total.

educational reforms took place (broader overview of reforms is summarized in Table 2). During this time period, a number of Western countries[9] implemented comprehensive schooling at lower secondary level and aimed at decreasing educational stratification. In the 1990s, there was a renewed interest in reforms that aimed at fostering the development of general skills and decreasing educational stratification. For example, in the 1990s, the share of general subjects in VET was substantially increased with the curriculum reform in Sweden (Rasmusson, Albæk, Lind, & Myrberg, 2018). These changes followed the demand of a "knowledge society", rapid changes in qualification requirements, and the need for more language skills (Olofsson & Panican, 2017). The reform also made vocational graduates eligible for higher education (Hall, 2012). In the 1990s, reforms in Norway and Finland prolonged the upper-secondary schooling to three years, while in Spain the age of first selection was raised along with the importance of general skills. Also Hungary prolonged the lower vocational track and increased its general content (Österman, 2018).

Olofsson and Panican (2017) discussed the effects of the 1990s educational reform in Sweden and concluded that the growth of general subjects in VET reduced the attractiveness of VET and increased the dropout rate. For these reasons, another reform was initiated to tackle the problem of youth unemployment in Sweden. The main aim of this reform in 2011 was to upgrade the vocational competence by putting greater emphasis on the vocational subjects and introducing apprenticeships as an alternative to school-based learning. Jørgensen (2017) indicates that in the universal welfare regimes, social equality in education is the central value. That is the reason why the new reform faced criticisms, as the reform replaced the principle of equality (equality, citizenship, democracy) with employability and efficiency (Nylund, 2012).

Österman (2018) indicated that Christian democrats, compared to social democrats, conservatives and liberals, tend to preserve existing tracking institutions and early selection age. In addition, the results showed that social democrats are more likely to carry through detracking reforms compared with the Christian democrats, liberals and conservatives. The analysis demonstrates that there is a clear political dimension to the development of tracking. There are also differences across the countries, as some of them have put more emphasis on general skill development and have decreased the overall level of institutional tracking, while others have largely left the traditional tracking institutions untouched.

Hall (2009) indicated that there are convincing arguments both in favour of and against the shift towards a more comprehensive school system. On one hand, opponents argue that upper-secondary education with a substantial academic content may not benefit all students and could even have a negative impact on the educational attainment. On the other hand, supporters of the comprehensive system state that such a system is beneficial because students no longer have to choose a definitive educational pathway that may restrict their future opportunities.

The Danish upper-secondary VET system is based on a modernised form of apprenticeship, which has many similarities with the German apprenticeship system (Baethge & Wolter, 2015). In the early 1970s, the Social Democratic Party in Denmark made a proposal for a unified system of

[9] Nordic countries, several continental European countries, including France, Greece, Italy and Spain. Also similar development was seen in the UK and its former colonies New Zealand and Malta (Österman, 2018).

upper-secondary education that would offer access to higher education for everyone. This proposal faced a strong opposition from both the conservative parties and labour market organisations (Jørgensen, 2017). In spite of the political intentions to build bridges to higher education in Denmark, this had not happened until 2010 (Nord-VET, 2016). EUX programme represents a programme for integrated delivery of vocational and general qualification, which gives access to labour markets for skilled workers and also to higher education. In 2013-2014 only 2% of students participated in the demanding EUX hybrid programme, but the evaluation indicates that it attracted mid-performing students into VET (who have stronger academic performance compared with most VET students, but weaker compared with the strongest gymnasium students (Musset, Field, Mann, & Bergseng, 2019, p. 55).

Compared with Sweden, Denmark has considerably lower youth unemployment rates, which could be partly interpreted as an advantage of the apprentice system in Denmark compared to school-based systems in Sweden (Rasmusson, Albæk, Lind, & Myrberg, 2018). Rasmusson et al. (2018) state that compared to the older Swedish age groups, and to all the Danish age groups, the Swedish younger age group who attended more academically oriented VET programmes have higher proficiency in literacy, which mirrors the effect of the reforms in the Swedish VET system with which the general content in VET was increased. On the other hand, the relatively high youth unemployment rate, and the weaker link between upper-secondary school and labour market are possibly some of the reasons why vocational graduates in Sweden face greater difficulties finding a job compared to Norway and Denmark (Lindahl, 2011). Jørgensen (2017) concludes that offering direct access to employment for all students is hard to combine with offering them also eligibility for higher education, because more academic system would most likely reduce the inclusiveness of the system for students not opting for higher education.

Many countries have adopted number of policies to increase the esteem of VET. Bosch and Charest (2010) differentiate three approaches. First, to expand the academic content of vocational tracks in order to enable students to progress to other forms of education and training. Second, to create separate vocational tracks starting at lower or upper-secondary education and continuing to post-secondary and tertiary level. Third, to maintain the vocational content but offering additional general courses after completion of vocational training in order to acquire a certificate that provides access to tertiary education. As Bosch and Charest (2010) indicate, in the US and Canada, the priority was given to the first approach. However, this approach resulted in strong differences in the prestige assigned to general and vocational tracks at the tertiary level. Upper-secondary vocational qualifications have lost their value for direct entry into the labour market. Countries with strong apprenticeship systems favoured the third approach, which preserved the high vocational content of VET. These different measures have improved the linkage between general and vocational education. As a consequence, the distinction between general and vocational secondary education is significantly less clear today than it was in the past.

Table 2. Reforms in secondary education

Period	Reforms	Examples
1960-s to 1970s	Implementation of comprehensive schooling at the lower secondary level, the additional reforms included other detracking measures that aimed to decrease educational stratification	**Nordic countries**, several **continental European countries**, including **France, Greece, Italy and Spain** implemented comprehensive schooling at lower secondary level and other measures to decrease educational stratification. Also similar development was seen in the **UK** and its former colony **Malta;** **Czech Republic** training for manual and other similar professions became more academically demanding, but on the same time education offered by the gymnasium became less general, because it included unskilled manual work; **Ireland** comprehensive and community schools were established; **The Netherlands** With Secondary Education Act the aim was to increase mobility between the various parts of the secondary education system; **Poland** Unified secondary education, from the 7th to the 9th year of schooling, bringing together general and vocational education[6]; lengthening of upper secondary education; **Portugal** Reform of general secondary education, with the creation of unified secondary education, that brought together general and vocational education; **Germany** *Gesamtschulen*, or comprehensive schools, were introduced in some *Länder* during the 1970s in an effort to provide students with more flexibility. By having all tracks in one school, students could either postpone deciding on a track or more easily switch among tracks[10].
1980s	Differentiation in secondary education	**Czech Republic** Three types of secondary education was implemented, i.e. "gymnázia", "střední odborné školy" and apprentice training. In "gymnázia" general education was reduced in favour of vocational education. For "střední odborné školy", the reform provided for an increase in the share of general and theoretical education; **Finland** Creation of a uniform upper secondary education system and a uniform vocational upper secondary and post-secondary education; **Portugal** Reform aiming at a sequential, interconnected model to provide two alternative paths in upper secondary education: courses mainly geared to the pursuit of further studies (general courses) and courses mainly geared to working life (technological courses); **Spain** Implementation of the experimental reform of intermediate education, which proposes the academic reorganisation of secondary education into two cycles: the first one, from 14 to 16 years of age, an education common to all students; the second, offering two possibilities: an academic one (the "Bachellerato"), and a vocational one (organised into "módulos").

[10] Based on Cooke (2003).

Period	Reforms	Examples
1990s	In the 1990s there was a renewed interest in reforms that were aimed at more general skills and decrease of educational stratification at secondary level	**Sweden** Growth of general subjects in VET; **Norway** and **Finland** Prolonged the upper secondary schooling to three years; **Spain** The age of first selection was raised and importance of learning more general skills was emphasised; **Hungary** Prolonged the lower vocational track and increased its general content; **The Netherlands** The "studiehuis" was introduced in the upper years of senior general secondary education (HAVO) and pre-university education (VWO) to encourage independent study. It was coupled to fixed subject combinations designed to provide an integrated study programme. The aim of the "studiehuis" and the fixed subject combinations was to ensure a smooth transition to higher education.
2000 and later	Reforms to provide access for vocational education graduates to higher education; also in some countries emphasizing more the vocational competences, integrated study programs	**Denmark** Eux-programme is implemented, which represents a programme for integrated delivery of general and vocational qualification, giving also access to higher education; **Finland** Since 2001 the three-year vocational qualifications give general eligibility for both polytechnics and universities; **Sweden** Reform in 2011 with the aim to upgrade the vocational competence putting greater emphasis on the vocational subjects; introducing apprenticeships as an alternative to school-based learning.

Source: Based on Garrouste (2010) and Österman (2018).

3.5 Main changes in VET

There have been indicated some general tendencies in VET (Bosch & Charest, 2015; Guile & Unwin, 2019; Cedefop, 2020).

First, VET is now delivered by an increasingly diverse set of institutions applying a growing variety of learning formats and settings. Previous main models (school-based and apprenticeship-based VET) are being supplemented and complemented by alternative forms of education, training and learning. There are increasingly mixed systems offering different tracks within one system. There also seems to be some convergence in regard to the balance of school-based and work-based learning which has resulted in a growing number of mixed systems.

Second, the number of VET qualifications on offer has steadily increased in most countries, refocusing VET on broader occupational areas. The lines between initial VET and general upper-secondary education are blurring. Hybrid or dual programmes that combine general subjects and vocational specializations have become more common.

Third, there has been a significant increase in VET at higher qualification levels.

Fourth, there has been both an academic and vocational drift. In the last 20 years, the share of VET at upper-secondary level has decreased in countries where it was high in the early and mid-1990s while it has increased significantly in countries with traditionally low shares in VET. A similar pattern can be observed for work-based learning (apprenticeships).

Fifth, there has been a tendency to open up of access for VET graduates to universities through the strengthening of VET qualifications and the creation of so-called higher apprenticeships.

Sixth, there is a trend within school-based VET towards broader vocational domains, a richer mixture of theoretical and general subject matter and qualifications providing access to higher education at the expense of more specific practical VET.

These key changes point to a consolidation, diversification and expansion of European VET. However, fundamental system changes have not taken place, which indicates that pathdependency plays a considerable role. For example, not a single country has changed a school-based VET system to a dual system in the last 20 years.

There has been a continuing debate about the concept and role of key competences in VET. The developments in the work process introduce a new dynamic in the formation of skills and provide a key challenge for the future design and delivery of VET throughout a whole life.

4. Higher education[11]

One feature of higher education compared to secondary education (vocational or general) is the broader emphasis on these skills, which are increasingly demanded in nowadays labour market. Besides generic skills, several European documents mention also VET principles in higher education. For example *Communication on a renewed EU agenda for higher education* marks that "higher education should also allow students to acquire skills and experiences through activities based around real-world problems, include work-based learning and, where possible offer international mobility. Cooperation with employers can allow HEIs (higher education institutions) to increase the relevance of their curricula and deliver them effectively, and to increase opportunities for students to access high quality work-based learning" (EC, 2017, p. 5).

4.1 Diversification in higher education

In higher education, a non-university sector has emerged in various European countries since the 1960s supporting clearly marked inter-institutional diversification (Teichler, 2008). In the 1990s, several countries introduced a separate strand of higher education (as non-university higher education sub-sector) or added new vocationally or professionally oriented higherlevel degree programmes (professional HE). In some countries, this is based on upgrading vocational education and training (VET) institutions, whereas in other this development is linked to growth

[11] This chapter is partially based on the results of Cedefop project „The Changing nature and role of vocational education and training in Europe" where Estonian team also participated (see Cedefop, 2019b).

in private higher education institutions (HEIs), which mostly offer vocationally oriented programmes (Cedefop, 2019). These developments have increased the enrolment in higher education (Sursock, 2015). Müller and Kogan (2010) indicate that two factors have contributed to increasing differentiation of tertiary education. First, increasing emphasis on labour market demands as well as the proliferation and specialization of knowledge. Second, attempts to widen access to higher education programmes. Expansion and need (driven by labour market demand and interest group pressures) to invest ever new study programmes are strong forces of diversification of the system of tertiary education. Differences between countries in established traditions of vocational and general education have led to different forms of differentiation and varying qualifications for which the higher education sector prepares.

Differentiation within higher education systems is based on two concepts: vertical and horizontal differentiation (Teichler, 1988). Horizontal differentiation refers to the distinction between types of higher education institutions on the basis of their functions. Such differentiation reflects the needs and demands of different groups in society (Taylor et al., 2008). Vertical differentiation refers to differences in status and prestige. These differences are more dynamic than horizontal differences. The authors mentioned various factors that would affect the institutional configuration: the government's steering approach, the level of marketization, demographic developments, internationalization etc. (Teichler, 1988; Huisman, 1998). Countries have taken different approaches (see Arum, Gamoran, & Shavit, 2007; Kyvik, 2009; Camilleri et al., 2014; Cedefop, 2019):

a) university-dominated system: The provision of higher education is exclusively reserved for universities. This model is now rare. Italy may be said still to have a university-dominated system, since the introduction of vocationally oriented education and training at higher levels started only recently (Kyvik, 2009, p. 8). This model tends to be quite rigid. According to Arum, Gamoran and Shavit (2007) they are controlled by professional elites who are not inclined to encourage expansion. Other systems consist a mix of institutions that are stratified by prestige and selectivity of both faculty and students. Kyvik (2009) distinguishes this model as stratified and Arum et al. (2007) as diversified. The latter is mainly a characteristic of the American system, which consists of prestigious research universities, a second tier of public and private four-year colleges, as well as many two-year colleges (Grodsky, 2003);
b) binary system: There are two separate strands of tertiary education, where academic strand is provided by universities and professional strand by specialised institutions (such as universities of applied sciences or university colleges). A binary structure can be observed in Austria, Belgium, Croatia, the Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Ireland, Latvia, Lithuania, Malta, the Netherlands, Norway, Portugal, Slovak Republic, and Sweden. The binary structure, however, has variations: in Finland and Austria, there are clear dividing lines between the subsystems, while Sweden belongs to those countries where the dividing lines have become vague either in legislation and/or in practice. Dividing lines of different types can also be observed in Belgium-Flanders, Denmark, Germany, France and the Netherlands (Huisman & Kaiser, 2001), while Norway is moving towards a unified system;
c) unified system: "… the vast majority of higher education programmes – traditional academic studies as well as vocational programmes – are offered within universities"

(Kyvik, 2009, p. 10). This classification applies to Iceland, Spain and the UK. The UK is of particular interest because a development towards a binary system started in 1965 but the distinction between universities and polytechnics was abolished in 1992. The transition to a unified model took place during the time when many other European countries started to introduce binary structures.

Some countries cannot clearly be placed within one of these categories. The French and Slovenian tertiary education systems are sometimes classified as partial unitary systems, where professional higher education is provided within specialised institutions located within universities (Camilleri et al., 2014, p. 24). The French higher education system is also described as fragmented or multi-type (Kyvik, 2009, p. 11). Camilleri et al. (2014) introduced the category "mixed higher education system" which do not make a clear-cut distinction between universities and other institutions.

Numerous countries are displaying a tendency to enlarge the higher education sector in overall terms by reclassifying vocationally oriented programmes or the institutions which offer such provision as part of the higher education system (institutional upgrading). Several countries established universities of applied sciences (UAS) or similar institutions to promote vocationally oriented education and training to the same degree as conventional academic programmes.

Tendencies to merge higher education institutions (HEI) can be observed during the last two decades. In the early 1990s, for example, polytechnics in the UK were upgraded and integrated into the university system (Cedefop, 2011); since then, all HEIs enjoy university status. In the Czech Republic, Poland and Romania, higher education underwent fundamental reform after 1990. These countries introduced a two-part higher education system in which vocational schools were upgraded to HEIs or institutions were unified and accorded a new function as a single institution of higher education. Countries such as Finland, France, Ireland and Norway are also showing a propensity to merge HEIs, with a view to gaining greater strength and visibility in terms of international competition. In Ireland, for example, the aim is to reduce the number of HEIs and give institutes of technology the opportunity to merge and attain the status of a technological university (Hippach-Schneider & Schneider, 2016).

Differentiation usually also occurred via the introduction or strengthening of elements of stratification in higher education. Stratification means the creation of courses of study with different duration, termination levels, cognitive demands and labour market value (Müller & Kogan, 2010). Some researchers interpret the differentiation of higher education as a process of diversion, channelling members of lower social classes to lower-status postsecondary opportunities in order to reserve higher-status opportunities for the elite. Several authors argue that the qualitative differentiation has replaced inequalities in the quantity of education attained (Gamoran & Mare, 1989; Lucas, 2001).

Bathmaker (2017) argues that while expansion may succeed in opening up higher education, the status and value of different forms are not equal in relation to one another. However, when non-university routes are positioned as high-quality routes, they might become increasingly desirable to academic high achievers and high SES students. This might potentially lead to a situation where non-university higher education pathways become colonised by those from advantaged

backgrounds, squeezing out those from less advantaged backgrounds. A longitudinal study in the UK found that there was "little evidence to suggest that the expansion of higher education has favoured those social categories which have low rates of participation in higher education" (Webb et al., 2017, p. 5). According to an alternative view, the expansion of lower-tier higher education enhances opportunity by bringing into higher education students who would otherwise not have continued their education (Dougherty, 1994). Arum et al. (2007) have found that rapid expansion in a diversified and deregulated higher education system can broaden the enrolment in higher education across social classes without any tendency to divert those of disadvantaged origins to lower-tier institutions.

4.2 Vocational and academic drift in higher education

The terms academic and vocational drift have been used to describe changes in higher education. Academic drift is sometimes understood as the increase of student enrolments in higher education (Raffe et al., 2001). Academic drift refers not only to the drift into higher education but can also point to processes of change within it (Kyvik, 2007).

Academic drift is characterised as the tendency of higher education institutions (HEIs) of lesser status to aspire to higher status (Harwood, 2010; Tight, 2015). This process often refers to non-university institutions and is understood as "the attempt of non-university institutions to strive for an academic status, recognition, and rights associated with university in an upward movement to resemble the university" (Griffioen & de Jong, 2013, p. 174). Such changes are also reflected in the profile of the programmes offered by these institutions.

Vocational drift is generally understood as strengthening VET principles in higher education. Such changes can lead to the development of new forms of cooperation with labour market stakeholders, an introduction of new types of providers and programmes, and changes in study contents and profiles of learning outcomes or didactics and assessment (Cedefop, 2019b). The introduction or expansion of professional HE programmes, or even the establishment of a new subsector of higher education, can be regarded as vocational drift (Kyvik, 2009; Camilleri et al., 2014; EC, 2016a).

There have been identified processes which strengthen the vocational aspect (Cedefop, 2017), for example, by:

a) strengthening the focus on professional experience as entrance requirement for learners and/or for obtaining the qualification (such as by introducing or strengthening possibilities for obtaining the qualification based on validation of professional experience);
b) increasing the share of practical or work-based learning;
c) establishing stronger links to labour market stakeholders, encouraging employer engagement and strengthening the role of social partners (such as by involving employers and industry representatives in designing and delivering qualifications, as well as in certification processes).

Researchers emphasise that academic or vocational drift in higher education are not to be considered as substitutes because these developments can be observed at the same time in Europe or even in the same country (e.g. Hippach-Schneider, 2014).

4.3 Recent developments in higher education

There has been expansion and diversification of higher education in European countries over the last two decades. Participation has increased and various forms of programmes and qualifications are offered. This is particularly the case for non-university HE.

Increasing attention is being paid to the world of work outside the HEI. This is also reflected by the fact that universities and other HEIs have begun to offer labour market- and profitoriented continuing VET programmes. Both of these developments are connected with the increasing demand for technological skills.

Many HEIs across Europe, supported by the Bologna Process, have implemented lifelong learning strategies, opened up higher education to different student groups (including adult learners and those with work experience) or sought to offer opportunities for access to higher education without formal qualifications. However, the actual use of this non-traditional access route is still relatively low, also in professional HE. The social dimension in the Bologna process was adopted to encourage countries to develop strategies to widen access to HE and increase participation and completion of underrepresented groups in higher education. This includes the development of alternative access routes for non-traditional students. There seems to be a long way to go to achieve this aim: the latest Bologna process implementation report states that regarding "alternative access routes, little or no progress had been made between 2012 and 2015 in introducing frameworks for the recognition of prior non-formal and informal learning or to open higher education for non-traditional learners" (European Commission, 2018, p. 153).

Countries have opened up higher education for non-traditional students by implementing specific measures:

a) definition of new entry requirements and, in some cases, introduction of specific examinations (for example in Austria);
b) implementation of bridge courses (for example in Norway);
c) procedures to validate and recognise professional experiences. In Norway, admittance on the basis of assessment of real competence is possible for applicants of 25 years or older. In France, one of the main innovations during the past 30 years has been the introduction of new procedures to consider informal learning and experience for delivering formal qualifications. France first introduced legislation to support validation of prior learning in 1984 (Michel & Looney, 2015).

A relatively new phenomenon can be observed in some countries. Graduates of higher-level degree programmes are enrolled in professional HE at lower levels afterwards. In Italy, for example, some students that enrolled in higher technical education programmes (professional HE), already have a bachelor's or master's degree. The main reason is that these programmes offer students more specific preparation adapted to the needs of the labour market. This increases

their chances of finding a job compared to their situation after graduation from the academic university pathway.

In higher education, vocational drift refers to strengthened links with the labour market and employer involvement in governance structures (but less strongly in financing). As the analysis of the trend reports by the European University Association shows, employer engagement in higher education has been growing over the years (Sursock & Smidt, 2010). Currently, in about two thirds of the education systems in the EHEA there is a requirement for the governing bodies of HEIs to involve representatives of other organisations that might include unions and business/industry; in nearly four fifths of the education systems, employers are most commonly consulted regarding the development of new study programmes (EC, 2018, p. 43-44).

The different education policy objectives on which these changes are based include (see also Hippach-Schneider & Schneider, 2016, p. 8):

a) strengthening the relationship between higher education and the economy to ensure that labour market needs are considered: the alignment of programmes and qualifications at higher levels with labour market needs played an important role for change processes;
b) improving social and geographic access to higher education (such as providing possibilities for progression from VET at secondary level to higher education). Supporting individual progression by widening participation at higher education, providing entry pathways for non-traditional students and equality and social inclusion are further reasons for offering professional HE;
c) improving professional preparation for the labour market, ensuring its competitiveness globally and securing a supply of highly skilled labour (also with innovation skills);
d) considering the increasing diversity of qualifications and expectations of students, as well as attracting them.

4.4 Current debates

There is a debate about the level and type of qualifications a society needs. “The master disease” was coined in this debate, raising the question whether the increase in the number of academically qualified, and the academic content of such education, reflects the increased need for this type of competence in the labour market, or whether it is driven by professional ambitions and attempts to enhance prestige in educational institutions, combined with selection and signalling/credential mechanisms. This debate is underpinned by statistical data that shows a future lack of skilled workers and an oversupply of people with general secondary education.

The relationship between different types of higher education provision (academic and professional HE) is a topic of current debate in several countries, with tension observed between further profiling of different types of HEI and increasing or expected harmonisation. UAS are not currently recognised as equal to academic universities; there are still prevailing opinions that universities have higher status than UAS and universities are defending their position strongly. This might also be an obstacle for potential future developments, such as the introduction of

doctoral programmes at UAS or the improvement of the transition from UAS master degrees to university doctoral programmes.

Work-based learning and cooperation with businesses are commonly seen as important aspects; discussions are continuing on how this can be strengthened and improved (not only in terms of quantity but also in quality).

While, for some countries, vocationally oriented higher education and training is still novel and the current debate is focused on consolidation of this type of provision (such as in Italy), other countries are discussing the development of further offers at higher education levels (such as lifelong learning offers) or to introduce new types of HEI.

4.5 Future challenges

In past decades, various convergent and divergent processes in higher education occurred. These processes have had an influence on what is perceived as professional versus academic higher education (Delplace, 2013).

The changing landscape of higher education contributes to the blurred borderlines between systems and subsystems. A clear distinction between academic and professional HE based on the type of HEI is not possible. In many countries, old differences between academically and professionally oriented institutions still exist formally, but – partly due to the Bologna Process – actual differences are diminishing or have ceased to exist altogether. For example, in many cases, both academically and professionally oriented HEIs can offer academic and professional programmes. This also means that while there might be a (formal) distinction between the institutions, there are no differences between the degrees awarded. In other cases, there might be no distinction between institutions, but there could still be a difference between the orientations of the study programmes offered.

Cedefop (2019b) indicates some aspects, which have a pivotal importance to further development in higher education:

1. Juggling between meeting labour market demands and wider societal values.

A greater dominance of firm-specific, instead of industry-specific, skills might lead to narrowgauge programmes, increased dependence of learners and workers on specific employers, reducing the power of labour associations (Graf, 2017, p. 11). Further, the ideal of education aimed at comprehensive personality development and based on a humanistic, enlightenment-emancipatory normative structure might get lost.

2. Finding the right balance between academic and vocational principles.

Blurring borders between different sectors and subsectors of the education system can lead to tensions and discussions on mission, purpose and functions of programmes and qualifications belonging to different sectors. Finding the right balance between academic and vocational

principles, however, requires not only focusing on differentiation from other qualifications, but also considering external factors and more comprehensive needs and goals.

3. Achieving parity of esteem between academically oriented and vocationally oriented qualifications at higher levels by improving awareness and visibility of the latter.

There is evidence that professional higher education is not considered equal in status to other qualifications and programmes offered at tertiary level. This might be due to the poor image of VET in general, the general lack of awareness and understanding of the purposes and functions of these qualifications, the complexity of the area and the diversity of the programmes and qualifications or the lack of permeability between higher VET and higher education.

We could add the additional aspect connected with internationalization of higher education, namely increased inequality on different levels: on macro level inequalities between countries (only some countries are benefitting from internationalization); on meso level (increased differentiation in terms of quality and reputation among institutions in the same country) as well as on micro level (young people who study abroad more often have parents with higher education, higher income and status).

Trumpism, Brexit and the rise of nationalist and anti-immigrant politics in Europe are changing the landscape of global higher education. As Altbach and de Wit (2018) indicate a fundamental shift in higher education internationalisation is connected with these processes. „The unlimited growth of internationalisation of all kinds – including massive global student mobility, the expansion of branch campuses, franchised and joint degrees, the use of English as a language for teaching and research worldwide and many other elements – appears to have come to a rather abrupt end, especially in Europe and North America“ (Altbach & de Wit, 2018).

5. Adult education and training

As Müller and Jacob (2008) indicate, there are different ways to foster the adaptability to new skill demands. First, the education systems face the challenge to implementing the rapid development of skill requirements into the training system without delay (e.g. stronger links between education and training and technology/innovation-intensive sectors). Second, in order to satisfy the increasing demand of flexibility, workers must be empowered in initial education with more general analytical skills, allowing updating of skills in later working life. Third, to enable employees to perform new tasks there should be sufficient opportunities for increasing education and training during the life course. Adult education and training (AET) is a possible strategy of adjusting the skills of the adult population to the needs of the changing occupational structure and ageing societies (Cummins et al., 2015). AET also has important implications for social inequality. On the one hand, this objective is potentially promising to reduce inequalities emerged also in early life. On the other hand, AET may actually increase existing inequalities if well-educated people are the primary group taking advantage of these opportunities (Kilpi-Jakonen et al., 2014).

Mostly, three broad forms of learning activities can be distinguished (Eurostat, 2006, p. 13; see also Myers, Conte, & Rubenson, 2014a[12]):

- formal education and training – provided by the formal education institutions (schools, colleges, universities, and other) that constitute a continuous "ladder" of fulltime education;
- non-formal education and training – any organised and sustained learning activities that do not correspond exactly to the definition of formal education[13]. Non-formal education may take place both within and outside educational institutions. Dependant on national contexts, it may cover educational programmes to convey adult literacy, life-skills, work-skills, and general culture;
- informal learning – intentional learning which is less organised and less structured than the two previous types. It may include learning activities that occur in the family, in the work place, and in the daily life of every person, on a self-directed, family-directed or socially-directed basis[14].

5.1 Skill formation in adult education and training

Organisation of secondary education may have implications on the adult education and training participation rates in general and on inequality in participation among various sociodemographic groups. Therefore, although overall there is an ambiguity about the effects of the secondary education tracking, researchers tend to agree that more differentiating educational systems will also bring about more differentiated outcomes regarding both educational and later labour market outcomes (Hout & DiPrete, 2006). Thus, the level of secondary education stratification could have an effect on variations in AET participation between countries and among social groups within countries.

The degree of the stratification determines to which extent initial and further education either complement or substitute each other (Wolbers, 2005). General skills-oriented comprehensive school systems (for example, the US, the UK, Ireland, Sweden) have low levels of stratification and therefore specific skills are acquired mainly after the initial education, onthe-job training, courses, etc. Here, AET functions as a compensator for the lack of specific skills obtained in initial education (Crouch, Finegold, & Sako, 1999; Brunello, 2001). Highly stratified school systems (e.g. Germany, Austria, Switzerland) are designed to provide specific skills tailored to meet the needs of certain occupations. Thus, specific skills are acquired already in initial (vocational) education and no compensatory mechanism in the form of AET is needed. Hence, participation in AET should be higher in countries with relatively low secondary education stratification. Moreover, studies have indicated that in countries with high AET participation rate, participation inequalities for example

[12] Myers, Conte, & Rubenson (2014a: p. 2) also distinguish fourth form of learning, incidental learning that happens randomly and therefore is not intentional or planned. This type of learning is empirically difficult to capture or influence via policies.
[13] Typically, following learning activities are considered as non-formal (for example in the Eurostat Adult Education Survey): courses; workshops, seminars; guided-on-the-job training; and lessons.
[14] Informal learning might include taught learning (e.g. coaching, informal tuition, guided visits) and non-taught learning (e.g. self-learning, learning groups and non-guided visits).

between high and lowskilled adults tend to be lower (Bassanini et al., 2007; Groenez & Desmedt, 2008; Roosmaa & Saar, 2010; Cedefop, 2015a, 2015b).

However, Bassanini et al. (2007) indicate that it is open to debate whether comprehensive, general education dominated systems are more likely to lead to higher AET participation compared to stratified systems. If it is assumed that vocational education in stratified systems provide highly specialised skills which in the context of technological and other changes are at risk of becoming rapidly obsolete then there should be higher need for updating existing skills.

The impact of stratification in participation in AET could also be viewed as a complement to the initial education (Wolbers, 2005). To maintain interest in learning among those with vocational education, countries with high level of educational system stratification have long tradition of offering learning opportunities for early career (OECD, 2000a). Yet potential participants have to achieve vocational education first, and because of this selectivity inequality in AET participation between high and low-skilled is likely to be high. Still, EstevezAbe, Iversen, and Soskice (2001) maintain that vocational training oriented skill regimes could provide more equal access to learning compared to general skill regimes as in the former workforce is less polarised into high and low-skilled due to a higher proportion of those with vocational/specific skills.

Complementarity between AET and initial education could also be understood in more general terms, because according to previous studies AET participation in countries with both high and low stratification is higher among those with higher level of initial education (Booth, 1991; Oosterbeek, 1998; OECD, 2000b; Brunello, 2001; Arulampalam et al., 2004; Müller & Kogan, 2010). Hence, it could be expected that inequalities in adult learning participation are higher in countries with high proportion of low-skilled people. This stems from the human capital theory, as employer assumes that training costs of low-skilled employee would be higher than for a high-skilled employee. In the context of the demand for skills on the labour market, more educated work in occupations that require high skills and therefore have higher chances to adult learning. Thus, each additional training gives to higher skilled a cumulative comparative advantage (Gangl, Müller, & Raffe, 2003), while those with lower skills receive less return on their education (Gorard & Rees, 2002; Bassanini et al., 2007). Moreover, participation in AET encompasses more risks for the latter group, because of the costs, time constraints, uncertainty about the outcome, etc.

However, if AET would be viewed as a substitute for the deficiencies of initial education, then it is the low-skilled who should receive more training, because they are in more need of upskilling compared to high-skilled adults. Accordingly, AET participation would be more equal in the labour force.

5.2 Returns to adult education and training skills

It is intuitive to assume that learning in all its various forms (formal, non-formal, informal) should have positive economic as well as non-economic returns for individuals but also for companies, economy, and society as a whole. However, there are considerable difficulties with measuring actual and possible outcomes of AET (see for example Desjardins & Schuller, 2007 OECD report Understanding the Social Outcomes of Learning). One of the difficulties stems from the complexity of the phenomenon at hand and thus there is no universal understanding of adult learning

(Desjardins, 2017). There are significant country differences in what is regarded as adult learning and how adult learning relates to education systems and other institutions at play (e.g. labour market, welfare state). To overcome this complexity, human capital theory has provided a powerful tool for the analysis of links between learning and outcomes and therefore results generated in this framework have given priority to the economic value of the investment in AET by focusing on such returns as employment, wages and economic growth (ibid.). In addition, research building on human capital theory often focuses on formal qualifications because these are more clearly measureable and available. Thus, also in the following overview, most of the studies introduced have dealt with economic returns to AET in the context of adult formal learning.

In recent years, several reviews on adult learning and respective benefits have been composed. For example, Field (2012) examined the evidence of the economic impact of lifelong learning, but also the impact on one's social and personal well-being (confidence, selfesteem, building networks, mental and physical health)[15] and on the wider community. The focus of the review is on research based on longitudinal data and much of this research is done in the UK. Myers et al. (2014b) reviewed studies concerned with the relations between formal (obtaining basic skills and higher education) and non-formal (workplace learning) AET and financial and non-financial (health, well-being, civic engagement, etc.) outcomes at individual, company and society level. A review by Midtsundstad (2019) is engaged with research on adult learning and employability with specific focus on studies that investigate the impact of adult learning on older workers' labour market participation[16]. Largely, the latter overview builds on the research presented in the edited volume by Blossfeld et al. (2014). Based on these reviews and some other thematic studies an overview is given by economic returns of adult education and training, AET returns to working life quality and innovation and the returns on skill supply.

5.2.1 ECONOMIC RETURNS OF AET

Regarding the returns of AET, there is a vast amount of literature providing empirical evidence, based either on cross-sectional or longitudinal data, on how learning activities increase labour market outcomes, most often in terms of employment probability and wages (e.g. OECD, 2004; Vanttaja & Järvinen, 2006; Coelli, Domenico, & Zakirova, 2012; Desjardins, 2017). However, the positive effect of AET is not straightforward and conclusive. Thus, in the case of formal education it seems that the positive effect on *employment* probability varies depending on the level of education obtained and/or labour market status (Jenkins et al., 2002; Kilpi-Jakonen, et al., 2012). Several studies suggest that participation in AET also reduces *unemployment risks* (OECD, 2004; Barbieri et al., 2014; Csanádi, Csizmady, & Róbert, 2014; Wahler et al., 2014[17]), yet for example in Spain such results were not confirmed as both formal and non-formal AET decreased chances of

[15] Field (2012) also points to the studies indicating negative impact of AET on people's well-being (e.g. stress, broken relationships, dissatisfaction with present way of life, recollection of previous negative learning experiences), however, these are not the topics central to this review.
[16] Midtsundstad (2019, p. 5-12) provides a detailed table of the studies reviewed, indicating following aspects: author, year, country (out of 27 studies, only three represented CEE counties and two were based on country comparisons), dataset, variables, design, methods of analysis, findings.
[17] Respectively in a single country studies, in case of Italy, Hungary and Denmark, adults who participated in AET tend to have lower unemployment related risks.

re-employment (de Vilhena & Gamund, 2014). Also for Denmark, it has been found that non-formal AET raises unemployment risks and lowers the chances of employment (Wahler et al., 2014). Overall, formal adult learning on average seems to increase employment returns, yet the effect of non-formal AET is more mixed (Buchholz, Unfried, & Blossfeld, 2014; Elman & Weiss, 2014; de Vilhena & Gamundi, 2014; Wahler et al., 2014).

Studies conducted around the first half of 2000s indicate strong evidence of wage effects of non-formal AET for example in the US and the UK (Blundell et al., 1999; Leuven, 2004), yet in case of Germany[18] and the Netherlands no such positive effect is found (Pischke, 2001; Leuven & Oosterbeek, 2008; Rüber & Bol, 2017). Regarding formal AET, several studies suggest that this has no considerable effect on wages (Jenkins et al., 2002; Silles, 2007; see also overview by Myers et al., 2014b). Thus, studies indicate a narrative of disadvantage regarding adults who obtain formal qualifications in later stages as compared to normative completion age (Desjardins, 2017). However, these disadvantages arise precisely when adult learners are compared with those who obtain certain levels of education at a normative age, so when outcomes are compared with those who did not complete a comparable educational level, the advantages of formal AET are more evident (ibid.). Still, a study based on the PIAAC 2012 data shows that wage premium difference between adults attaining a higher education within or beyond the normative age is marginal and actually, in about half of the countries analysed, the difference is in favour of adult learners (ibid.). In addition, several more recent studies lend evidence to the positive wage effect of formal AET (Jepsen, Troske, & Coomes, 2014; Hällsten, 2012; Nordlund, Stehlik, & Strandh, 2013; Kilpi-Jakonen & Stenberg, 2014; Kilpi- Jakonen, Sirnio, & Martikainen, 2014). Some suggest higher wage premium for women compared to men (Elman & Weiss, 2014; Stenberg, de Luna, & Westerlund, 2014).

Overviews by Field (2012) and Myers et al. (2014b) suggest that workplace or work-based learning, i.e. non-formal AET is associated with higher wages, yet these findings are not consistent across the literature and estimates vary greatly. A study based on the International Adults Literacy Survey (1994-98) covering 22 countries indicated that on average economic returns to non-formal AET were in short term greater compared to those of formal AET (Triventi & Barone, 2014). Therefore, important factor might also be the follow-up period, as was confirmed in case of Sweden based on the longitudinal register data that the positive wage effect of completing higher education fully emerged after about 10 years later, and again only in case of women, especially women with children[19] (Stenberg & Westerlund, 2016). Moreover, this study indicated that the benefits of AET for society exceed the costs.

On the level of organisation, some earlier studies show strong positive influence of AET on enterprise productivity as measured by a real value added per work, moreover, there is evidence that the effect of training on productivity is actually larger than the effect on wages (in case of the UK Dearden, Reed, & Van Reenen, 2006).

[18] In countries characterised by dual apprenticeship system, higher wage returns should be expected to formal education compared to non-formal or informal training, which takes place later in the lifecourse. In addition, strong collective bargaining leads to compressed wage structure that is also likely to translate into lower individual training wage returns (Acemoglu & Pischke, 1999).
[19] Authors assume that the observed gender gap in the wage premium of higher education obtained in adulthood might stem from differences in underlying reasons for taking up the learning (Stenberg & Westerlund, 2016).

Some studies analysed the effect of formal AET on occupational or social *mobility*, which is related to economic benefits, but partly also to prestige or status of an occupational position. Results vary considerably. For example, there were studies indicating positive effect of formal AET on upward mobility, yet without protection against downward mobility (Hamplová & Simonová, 2014; McMullin, & Kilpi-Jakonen, 2014), while other studies show that there is also a reduction in downward moves (Buchler et al., 2014; Wahler et al., 2014) or that upward mobility is confirmed only for women (Csanádi et al., 2014; Saar, Unt, & Roosmaa, 2014).

5.2.2 RETURNS TO QUALITY OF WORKING LIFE AND INNOVATION

In addition to economic returns, AET could lead to jobs with better quality of working life, for instance in terms of job satisfaction and commitment to work. These aspects of work can in turn be related to willingness to undertake and cope with changes and innovation on the labour market and in the economy (Desjardins, 2017). As indicated by Desjardins (2017), studies conducted in the UK and Germany indeed show a link between participation in adult education and job satisfaction (Jones et al., 2008; UKDBIS, 2013; Georgellies & Lange, 2007; Schmidt, 2007). Another study dealing with career success among the age group 50 and older in the Netherlands found that employees' social skills and motivation for continuous development was associated with higher career success and satisfaction, which might lead to longer employment (Hannekam, 2015). However, this study also indicated that sometimes the need for constant development, being up-to-date with newest (technological) changes, was perceived as a negative pressure decreasing career satisfaction and therefore tends to push towards retirement.

Furthermore, there are studies indicating a strong connection between job satisfaction and commitment to the company/employer (e.g. Bartlett, 2001). As commitment to work is seen important for creativity of employees then it is in turn linked to product and organisational innovation (Brown, Lauder, & Green, 2001). Accordingly, findings by Cedefop (2012c) suggest that in addition to formal learning, learning-intensive forms of work (especially task complexity) and organisation and workplace learning (i.e. non-formal AET) correlate with the country level innovation indicators. In fact, results show that non-formal AET had stronger correlation with innovation than higher education.

However, based on the PIAAC 2012 data Desjardins (2017) proposes that also the degree of the openness of higher education system to adult learners is of significance. Thus, there is a strong correlation between higher level adult education and the percentage of employees reporting the introduction of a new process or technology (innovation) and substantial restructuring or reorganisation at the workplace (adaptability).

5.2.3 AET EFFECT ON SKILL SUPPLY

Literature on the effectiveness of formal and non-formal AET on acquired skills is rather scarce. In a respective literature review, Vorhaus et al. (2011) discuss ten years of research related to adult literacy and numeracy improvement based on research done in the UK and other English-

speaking countries. Among other things, they conclude modest gains in literacy and numeracy in England. Examining the degree to which British adults' reading comprehension skills improved via participation in workplace literacy courses, Wolf and Jenkins (2014) find small but significant effects only for those for whom English is second language. However, authors assume that this improvement in skills is more likely to do with more time spent in an English-speaking country. This study also points to the complexity of reading skills, and that for considerable progress longer periods of learning and instruction are needed.

Analysis of PIAAC 2012 data shows strong correlation between the percentage of higher education levels attained via AET and the literacy, numeracy and problem-solving skills (Desjardins, 2017). Therefore, these results suggest that education could improve cognitive skills. Moreover, with age cognitive skills tend to decrease among adults (Desjardins & Warnke, 2013), thus open and flexible formal AET system can be significant in alleviating skill loss in older age (Desjardins, 2017). However, without longitudinal data it remains open if there is a causal effect of AET participation on improvement of skills. There are some studies which have analysed longitudinal data (for example German PIAAC-Longitudinal) and found that positive association between job-related training and skills is explained by the selection effect, meaning that those with higher skills are more likely to participate in training, as opposed to job-related training increasing one's skills (training effect) (Gauly & Lechner, 2019). This result could be explained via individual characteristics (such as learning motivation, ability, etc.) or skill demand, as employees in jobs that require higher-skills are more likely to receive training (OECD, 2013).

In sum, variations in the described effects of AET are partly to do with differences in data and methodology applied, but partly these also arise from the institutional differences between education systems, labour markets and the welfare systems of the countries (Kilpi-Jakonen et al., 2012; Triventi & Barone, 2014; de Vilhena et al., 2014; Desjardins, 2017). Field (2012) urges to interpret findings regarding the effect or outcomes of AET with caution, as there are considerable data weaknesses, the relationships seem to be non-linear and adult life-courses are complex and depend on the context. Moreover, as shown by Gauly & Lechner (2019) much of the cross-sectional research findings probably overestimate the AET effect on skills because training is highly selective.

5.3 The role of NQF and validation of non-formal learning

The increasing diversity of participants, courses and providers has led to demands for new measures to restore transparency. The National Qualification Frameworks (NQFs) are the key instrument for reducing barriers to progression in education and training and for moving towards lifelong learning. The NQFs will help individual learners to move horizontally and vertically, to combine education and training from different institutions and to develop their lifelong learning careers. There is a growing trend among countries to open up their frameworks to include qualifications awarded in AET. However, quite substantial country differences do remain. While NQFs have the potential to play a crucial role in carrying out policies that might lead to comprehending VET as a lifelong learning system, the diversity across the NQFs has an impact on how efficiently and with which results these processes take place. Ireland, France, the Netherlands, Slovenia, Sweden and the UK have developed criteria and procedures for inclusion qualifications awarded outside formal education and training. For example, in Sweden, the NQF

came into force in 2016 with the development aim of establishing a comprehensive framework that could include qualifications from the formal education system as well as from other providers. In some other countries (Germany, Austria, Italy) the NQFs are developed through a step-by-step approach initially only including vocational and higher education qualifications but progressing towards a comprehensive framework. This means that in these countries the NQFs promote a better linking of various programmes and certificates. As a result, the distinction between CVET and IVET as well as formal and non-formal education actually becomes less relevant.

Validation of non-formal learning has a link to NQFs, in that NQFs act as a reference point for identifying, documenting, assessing and recognising learning acquired in non-formal and informal settings (see Cedefop, 2017a; Cedefop, 2018a). In some countries, like Norway, Finland, Portugal, France etc., these arrangements may play a direct role in relation to CVET. These arrangements make it possible for people to access further education as adults, have their training periods shortened and may thus directly influence their learning progression.

5.4 European Union policy debates on adult education and training/lifelong learning

The starting point of this overview is 1990s, because before that, in the 1970s and 1980s, adult education and training seldom appeared on the EU policy agenda (Volles, 2016). Since the 1990s, the EU began to play a major role in promoting lifelong learning and there is considerable literature on the EU's respective policies (e.g. Pépin, 2006; Dale & Robertson, 2009; Holford & Mohorčič Špolar, 2012; Holford & Mleczko, 2013; Volles, 2016). In broad terms, focus of these studies has been on two main themes: lifelong learning as a promoter of economic competitiveness and social integration, citizenship and personal fulfilment, etc. (Holford & Mleczko, 2013).

Dualistic debate between humanistic and neoliberal objectives of lifelong learning or adult education and training in the international arena can be traced back to 1970s. On the one hand, humanistic approach of the UNESCO, which manifested in the publication of the Learning to Be or so called Faure Report that emphasised learning throughout one's entire life and complete fulfilment of a man (Faure, 1972). While on the other hand, the OECD ideas on adult learning largely revolved around human capital notion (Schultz, 1961), for example as stated in the 1973 report Recurrent Education: A Strategy for Lifelong Learning.

Largely drawing on the work of Volles (2016), below, developments in the EU policy agenda regarding lifelong learning are organised in three periods: 1992-1999 – re-emergence of the lifelong learning topic; 2000–2007 – lifelong learning in the centre of the EU policy; 2008–2018 – lifelong learning for meeting the labour market need. For a summary, please see Table 4a in the Appendix.

5.4.1 THE 1992–1999, LIFELONG LEARNING RE-EMERGES TO THE EU POLICY AGENDA

In the 1990s, adult education and training or in terms of the EU policy documents, lifelong learning (LLL) re-emerges to the EU agenda. Field (2006) argues, that compared to the UNESCO and the OECD, which played an important role in the 1970s and 1980s, in the 1990s the EU had a decisive position.

Volles (2016) points to the shift in LLL discussion from social integration towards neoliberalism by comparing discourse of Delors's white paper Growth, Competitiveness, Employment – The Challenges and Ways Forward into the 21st Century (1993) with the Council's conclusion in the Strategy for Lifelong Learning (CE, 1996). The latter clearly emphasises individual responsibility for acquiring new knowledge and skills. Nonetheless, the EU also stresses various non-economic objectives of the LLL. For example, the white paper on Teaching and Learning: Towards a Learning Society (CEC, 1995), outlines five general objectives among which combating exclusion and developing proficiency in three European languages could be regarded as non-economic. Therefore, since the mid 1990s, it can be observed that economic aims of LLL where complemented by the social and cultural objectives (Dehmel, 2006).

5.4.2 FROM 2000–2007, LIFELONG LEARNING IN THE CENTRE OF THE EU POLICY

This period is marked by the Lisbon Strategy which declared that by 2010 the EU should become "the most competitive and dynamic knowledge-based economy in the world" (CE, 2000, p. 5). Education and training throughout one's life was deemed of utmost importance in achieving this aim and therefore LLL is at the centre of the EU policy.

The EU introduced the open method of coordination (OMC) – new way of governance which was based on identifying and disseminating best practices and guidelines. OMC enabled input from member states, candidate countries, civil society organisations and social partners. The Memorandum on Lifelong Learning (CEC, 2000) was the first LLL policy to employ OMC.

Although economic aims were important, key documents issued in this period did emphasise equity-related topics as well. For example, the Efficiency and Equity in European Education and Training Systems discussed vocational education and training opportunities of less wellqualified and unemployed (CEC, 2006). Key Competences for Lifelong Learning: European Reference Framework (DG-EAC, 2007) set eight equally important competences, among them those with elements other than solely connected with neoliberalism, i.e. competitiveness and globalisation (Holford & Mohorčič Špolar, 2012) (e.g. social and civic competences and cultural awareness and expression, multilingualism). However, in the literature on the EU LLL polices, there is rather clear consensus that the EU's approach to LLL is strongly vocational because competition and the free market were pivotal in its founding treaties (ibid.).

According to Volles (2016), during this period there seems to be a difference in the interpretation of some main LLL themes at the EU versus national level. For the EU keywords were "labour market", "employability", "flexibility" and "mobility", yet at the national level there tended to be a

concern about the balance between market interest and personal and social needs. Thus, the dualistic nature of the LLL concept persisted (Volles, 2016).

5.4.3 FROM 2008–2018, MEETING THE LABOUR MARKET NEEDS

The beginning of this period is marked by the global financial and economic crisis. Among other things, the EU made efforts to strengthen the European Education Policy Space and to raise the effectiveness of education and training policies (Volles, 2016). The OMC was reaffirmed in 2009 and 2012 and it seemed that this reinforced the neoliberal agenda (Volles, 2016; see also Holford & Mohorčič Špolar, 2012). The role of private companies and industry in developing LLL discourse was increasing and they stressed the skills crisis, meaning that skills supply did not meet the labour market needs (Kleibrink, 2011).

Surge of unemployment, among youth in particular, and in the context of an ageing population, the EU called for validation of non-formal and informal learning[20], as this was seen to have an important role in enhancing employability and mobility, but also increasing motivation for LLL, especially among the socio-economically disadvantaged (e.g. unemployed) or the low-qualified (CEU, 2012). Recognition of knowledge, skills and competences acquired outside formal learning settings can be traced back for example to the Bruges Communiqué (CE/EC, 2010) or Establishment of the European Qualifications Framework for Lifelong Learning (EPCEU, 2008).

Indicators in the Education and training Monitor 2013 showed that several EU countries were not meeting the education and training aims, particularly in the sphere of basic skills, early school leavers, entrepreneurship and adult education (EC, 2013). Thus, for example the Rethinking Education Strategy indicates a turn towards learning outcomes (EC, 2012c) and further, the focus is on development of entrepreneurial skills and a sense of initiative (EC, 2013, p. 1). Volles (2016) maintains that the tone of the EU became sharper and more utilitarian.

To tackle problems mentioned above, A New Skills Agenda for Europe. Working together to strengthen human capital, employability and competitiveness emphasises strengthening of basic skills (literacy, numeracy, digital skills), but also acquiring key competences and higher, more complex skills (with special attention to entrepreneurial and innovation-oriented mindset) and making VET a first choice (CEC, 2016).

Comparing the 2018 Council's recommendations on key competence for LLL (CEU, 2018) with the list of 2007 competences (DG-EAC, 2007), several remain the same, but in 2018 literacy, engineering and personal competences are added (see Table 4a, Appendix).

However, although the emphasis is clearly on skills and vocational learning (e.g. improving attractiveness of VET), social inclusion topic is constantly present within the policy documents (Holford & Mohorčič Špolar, 2012). For example in the Europe 2020: A strategy for smart, sustainable and inclusive growth (CEC, 2010) or in Key competences for lifelong learning (CEU,

[20] For more detail, see chapter "The role of NQF and validation of non-formal learning", p. 38-39.

2018) where in addition to employability aim of skills and competences, aims related to personal fulfilment and health, active and responsible citizenship and social inclusion are mentioned.

6. Concluding remarks

The most prominent aspect in the current debates on the changes in the world of work is the massive technological progress and the overall upgrading of the occupational structure. The composition of employment is shifting towards jobs that require high-level cognitive and social interaction skills or are characterised by non-standardised tasks (ILO/OECD, 2018). The jobs destroyed and those created will require very different sets of skills putting pressure on educational and training systems to provide good skills as well as reskilling and upskilling opportunities. Fast changing labour markets will impose a challenge on educational and training systems and will require new approaches to lifelong learning. It is assumed that large parts of the workforce have to be trained more intensively and more continuously over their lifetime.

Müller and Jacob (2008) indicate that there is no single strategy to respond to changes in skill demands. First, the education faces the challenge of implementing the rapid development of skill requirements in the system. Second, in order to satisfy the increasing demand of flexibility, workers must receive in initial education more general analytic skills, allowing readjustments and a flexible updating of skills in later working life. Third, to increase flexibility and to enable employees to perform new and challenging tasks involves increasing education and training during the life course. The frontloading skills through initial training for a single lifetime qualification is no longer effective and is increasingly being challenged in the context of changing skill needs.

The process of qualification attainment share many similarities in European countries, but they are also shaped by particular institutional and structural conditions. With regard to secondary education, different systems need different adaptions. Still requirements could be strengthened by enhancing training of generic competences and providing better opportunities to enter tertiary education in countries with more vocationally oriented systems. In countries where secondary education includes little vocational specialization, the education and training system may profit from the introduction or strengthening of a curricular option in which vocational qualifications can be acquired.

Strengthening tertiary education is a mean to build a workforce well prepared for the future. There has been expansion and diversification of higher education in European countries over the last two decades. The alignment of programmes and qualifications at higher levels with labour market needs have played an important role. Besides, countries with strong vocational traditions need considerable efforts to catch up with leading countries in extending and developing the tertiary education sector.

In response to the demand for higher level skills, there has been a diversification of the providers of post-compulsory education and training. A wider range of public and private education and training providers now offer more diverse and flexible courses catering to a more diverse population of learners. This has created more diverse pathways to and from tertiary education

and training and it is expected that this trend will continue and intensify in the future (UNESCO, 2015). In this context, innovative public-private partnerships between schools, universities and private training providers should be further encouraged to invest in skills development of a more fluid and highly mobile workforce (EC, 2016b).

Müller and Jacob (2008) indicate that there is significant underinvestment in adult education and training. Substantial investments in education and training in later stages of life could increase participation in lifelong learning. Another strategy is to reshape the institutional conditions for lifelong learning. ILO/OECD (2018) indicates that for the potential of skills development to be realised, the role of non-formal learning should be recognised. The European Union recommendation on validation of non-formal and informal learning (CEU, 2012) conveyssimilar idea. This will increase the incentives for individuals to invest in training, and also make it easier for them to retrain in areas of high demand. Therefore, ongoing efforts are required to certify learning outcomes and validate or recognise informal and non-formal learning.

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APPENDIX

Table 1a. Typology of education and training systems (ETS)

	Japanese model	German model	French model	Swedish model	UK model
Countries	Japan, South Korea, Taiwan, Singapore	Germany, Austria, Switzerland, the Netherlands, Czech Rep., Slovak Rep., Hungary, Slovenia	France, the "Latin rim" states, Bulgaria, Romania	Sweden, other Nordic countries	England, Wales, Baltic countries
The role of the state	Government of the market providing investment and strategic leadership	State intervention to regulate labour markets and co-ordinate the roles of the social partners	State centred concepts of political membership	Social democratic state, active labour market measures for unemployed and redeployed adults	
Management-labour relations	Paternalistic form of organisations; lifetime employment, seniority wages, compliant single company unions	Large sectoral unions; co-operation and compromise; relatively high levels of "trust"; strong traditions of social partnership	Widespread sectoral agreements between unions and employers		
Labour market structure	Internal labour market	Occupational labour market	Internal labour market	Internal labour market	Mixture of occupational and internal labour markets
Characteristic features of skills formation	Cultivation of specific technical skills less important; in-company training	Standards-based occupational qualifications act as the crucial exchange mechanism	Externally assessed, state-validated certificates play quite an important role	Strong traditions of liberal adult education	

	Japanese model	German model	French model	Swedish model	UK model
Education and training system: general organisation and principles	Generally highly centralised; strong emphasis on the development of group cohesion and conformism	ETS is organised on a regional basis	Strong central control; emphasis on civic education	Substantial devolution of control during the last decade to the local or municipal levels; strong emphasis on equality and social solidarity	Limited state control in education: in recent years introducing competitive, quasi-market relations into education and training
Compulsory education	Comprehensive schools	Different tracks leading to different occupational destinations	Comprehensive schools	Comprehensive schools	Comprehensive schools
Secondary schools	General secondary schools predominate over vocational secondary schools	Vocational secondary schools predominate; dual system of apprentice training	School-based systems of upper secondary education with only a residual apprentice system	Predominantly school-based with the dominant institution being the comprehensive secondary school; the apprenticeship is either essentially school-led (Sweden) or dual (Denmark, Norway)	A "mixed system" comprising both school-based and work-based elements: more differentiated than the more integrated upper secondary systems
Adult education and training		Less developed, participation comparatively low	Less developed, participation comparatively low	Prevalent, often subsidised by the state	Relatively widespread, unevenly distributed
Relationships between firms and ETS	Standards-based qualifications are not important; recruitment is based on recommendations, company assessment tests and the reputation of the institution	Strong company commitment to training	Qualifications play an important role in job recruitment and promotion and pay levels; many firms are unable to deliver extensive in-company training.		

	Japanese model	German model	French model	Swedish model	UK model
Skill formation: level of skills		Intermediate level of skills	Intermediate level of skills	High aggregate level of skills	Moderate aggregate level of skills
Skill formation: skill polarisation		Quite evenly distributed	Signs of skill polarisation	More evenly distributed	High level of skill polarisation

Source: Saar & Ure (2013, p. 55–57) based on Green (1999, 2006).

Table 2a. Typology of skill formation systems

	Market model	Corporatist model	Developmental state model	Neo-market model
Countries	The UK, USA, Canada etc.	Germany, Austria, Switzerland, Denmark etc.	Japan, Singapore, South Korea	Chile, Mexico, Brazil
Key societal characteristics	Large social inequalities	Low degree of inequality	Economic security provided by the family, relatively egalitarian distribution of income	Large social inequalities
Production system	Low value-added industries with a few higher value-added industries	High value-added industries	Mostly low value-added industries; more recently the shift in direction of higher value-added forms of production	Low value-added industries with a few higher value-added industries associated with foreign capital
Management-labour relations	The dominance of capital; only the professions sustained a strong control over training and entry to the occupation	Strong labour movement; strong control over training; trust between capital and labour	Unions remain defensive and focused almost exclusively on wage bargaining	Relatively strong labour organisations; increasing power of capital relative to labour
Form of interaction between the state and market	A relatively high degree of autonomy in relations to the state	The state is more heavily involved with both employers and unions	An important role of the state in relation to labour	The privatisation of major industries reduced the power of the state
Main principles of skill formation	Training is seen as the responsibility of either the employer or the individual	Governments, with support from labour, have encouraged the growth of high levels of initial training	Leading role of the state	The state has relinquished control over the delivery of training to the market
Skill formation system	In-company training	Use of ETS to provide the appropriate skills	ES and training controlled by the state	Foreign capital, private providers
Vocational training system	Support the immediate needs of employers	Stronger impact on the employers' demand for skills, creating pressure on employers to sustain higher value-added forms of production	Different	Support the immediate needs of employers

Coordination of supply and demand	Through the market, slow	Agreements between the state, capital and labour; a "tighter fit" between demand and supply	State	Market
The role of the state	Training of the unemployed, maintaining the employability of marginal workers operating in low-cost forms of production	Beyond the provision of training for the unemployed	Upgrading the skills of the employed	Training of the unemployed, maintaining the employability of marginal workers operating in low-cost forms of production

Source: Saar & Ure (2013, p. 61–62) based on Ashton, Sung, & Turbin (2000).

Table 3a. Varieties of capitalism approach and its extension

	Liberal market economy	**Coordinated market economy**	**Dependent market economy**
Economic governance	Limited business coordination, antitrust laws	Strong business associations, inter-company networks	Hierarchy within transnational corporations
Corporate governance	External control/dispersed shareholders	Internal control/concentrated shareholders	Control by headquarters of transnational enterprises
Industrial relations	Market based Few collective agreements Decentralised bargaining Trade unions and employer associations are weak; low-cost hiring and firing	Corporatist Sector-wide and even national agreements Coordinated bargaining Statutory worker representation Strong trade unions and employer associations; employee cooperation in firms and wage moderation	Company level collective agreements Decentralised bargaining Trade unions and employer associations are weak
Education and training system	General competences Initially employers invest little in human capital	Industry and/or company-specific competences Initially employers invest in human capital	Limited expenditures for further qualification
Transfer of innovations	Based on markets and formal contracts	Important role of joint ventures and business associations	Intra-firm transfer within transnational enterprise

Welfare state	**Liberal**	**Social democratic**	**Conservative, familistic**	**Neoliberal**	**Embedded neoliberal**

Labour market policies	Minimal income protection	Generous income protection Strongly developed active labour market policy	Good income protection Medium developed active labour market policy	Minimal income protection Less developed active labour market policy	Medium income protection Medium developed active labour market policy
Countries	United States, the United Kingdom, Ireland, Canada, Australia, New Zealand	Sweden, Norway, Finland, Denmark	Germany, Austria, Belgium, the Netherlands, Switzerland, Italy, Greece, Spain, Portugal, Slovenia	Baltic countries	Hungary, the Czech Rep., Poland, the Slovak Rep.

Source: Saar & Ure (2013, p. 68–69) summary based on Hall and Soskice 2001; Estevez-Abe, Iversen and Soskice 2001; Esping-Andersen 1990, 1999; Ebbinghaus and Manow 2001; Bohle and Greskovits 2007a; Nölke and Vliegenthart 2009.

Table 4a. Overview of EU lifelong learning policy milestones

Period	Historical context	The EU strategies	Key documents on LLL/AET	The objectives of LLL/AET
1992-1999, preceding the Lisbon Strategy	Economic crisis, high unemployment, sluggish growth, lack of competitiveness	1992 Maastricht Treaty, establishes the EU, giving Parliament more power	*Growth, Competitiveness, Employment* (Delors, 1993). White paper on how education and training systems in Europe need to adapt	LLL as a central issue on the EU policy agenda "…finding a new synthesis of the aims pursued by society (work as a factor of social integration, equality of opportunity) and the requirements of the economy (competitiveness and job creation)" (Delors 1993, p. 3) LLL was seen as the "catalyst of a changing society" (Delors, 1993, p. 6)
	Labour market inflexibility	1997 Treaty of Amsterdam, enlargement to 25 EU Member States	*Teaching and learning: Towards the learning society* (CEC, 1995). White paper in preparation of the European Year of Lifelong Learning (1996)	Encouraging the acquisition of new knowledge Bringing the education and business sectors closer together *Combating exclusion* *Developing proficiency in three European languages* Treating capital investment and investment in training on an equal basis
	Knowledge economy, shift too slow		European Year of Lifelong Learning (EYLLL). Initiative (1996) to foster the public debate on the future of European education and training systems	Since the mid 1990s economic aims of LLL complemented by the social and cultural objectives (Dehmel, 2006)

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	Enlargement of the EU: 15 Member States (1995)		*Strategy for Lifelong Learning* (CE, 1996). Council conclusion closing the EYLLL	Shift away from social integration, stressing individual responsibility for learning (Volles, 2016)
2000–2007, transforming LLL into reality	Unemployment – the rate of unemployed women and older workers remains high	2003 Nice Treaty, reforms the institutional structure of the EU to withstand eastward expansion	*A Memorandum on Lifelong Learning* (CEC, 2000). Working paper in response to the Lisbon European Council	LLL moves from a post-compulsory vocational education/training to a more holistic lifelong and -wide approach
	Globalisation, increased economic crisis linked to globalisation		*The concrete future objectives of education and training systems*. Report from the Education Council to the European Council (CEC, 2001)	improving education and training for teachers and trainers, developing skills for the knowledge society, increasing the recruitment to scientific and technical studies, making the best use of resources, open learning environment, making learning attractive, improving foreign language learning, and increasing mobility and exchange
	Knowledge economy, shift is too slow		*Making a European Area of Lifelong Learning a Reality* (CEC, 2001a)	Key words for the EU: labour market, employability, flexibility, mobility. Concern at the national level: balancing market interests with personal and social needs
	EU enlargement, 27 Member States by 2007		*Education and Training 2010* (CE, 2001b), report on shared objectives for education and training systems to be achieved by 2010. LLL is introduced into the employment strategy	

Period	Historical context	The EU strategies	Key documents on LLL/AET	The objectives of LLL/AET
			Council resolution on *Lifelong Learning* (CE, 2002). Promoting LLL in order to establish concrete strategies and activities	
			Investing efficiently in education and training: an imperative for Europe (CEC, 2003). Inviting member states to put in place partnerships and incentives for greater and sustained investment from enterprises and individuals	
			Efficiency and equity in European education and training systems (CEC, 2006). Communication from the Commission to member states: national LLL strategies to be adopted by the end of 2006.	Emphasis to discourse of equity continues (Holford & Mohorčič Špolar, 2012)
			Towards more knowledge-based policy and practice in education and training (CEC, 2007). Commission of staff working paper demanding more evidence-based policies and practices to modernise the education and training systems	
			Key Competences for Lifelong Learning: European Reference Framework (DG-EAC, 2007). Key competences are those which all individuals need for personal fulfilment and	Eight key competences, all considered equally important: communication in the mother tongue; communication in foreign languages; mathematical competence and basic competences in science and technology; digital competence; learning to learn;

Period	Historical context	The EU strategies	Key documents on LLL/AET	The objectives of LLL/AET
			development, active citizenship, social inclusion and employment	social and civic competences; sense of initiative and entrepreneurship; cultural awareness and expression A number of themes are applied throughout the Reference Framework: critical thinking, creativity, initiative, problem-solving, risk assessment, decision-taking, and constructive management of feelings play a role in all eight key competences

Period	Historical context	The EU strategies	Key documents on LLL/AET	The objectives of LLL/AET
2008–2018, a neoliberalist approach	Economic crisis, historical high of youth unemployment (23%)	2009 Lisbon Treaty, strengthening the role of the European Parliament	*New Skills for New Jobs: Anticipating and matching labour market and skills needs* (CEC, 2008). Upgrading skills to enhance human capital and employability is seen as key for economic recovery. Goal is to reduce the early school dropout rate to < 10% and increase the number of young people in higher education to > 40% or equivalent by 2020	The voice of private enterprise and industry have become louder over time – skills crisis (Kleibrink, 2011).
	Financial crisis (2008)		*Establishment of the European Qualifications Framework for lifelong learning* (EPCEU, 2008). Recommendation to introduce the EQF as a translation device between member states' qualifications systems, employers, and individuals	To improve and increase the mobility of workers and students and facilitate lifelong learning
	Ageing population		*Education and Training 2020* (CE, 2009), new strategy that includes common working methods and benchmarks, clear strategic objectives and principles to achieve them ("management" via data)	
	Unsatisfactory progress in implementation of education strategy, industry argued skills gap		*Validation of non-formal and informal learning* (CEU, 2012). Recommendation on validating knowledge, skills, and competences acquired both inside and outside the formal system	Validation of non-formal and informal learning outcomes can play an important role in enhancing employability, rising motivation for LLL, particularly among socio-economically disadvantaged or low-qualified individuals

Period	Historical context	The EU strategies	Key documents on LLL/AET	The objectives of LLL/AET
	EU enlargement, 28 Member States since 2013		*Rethinking Education Strategy* (EC, 2012a)	Fundamental shift towards "learning outcomes". Entrepreneurial skills and a sense of initiative need to be developed or strengthened. The EU's education and LLL policy become more utilitarian (Volles, 2016)
			Education and Training Monitor (EC, 2013; EC, 2012b), full set of indicators is launched	the skills supply is not meeting the needs of the labour market; numerous EU countries have not met the education and training objectives set forth, particularly in the areas of basic skills, early school leavers, entrepreneurship, and adult education
			A New Skills Agenda for Europe. Working together to strengthen human capital, employability and competitiveness (CEC, 2016). Three key work standards: 1) improving the quality and relevance of skills formation; 2) making skills and qualifications more visible and comparable (proposal for the revision of the EQF); 3) improving skills intelligence and information for better career choices (proposal for a revision of the Europass Framework)	Strengthening basic skills (literacy, numeracy, digital skills); acquire key competences and higher, more complex skills (special attention will be given to entrepreneurial and innovation-oriented mindsets); making VET a first choice (quality and labour market relevant vocational skills and qualifications); focus on digital skills
			Upskilling Pathways: New Opportunities for Adults (CEU, 2016)	Improve literacy, numeracy and digital competence of low skilled adults by providing flexible learning opportunities → progress towards higher EQF levels and active participation in society

Period	Historical context	The EU strategies	Key documents on LLL/AET	The objectives of LLL/AET
			The first European Vocational Skills Week. Initiative (2016) aimed at making VET for quality skills and jobs more attractive through a combination of events taking place all over Europe, locally, regionally and nationally	
			Key competences for lifelong learning (CEU, 2018). Wide range of skills and competences for employability, personal fulfilment and health, active and responsible citizenship and social inclusion	Eight key competences, all considered equally important: literacy; multilingual; mathematical and in science, technology and engineering; digital; personal, social and learning to learn; citizenship; entrepreneurship; cultural awareness and expression. Skills such as critical thinking, problem solving, team work, communication and negotiation skills, analytical skills, creativity, and intercultural skills are embedded throughout the key competences

Source: Adapted by authors, based on Volles (2016, p. 357–359)