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Promoting the Relevance of Higher Education

*Annex 2:
Literature study and indicator review*

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Contact: Nadia Manzoni

E-mail: nadia.manzoni@ec.europa.eu

*European Commission
B-1049 Brussels*

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Annex 2: Literature study and indicator review

prepared by:



Center for
Higher Education
Policy Studies



Hans Vossensteyn
Renze Kolster
Jon File

Jeroen Huisman
Marco Seeber
Martina Vukasovic

Kai Muehleck
Christoph Gwosc

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1 Introduction

This annex to the main report 'Promoting the Relevance of Higher Education' includes the international policy literature study and the review of indicators. The objective of the literature study was to provide a first insights into the policies that relate to the three dimensions of higher education relevance: personal development, sustainable employment, and active citizenship. The literature study allowed the next steps (country fiches and (country case studies) to continue with a clearer focus.

As a first stage towards making an analytical and diagnostic tool to measure countries' scores on aspects of relevance dimensions, a review of indicators was done. This review looked into internationally comparative data sources and their used indicators, while judging their validity and usability to measure aspects related to higher education relevance.

The results of the literature study and the indicator review are presented in this annex.

2 International policy literature

2.1 Introduction

This chapter provides an overview of policies adopted for promoting the relevance of higher education. The goal of this chapter is to arrive at a comprehensive, but not necessarily exhaustive, list of policy instruments used by countries worldwide that may enhance the relevance of higher education. Policy instruments were sought that are in the international (comparative) policy literature connected to our conceptualisation of relevance and typology of policy levers.

2.2 Methodology

The international policy literature review is meant to identify policies that contribute to the relevance of higher education. Given this broader focus, we opted to review mainly the international comparative policy literature that has links to the dimensions of higher education relevance: personal development, sustainable employment and active citizenship. Within the international comparative policy literature review we collected 116 documents. We explicitly searched for evaluation studies that assess whether policy levers have proven to be effective or not. The documents cover higher education in OECD countries, with a particular focus on Europe. More specifically, these are publications by or written for:

- Bologna Follow-up Group (BFUG)
- European Centre for the Development of Vocational Training (CEDEFOP)
- Council of Europe (CoE)
- European Commission; Directorate-General for Education and Culture (DG EAC)
- European Students' Union (ESU)
- European Association of Institutions in Higher Education (EURASHE)
- Eurostat
- Eurydice
- OECD
- UNESCO
- World Bank (WB)

To systematise the analysis, the collected documents were searched by using a fixed set of keywords. Table 2.1 provides an overview of the keywords used per dimension.

Given the interconnectedness of aspects related to the three dimension, the review also highlights instances in which policy levers for one of the dimension may also affect the other two.

Table 2.1: used key-words for the international policy literature review

Dimensions of HE	Clusters	Keywords
To contribute to personal development	• Educational opportunities for personal development	• personal development planning programme, learning centre, learning portfolio, honours programme, talent programme, excellence programme, broad bachelor programmes, centres for excellence, extracurricular, co-curricular, out-of-class activities, <i>Bildung</i> , liberal education
	• Measures of personal development	• self-development, sense of identity, autonomy, independence, self-efficacy, personality, character, sense of purpose, ethical standards, self-theories, study / student experience, students' health, students' well being
	• Contexts for personal development	• institutional contexts and learning environments, students' input into curriculum
To prepare for sustainable employment	• Skills and capital for employment	• foundation skills / basic skills, literacy and numeracy, transferable skills (21st century skills, teamwork, creativity, critical thinking, problem solving, lifelong learning, interdisciplinary, multidisciplinary), technical and vocational skills (effective communication, language skills, verbal / presentation skills, reporting / research skills, taking responsibility, and entrepreneurship), lifelong learning, graduate competences), skill mismatch, labour market information, countries' economic competitiveness, labour market shortages, social capital, cultural capital, cultural literacy, aesthetic appreciation, human capital
	• Educational opportunities for employability	• internship, placement, elective programme, minor programme, job attainment training, language courses, project based learning, problem based learning, student-centred learning methods, guest lectures, international experiences / internationalisation, career centre, depth / breath of learning outcomes, qualifications, new / alternative modes of study / learning
	• Making higher education institutions focus on sustainable employment	• Employers' input into curriculum, Quality assurance framework, National qualification frameworks, Professional field advisory board / sound board / advisory committees, Professional field representative bodies, International consultative bodies, Domain-specific learning outcomes, Institutions' governance bodies, performance-based funding, performance monitoring,), sustainable employment, durable employment, fulfilling employment, meaningful employment, rewarding employment, self-employment, transition to labour market, career opportunities, long-term job security)
	• The role of employers	• Recruitment policies, Recruitment practices, assessment procedures / practices)
To enable active citizenship	• Educational opportunities for active citizenship	• volunteering, service learning, innovative teaching / teaching methods, political participation, cognitive mobilisation, cognitive socialisation
	• Measures of active citizenship	• global citizenship, active citizenship, democratic values, citizenship skills / competences, intercultural skills, cultural capital / cultural literacy / aesthetic appreciation, cultural understanding, values of tolerance, multiculturalism, civic skills, political literacy, diversity, community, trust in politics, lively democracies, social justice, social rates of return, social well-being
	• Contexts for active citizenship	• curriculum development (programme content, mode of delivery and mode of assessment), internationalisation at home, public – private partnerships, civil society's input on higher education institutions' vision and education / knowledge in curriculum, pathways to and within higher education, Corporate Social Responsibility, admission to higher education / admission systems, entry requirements, equal opportunities (access, progress and completion).

2.3 Personal development

Personal development relates to a process of change and transformation at a psychological, social, cognitive and moral level. Accordingly, higher education contributes to the development of personal development skills that are primarily useful for personal growth, which are connected to three growth directions, namely a better and realistic reflection on personality/character; better understanding or awareness; as well as maturation in the sense of confidence, social maturation and assertiveness (Kuh, 1995; Kuh, et al., 1997; Kuh, 1988; Bar-On, 2001; Ryff & Keyes, 1995; Dacre Pool & Sewell, 2007). It appears that in recent times the personal development dimension is gaining increasing relevance in policy making, following a period in which there was more emphasis on the economic relevance of higher education. European higher education institutions perform well when it comes to providing an educational experience that contributes to personal development, with around 65% of European students giving a positive evaluation (Allen *et al.*, 2011). This percentage is considerably larger than the percentage of students satisfied with higher education's contribution to future careers (50%), entrepreneurial skills (20%) and job opportunities (around 50%).

In the following we review the main instruments used to stimulate the personal development dimensions.

2.3.1 Regulation

Quality assurance procedures, including **qualifications frameworks**, appear to be the main policy lever employed to spur the personal development dimension of higher education. In some European countries, quality assurance procedures have been updated in recent years to conform to the European Qualification Framework (EQF), thus including elements relevant for the personal development dimension.

Germany is implementing an eight-level national qualifications framework for lifelong learning based on learning outcomes (DQR) (UNESCO, 2015). The framework was formally launched in May 2013. The DQR was developed from 2006 on, in a collaborative effort of the Federal Ministry of Education and Research (BMBF) and the Standing Conference of the Ministers for Education and Cultural Affairs of the *Länder* (KMK) that agreed to respond to the emerging European Qualifications Framework. A broad range of stakeholders was involved, such as experts from school-based and work-based vocational education and training, continuing education and training, general education, higher education, trade unions and employers. Germany has actively supported the EQF initiative, so that the overall structure is guided by the established German concept of the ability to act (*Handlungskompetenz*). In turn, the EQF adopts a learning-outcomes perspective that is seen as an opportunity to classify German qualifications adequately and to improve opportunities for German citizens on the European labour market (Hanft, 2011). The DQR differentiates two categories of competence: professional and personal. The term competence is central to the DQR and points to the use of knowledge, skills and personal, social and methodological competences in work as well as for occupational and personal development (UNESCO, 2015). The German speaking part of Belgium has adopted the German DQR frame.

In 2011, also the Dutch Government gave its support to develop a comprehensive qualifications framework for the Netherlands (NLQF) by making reference to the EQF. All levels are defined on the basis of learning outcomes. Table 3.2 provides an overview of the type of descriptors used in the NLQF. Personal development is part of the learning and development skills section.

Table 3.1: Level descriptors in the Dutch National Qualifications Framework (NLQF) (Source: van der Sanden, et al., 2012)

NLQF descriptors				
Context		The context descriptions of the levels are used along with the described knowledge to determine the grade of difficulty of skills.		
Knowledge		Knowledge is the totality of facts, principles, theories and ways of working related to an occupation or a knowledge domain.		
Skills		Cognitive abilities (logical, intuitive and creative thinking) and practical abilities (psychomotor skills in applying methods, materials, tools and instruments) applied within a given context		
Applying knowledge	Problem-solving skills	Learning and development skills	Information skills	Communication skills
Reproduce, analyse, integrate, evaluate, combine and apply knowledge in an occupation or a knowledge domain.	Recognize or identify and solve problems.	Personal development, autonomously or under supervision.	Obtain, collect, process, combine, analyse and assess information.	Communicate based on conventions relevant to the context.
Responsibility and independence		The proven ability to collaborate with others and to take responsibility for own work or study results or of others.		

Similar Qualification Frameworks, incorporating EQF principles and a personal development component can be found also in Poland (PQF), Portugal and Romania. Beyond Europe, personal development is also regarded by the South African Qualification Authority (SAQA) (UNESCO, 2015).

2.3.2 Funding

Scholarly works recognise the strong positive impact of an international experience on students' personal development (Kauffmann and Kuh, 1984). Hence, policy initiatives and statements supporting **mobility** and international experience often incorporate in their rationales the notion that these are beneficial for personal development (Bergen Communiqué, 2005; EUROSTAT, 2009; DG EAC, 2014; also see Section 3.4). The mobility of students is financially supported by several countries.

2.3.3 Organisation

A third policy lever that can be connected to personal development within higher education is the emergence of the ideals of **excellence in teaching and learning**. In this respect two trends can be distinguished. First, institutions across Europe established departments or organisational units that are working on the enhancement of quality and teaching, often in Centres for Excellence in Teaching and Learning (CETL). Although CETLs vary in their functioning, scope, implementation and effectiveness, they can offer, inter alia, professionalisation of teachers, which would allow them to be more sensitive to students' learning and personal development (Bischof *et al.*, 2013) and additional educational opportunities to students (Saunders, et al., 2008). Institutions in e.g. England, Norway, Finland and Sweden developed CETLs through national funding schemes.

The second trend is the emergence of excellence or honours programmes in higher education, which are often extra-curricular with a limited workload (e.g. 30 EC), and

accessible by the most talented or motivated students. Besides a focus on broadening or deepening students' knowledge and skills, they often also focus on students' personal development. To assist higher education institutions to develop these types of programmes, the Netherlands introduced a national funding scheme. Such a national policy for excellence education is unique in Europe. Nevertheless, similar type of honours programmes emerged in institutions in Austria, Belgium, Denmark, Finland and Germany (Wolfensberger, 2015).

2.3.4 Information

Policy statements typically do not frame higher education performance in personal development and employability dimensions as a zero-sum game. At the same time, it is evident that much fewer countries stress the dimension of personal development on the higher education agenda than those that stress employability issues. As a matter of fact, in countries whose tertiary education is influenced by the German model of higher education, the tension between *Bildung* (personal development) and *Ausbildung* (training) has been traditionally a cause of concern. Possibly, the recent emphasis on the training component (employability) can be at the expense of personal development (Arthur *et al.*, 2007). Some scholars support that there is indeed a trade-off between the provision of academic versus vocational competences, e.g. the transmission of personal, intellectual, pure and intrinsically driven competences on the one hand, and – on the other hand – competences related to the everyday world of commerce and life-wide activities (Barnett 1994, 1997). In this regard, empirical evidence provides a mixed picture. At the country level, the two dimensions of contributing to personal development (*Bildung*) and future employment are not correlated. In other words, contributing to personal development does not necessarily go at the expense of contributing to employment. At the disciplinary level, however, humanistic fields score better in terms of personal development than employment dimensions when compared to fields like engineering and natural sciences (Allen *et al.*, 2011). Actually, many countries have tried to stimulate enrolment in disciplines that have a stronger value of employability but perform worse in terms of personal development, namely to scientific and technical disciplines rather than humanistic disciplines. In turn, information provided to enrolling students can result in an indirect effect on the balance between personal development and employability competences of the higher education student body.

2.4 Sustainable employment

Similar to – and partly overlapping with personal development and active citizenship – higher education has an important role in providing students with the right skills with which they can find and remain in employment. Key terms associated with this task are, *inter alia*, basic skills, foundation skills, transferable skills, technical and vocational skills, 21st century skills, and lifelong learning. Particularly the latter is important for employees to anticipate the ever changing skill demands of domestic and international labour markets. Higher education authorities use a variety of policy instruments to ensure that students are taught these skills and that higher education institutions know which skills are in demand. The policy levers particularly relate to organisation and information, and to a lesser extent to regulation and funding. Nevertheless, regulation in combination with organisation may have a profound impact on sustainable employment.

Overall, the link between higher education and the world of work has become increasingly prevalent. The international policy literature points to a number of policy instruments that higher education authorities and employers use to create this link. Broadly speaking, these instruments focus on the taught content and recognition of prior learning, personal capital effects, teaching methods and the role of employers in making sustainable employment possible.

2.4.1 Regulation

Regulations in connection to sustainable employment are used to make sure higher education institutions teach the “right” set of skills. Regulations also ensure that students have access to higher education and facilities that benefit their chances for sustainable employment.

Primary and secondary education have an important role in teaching basic and foundation skills. Building on and further strengthening these skills, higher education expands students’ employability by also teaching transferable skills. Across Europe, it appears that the selection of taught skills are mainly left to higher education institutions themselves. Yet, countries can influence the skills taught in higher education to some extent through **National Qualification Frameworks**. The frameworks can be used to ensure that students learn the skills appropriate for each educational level. Similarly, it may also be broadened to include additional skills that continue to be relevant throughout individuals’ lives. However, often the stated skills are of a general nature, thus providing limited specific guidance to higher education institutions. An example is the Credit and Qualifications Framework of Wales, which objectives for the entire education sector include (UNESCO, 2015, p. 402):

- enable everyone to develop and maintain essential skills;
- encourage people to become lifelong learners;
- exploit the knowledge in business and educational institutions;
- encourage business and workers to gain new skills;
- help people within their communities to develop new skills.

Traditionally, the knowledge gained by students is rewarded with a credential. Yet, individual’s human capital is not always expressed in formal qualifications. In fact, many individuals have important knowledge and skills, but do not have a matching qualification. To overcome this gap, and potentially improve the labour market opportunities of these individuals (e.g. disadvantaged minority groups, disaffected youth, and older workers), the **recognition of non-formal and informal learning** is important for the human capital to be deployed more productively (OECD, 2012). As the UNESCO (2015) study shows, arrangements that allow institutions to recognise non-formal and informal learning is part of the National Qualification Framework of many countries. The European Commission/EACEA/Eurydice (2013) report highlights the practice in Italy:

In Italy, to facilitate connections between labour supply and demand and to increase transparency in learning and the recognition of certifications, a legislative decree has established a national system for the certification of skills, including the identification and recognition of non-formal and informal learning. (Commission/EACEA/Eurydice, 2013, p. 63)

In addition to setting national qualification frameworks, countries may also have regulations in place **that allow for more direct influence of employers** into higher education institutions, study programme curricula, and higher education quality assurance frameworks. The involvement of employers at different levels, such as at study programme level, institutional level, regional or national level, in alignment with the labour market needs is axiomatic, though the practices differ from per country. In a review of countries’ policies to encourage higher education institutions to consider the demands of the labour market, the European Commission/EACEA/Eurydice (2014, p. 64) states that:

[...] the demand-side perspective focuses on higher education institutions’ need and responsibility to respond to labour market demands. This responsibility is either stated generally, or specifically refers to the need to consult employers or employers’ organisations when designing study programmes. In this case, such consultation ensures that labour market information and demand is embedded in higher education curricula. Countries only generally referring to the higher education sector’s need to respond to labour market demand are Estonia, Spain, Hungary, Romania, the United Kingdom (some universities refer to the demand more specifically than others) and Liechtenstein. Countries specifically mentioning the need to

involve or consult employers in their steering documents are Belgium (French Community), Bulgaria, the Czech Republic, Greece, Ireland, France, Italy, Latvia, Lithuania, Austria (only universities of applied sciences), Poland, Slovenia, Montenegro, Norway and Turkey.

Influence of employers on higher education institutions, in particular its **governance structures**, can be found in many countries. Countries also appear to move in this direction, thus giving external representatives greater influence in governance boards of higher education institutions (Kolster *et al.*, 2015). Finland is an example of a country where the external influence in governance boards is regulated. The law dictates that at least 40% of the members of the governance board of public universities consists of representatives external to the university.¹ Similar arrangements, although not necessarily regulated by national law, can be found in Belgium (Flanders), England, Scotland, Denmark, France, Ireland, Luxembourg, Slovenia, and Spain (Kolster, et al., 2015).

A study (Kolster & Westerheijden, 2014) looking into connections to the labour market as constructed by study programmes of professionally-oriented higher education institutions found that a number of different practices are used to get **input from employers**. In the Netherlands and Belgium (Flanders), those responsible for managing study programmes were involved – together with representatives from employers – in the establishment of domain-specific learning outcomes. These learning outcomes were translated and implemented by those involved in the study programmes. In Ireland, domain-specific learning outcomes are to a large degree set by professional field organisations, particularly if the organisation grants professional titles or requires professionals to register. In the absence of domain-specific learning outcomes, or often also in addition to the domain-specific learning outcomes, study programmes seek (additional) input to their study programmes content from the (local) professional field and/or their professional field advisory board.

With respect to access to facilities that benefit students' chances of sustainable employment, **career guidance** offered by institutions or agencies appear to be commonly used. More specifically, some countries use stimulation budgets or oblige institutions to establish career centres. Denmark is an example of the latter, yet the task is not entirely left to institutions. Denmark also has regional guidance centres that provide students and adults with information on access to higher education and the labour market.

2.4.2 Funding

Funding can be used to reward higher education institutions that have directed their attention to sustainable employment. Likewise, funding can be used to punish those institutions that have not. In the international policy literature we mainly found examples of the former; stimulating funding formulas, financial support for students, funding for facilitates (see career guidance in regulation), and financial support for lifelong learning (see lifelong learning in organisation).

To support the higher education institutions' focus on the country's human capital needs, **funding systems** have been implemented. More specifically, in Ireland meeting human capital needs is one of the system objectives, which is attached to institutional core funding and specifically targeted initiatives (De Boer, et al., 2015, p. 102).

To respond to the increasingly international dimension of the work place (Crossman, J. & Clarke, 2010), countries are actively encouraging the **internationalisation of study programmes**. Incoming and outgoing student and staff mobility are seen as important aspects in this respect. Some countries have taken, in addition to the European Erasmus programme, measures to encourage students to gain such an international experience. More specifically, several countries (e.g. Germany, Ireland, Sweden and the Netherlands)

¹ See Section 15.4 of the Universities Act 558/2009

have made the financial support to students for studies or internships abroad portable to other (European) countries (De Boer *et al.*, 2010).

2.4.3 Organisation

Policy instruments related to organisation affect the operational activities of higher education. As shown in the international policy literature, the introduced activities include new qualifications, type of study programmes and educational delivery approaches. Similarly, operational activities can also include soft steering approaches through which higher education authorities encourage higher education institutions to focus on particular skills or develop cooperation with employers.

Related to the introduction of new activities, as well as to – and perhaps primarily – to access to higher education, countries (e.g. the Netherlands and the UK) added additional **qualifications** to their higher education system, the associate and foundation degree, respectively. This type of short term (e.g. one year) programmes give access to higher education, and thus to more advanced skills, to students who otherwise would have been less likely to enter higher education. The practice in the UK has been elaborated by De Weert (2011, p. 28):

Foundation degrees were launched in 2002 in UK as a new qualification equivalent to level 5 (in the National Qualifications Framework) and they correspond to the demand-led type of education provision [...]. These programmes integrate academic study with work-based learning offering practical, accessible options for employers and employees alike. From the beginning it was set out that the foundation degree should be both ‘academically rigorous’ and ‘vocationally-oriented’, linking higher education study to the world of work.

Giving students access to professionally-oriented studies may also be facilitated through the **introduction of new higher education programmes** (e.g. in Cyprus), short-cycle programmes (e.g. in Luxembourg and the Netherlands), professionally-oriented programmes (e.g. in France), public vocational higher education institutions or universities of applied sciences (e.g. in Poland, Croatia and Austria) or institutions focusing on flexible higher education provision (e.g. in Italy) (Eurydice, 2012, p. 80). Similarly, access to higher education may also be facilitated through non-traditional forms of higher education, such as distance learning. Interesting in this respect is the Czech Republic’s Higher Education Act (111/98), which “stipulates that on-site and distance studies (or a combination) have equal validity, and all students are entitled to equal rights and benefits” (European Commission/EACEA/Eurydice, 2015b, p. 152).

The international policy literature stresses the **role of social and cultural capital** as an important pre-condition to find employment. Focussing on the role of social and cultural capital to finding sustainable employment, the Structural Reforms Working Group (2014) believes that improving the social capital and employment possibilities for all graduates is an important task of higher education. Particularly for students “who come from disadvantaged backgrounds and have little or no social or cultural capital from other sources” (Structural Reforms Working Group, 2014, p. 42). Of relevance here are the students’ living arrangements, which can be related to the organisation of higher education: “Students’ network relationships are often shaped by age and social class, as well as by the ‘distance from home’, i.e. living at home or having ‘gone away’ to study. For the former, pre-university relationships and networks are maintained, while for the latter, new relationships and networks are formed and social capital acquired, as past identities and relationships may fade away” (Brennan, *et al.*, 2014, p. 41). The above discussion implies that higher education in some way or another contributes to students’ social and cultural capital. Perhaps related to this understanding of the role of higher education is our finding that not many policies are explicitly focussing on the improvement of students’ personal capital through higher education.

Improvement of social and cultural capital is more often associated with other – perhaps broader – policies. The key example here is **equal access to higher education**, which is

often seen as ‘the solution’ for ensuring that those qualified can reap all the benefits – including the gains in cultural and social capital – of higher education (Papanagnou, 2011). On the topic of access, Shapiro, et al. (2011, p. 9) state: “Community colleges play a central role in local economic development all over the USA and often offer a range of extension services to enterprises, and many play a central role in promoting equity and in social capital formation at the local level.” Consequently, the types of institutions and their given function may play an important role in the creation of students’ social and cultural capital.

Related to the content of higher education and the ability to stimulate gains in social and cultural capital are **policies that ensure higher education is developed in cooperation with employers** (Structural Reforms Working Group, 2014). Similarly, the degree to which higher education help students (and in the case of the reference: adult learning) to establish social networks (Italy and the Netherlands), create new social contacts, organises social events (Germany and Spain) and facilitate placements / internships (UK), may impact students’ social capital (Yang, et al., 2015, p. 83). Of important may also be the usage of ICT:

Young people are already experiencing the new forms of socialisation and social capital acquisition that ICT developments are contributing to. Their education, both at school and at home, needs to provide them with the social values and attitudes as well as with the constructive experiences that will allow them to benefit from these opportunities and contribute actively to these new spaces of social life. (Ananiadou, & Claro, 2009, p. 5).

At the study programme level, there are countries, such as Lithuania, Hungary and Slovenia that highlight the importance of **practical training**. For example, in Lithuanian higher educational institutions, many partnerships are established with employers in order to boost practical opportunities for the students through which they gain work-related experience before graduation. In Hungary, many higher education institutions have a compulsory traineeship period. Other practices that give students similar opportunities include (CEDEFOP, 2015c): Career start (Bulgaria), Work practice (internship) schemes (Estonia), the apprenticeship and craft jobs initiative (Italy), the scheme for job placement and training of tertiary education graduates (Cyprus), pre-employment contract and work experience (Luxembourg), training and apprenticeship contracts (Spain), JobBridge scheme (Ireland) and employment internships (Portugal). Policy initiatives may also stimulate higher education graduates to gain work experience after completing higher education. An example of such a policy can be found in Croatia, where the “the Employment Promotion Act (2012) provides opportunity for employers to contract, up to a total of 12 months, higher education graduates with no prior work experience using the so called ‘agreement on professional training for work without employment’ scheme. During this period, employers are exempt from paying any taxes and other contributions (health insurance, etc.) for these employees and such trainees receive from the state the monthly fee of about EUR 200” (European Commission/EACEA/Eurydice, 2014, p. 70).

The Europe 2020 strategy has paid considerable attention to **entrepreneurship and self-employment** as key to achieving smart, sustainable and inclusive growth. In its Entrepreneurship 2020 Action Plan, the EU encourages member states to embed the key competence entrepreneurship across primary, secondary, vocational, higher and adult education curricula before the end of 2015. More specifically:

A review from 2012 assessed how EU countries were strategically addressing entrepreneurial skills. It found that countries varied significantly in terms of strategy development and implementation. Some have strategies dedicated to entrepreneurship education while others have developed entrepreneurship education through wider policies e.g. national curriculum frameworks; others are still in planning stage. Overall, the review found a wide variety in practice in terms of curriculum, teacher preparation and assessment. The review concluded that ‘there is a significant need for Member States to embed and deepen implementation of entrepreneurship education. (European Business Forum Report, 2014; P. 15)

The European Commission recognises **lifelong learning** as a solution to improve skills and sustain employment for adults. The commission, thus, set a target for adult participation and measures the extent to which Member States are striving to achieve the target. The policies through which countries aim to reach the lifelong learning targets include (European Commission/EACEA/Eurydice, 2013; p.66):

- Improving career guidance (used by almost half of the EU member states, countries not specified);
- Flexible provision and pathways in lifelong learning (Belgium – Flemish Community, Germany, Estonia, Greece, Spain, France, Latvia, Malta, Finland and Sweden);
- Financial support (Estonia, Spain, Lithuania, Luxembourg, Hungary, Austria, Slovenia, England, and Scotland);
- Awareness-raising activities (Bulgaria, Estonia, Luxembourg and Finland).

As outlined above, employability of students can be enhanced through teaching the “right” skills. These efforts may be supported by specific teaching and educational opportunities. More specifically, special **didactical approaches** and dedicated programmes or modules higher education can provide students opportunities to gain valuable employability skills and experience. One such approach is student-centred learning. Many European countries are actively encouraging this teaching approach, through issuing methodological guidance materials (Armenia, Azerbaijan, Latvia, Poland, Serbia and Ukraine), allocating national or EU funding (the Flemish Community of Belgium, Croatia, Estonia, Finland, Lithuania, Romania, Spain and Sweden), or making attendance to the training on implementation of student-centred learning mandatory for some groups of staff (Albania, Austria, the French Community of Belgium, Bosnia and Herzegovina, the Czech Republic, Iceland, Ireland, Latvia, Moldova, Romania, Turkey and the United Kingdom – England, Wales, Northern Ireland and Scotland) (Eurydice, 2012, p. 51).

2.4.4 Information

Higher education authorities have an important role in providing information on conditions that may influence institutions’ approaches to sustainable employment. Although largely outside the scope of national policies, employers have a similar function. In terms of information, countries have directed resources to attain and provide comparative information relevant for access to higher education, outcomes of higher education and needs of the labour market.

Higher education agencies can support higher education institutions by **providing information** on selecting the right skills to teach, as well as support students on their path to finding sustainable employment. Moreover, several countries have outlined the labour market demands for skills in **employment strategies**. Examples include England (Rigour and Responsiveness in Skills; Skills for Sustainable Growth), Wales (Policy Statement on Skills) and Northern Ireland (Success through Skills: Transforming Futures). Furthermore, the relationship between higher education and the labour market has been researched very extensively. Among the most important sources for higher education policy at the national level are: the Destinations of Leavers from HE (DLHE) survey six months respectively 35 months after graduation; the biennial National Employer Skills survey by the UK Commission for Employment and Skills (UKCES); and the Employer Perspectives Survey (also on a biennial basis by UKCES).

Looking at the human capital available in a country the concept of the **human capital stock** is used. Ideally the human capital stock is in line with the human capital needs of the labour market (Cedefop, 2015c). Knowing and predicting trends in countries’ human capital needs is important for higher education to educate students for sustainable employment. To do so, several countries have invested resources to develop methodologies to improve forecasting and anticipation of future skills, typically with a

medium to long term perspective. Examples can be, *inter alia*, found in France (*Observatoires prospectifs des métiers et des qualifications*), Germany (Frequenz.net) and in the UK (British Sector Skills Councils) (Shapiro, et al., 2011). Likewise, although more related to Vocational Education and Training, Malta:

Aims to identify the specific skill needs and current gaps in 10 different sectors (pharmaceuticals and chemicals, financial services, ICT, furniture, printing, infrastructure, food, beverages, maritime and plastics and tourism sectors). As a follow-up, training and education programmes are adapted according to the findings of the sectoral research groups. (Cedefop, 2015c, p. 64)

Labour market statistics may not only be used as input for higher education institutions, but they can also be part of the guidance system for students or graduates. Consequently, this would allow students and graduates to make more informed choices about study choices and labour market opportunities. Denmark provides an example of this with its 'Education Guide' website that, *inter alia*, provides information on labour market conditions and statistics as does the Dutch Student Choice Information System (Studiekeuze123).

The labour market statistics often identify that countries have a **shortage of STEM graduates**, whereas these are of high importance to countries' knowledge economies. To address this, countries have started promotional campaigns. One of these countries, highlighted in a European study, is Austria, which started several initiatives, some of which had a particular focus on attracting and supporting female STEM talents (Danish Technological Institute, 2015).

Information can also cover **good practices towards employability**. An example of this can be found in Germany, where the *Hochschulrektorenkonferenz* has launched the project Nexus (*Konzepte und gute Praxis für Studium und Lehre*). This project, supported by the *Ministerium für Bildung und Wissenschaft*, will collect, systemise and disseminate information, concepts and good practices from universities.

To assure a proper link between study programmes and the labour market, the **learned competences** need to be – to some extent – **in line with demands of employers**. Yet, this does not necessarily lead to sustainable employment. For this, employers' recruitment expectations, recruitment practices, and opportunities for further training also need to be aligned with the graduates' competences (Cedefop, 2015a). When there is no alignment, skill mismatch can be the result. To prevent this, employers have an important role, in particular through their recruitment expectations, recruitment practices, and providing further training opportunities.

The main policy instruments to align the **employers' expectations** with the graduates' competences are **qualification frameworks**. UNESCO's 2015 report on Regional and National Qualifications Frameworks, mentions in this respect, *inter alia*, the Qualification Framework of Hong Kong (HKQF), which is developed so that there is convergence with employers' expectations and practical usability in recruitment practices. The development of the qualification framework can be attributed to:

Stakeholders and partners from various industries have supported and participated actively in the development of the HKQF, providing the valuable human resources needed in a knowledge-based economy; A total of nineteen ITACs/CITAC have been set up under the HKQF, covering about 52 percent of the total labour force in Hong Kong; Some industries have applied the results of the HKQF to their work, designing training courses in accordance with HKQF competency standards and applying these standards to human resource management (such as in designing recruitment advertisements, commending staff, formulating job descriptions, deploying manpower and organising internal training), or using the standards as references for performance benchmarking. (UNESCO, 2015, p. 149)

Qualification Frameworks can serve as information tools, which inform employers on the knowledge, skills and competences of graduates. Assessments of higher education learning outcomes can have a similar function. An example is Australia, where the Government

promotes the Graduate Skills Assessment test to employers and supports its use as a standard recruitment tool (Nusche, 2008). With the information sources, employers can set recruitment expectations, adjust recruitment practices and tailor-make further training programmes. In this respect, Cedefop (2015c, p. 68) mentions Estonia, which introduced a standardised process to improve the design of curricula and training programmes. As a result, Estonian company recruitment and vocational guidance and counselling for young people improved. Likewise, the standards also facilitated the international comparison of qualifications provided in Estonia. Related to foreign qualifications, European employers tend to be reluctant to hire graduates from other EU countries (Danish Technological Institute, 2015), with the exception being employers in highly knowledge-intensive sectors, such as ICT, biopharma, and digital communication (Shapiro, et al., 2011).

Recruitment practices differ per country and between types of employers. To what extent the practices can and are influenced by policy instruments, like qualification frameworks, remains unclear, but it would be of interest to explore this. One study reported that employers in some countries may attach more importance to factors such as the graduates' attended university, subject studies, personal qualities and background of the individual (Arthur, et al., 2007). A generalisation appears to be that in Germany educational qualifications matter more to find employment as compared to the UK, while in France strong value is attached to "the highly differentiated higher education degree which functions as a validation of knowledge and skills" (Arthur, et al., 2007, p. 21) Further differences in recruitment practice could be related to company size:

In Germany as elsewhere, most large national or international companies have highly structured recruitment procedures whereby those with a Masters degree are selected to enter fast track training programmes. Smaller and medium-sized companies (SMEs) are much more flexible in their employment policies. They tend to hire staff according to job requirements. It was noted that companies did not only need the very best graduates, the highest achievers, but they also needed able graduates with good average grades for a range of different jobs. Many employers have a high regard for the achievements of the Fachhochschulen with their vocational orientation and knowledge of the labour market. (Arthur, et al., 2007, p. 18).

In depressed labour markets, employers may inflate recruitment criteria. For example, by increasing the required work experience or inflating the demanded skills. Particularly the latter could lead to graduates being hired for jobs for which they are overqualified (Cedefop, 2015b). Similarly, in times of economic uncertainty, employers appear to offer new recruits short term contracts (Danish Technological Institute, 2015). Note that governments can also set more stringent quota on recruitment of employees for public sector jobs (e.g. social care workers in Ireland; Kolster & Westerheijden, 2014).

The extent to which further **training opportunities** are offered also appears to be country and sector specific. In its report on employment opportunities of STEM graduates, the Danish Technological Institute (2015) notes that companies in the UK reduced the offering of company based training in recent years, while increasingly looking for new employees that can match demands on all parameters.

2.5 Active citizenship

The specific aspects of this dimension of higher education relevance comprise, firstly, development of intercultural skills, cultural literacy and instilling the values of tolerance, multiculturalism and diversity as well as a sense of global citizenship. Secondly, preparation for active citizenship in democratic societies also includes development of political literacy, increasing the interest and motivation for political participation (voting, political party or NGO activism), providing opportunities for volunteering and service learning.

However, apart from supporting students and graduates in acquiring the necessary knowledge and skills and instilling them with specific norms and values, this dimension of

higher education also concerns the extent to which higher education contributes to social justice by assuring equal opportunities for students in terms of access, progress and completion. However, these challenges are in part related to access, progress and completion of prior stages of education. Thus, policy levers addressing this aspect of active citizenship may not be targeting higher education alone.

Furthermore, aspects of this dimension are also closely linked to the other two, e.g. intercultural skills are often mentioned also in relation to employability, while values of tolerance, interest in and motivation for political participation etc. are also connected to personal development (see above). Moreover, policy levers concerning the active citizenship dimension of higher education relevance often touch upon more than one group of aforementioned aspects. Thus, the contribution of higher education to active citizenship concerning the development of intercultural skills, political and cultural literacy and promotion of values of multiculturalism, tolerance, and diversity, often appears as one generic aspect in international policy literature.

2.5.1 Regulation

Some countries explicitly list aspects pertaining to the active citizenship dimension – intercultural skills, political and cultural literacy etc. – amid **generic competences in national qualification frameworks** (CEDEFOP, 2015a, 2015c; UNESCO, 2015). In cases in which accreditation of study programmes may depend on the extent to which they are deemed appropriate for acquiring such competences or in cases in which there is some central steering of curricula in HE, NQFs have a primarily regulative character. For example, in the case of India, the generic competences are referred to as ‘core skills – soft and interpersonal skills’ and for the highest level in the Indian NQF include ‘understanding of social and political environment’ (UNESCO, 2015), clearly reflecting aspects of active citizenship (in particular cultural and political literacy). Another example are the 15 Caribbean states that have developed a regional qualifications framework (CARICOM RQF or CQF, see UNESCO, 2015). It foresees that qualifications at each of the eight levels need to be described in relation to five domains, including ‘working with others’ which can be linked to both personal development as well as aspects of active citizenship (intercultural skills, cultural literacy etc.)

Given that one aspect of active citizenship concerns increasing interest and motivation for **political participation**, there is a generally held belief that providing opportunities for such activities and recognising them as a valuable part of the higher education experience is important (BFUG Structural Reforms WG, 2014). Thus, higher education institutions may encourage e.g. participation of students in institutional governance, student unions, volunteering and service learning, as is the case with the University College London (DG EAC, 2012). These activities can be organised as part of the curriculum, but are more often considered extra-curricular activities. While such activities do not constitute policy levers themselves (they operate on the institutional, not system level), they do rely on a supportive legislative framework (as well as funding and organisation, see below). However, these may not be a given, in particular in countries in which there is quite limited flexibility of study paths and in systems which are based on the assumption that the vast majority of students do not have any extracurricular activities and/or take up the full workload of courses during an academic year. With this in mind, although not explicitly mentioned in the international policy literature, one could conceive that other policy levers concerning the active citizenship dimension of relevance of higher education would then also include degree structures and credit systems supporting students who wish to take up political, cultural social or community roles, as well as accreditation and evaluation standards that support (or at least do not forbid) extracurricular activities.

In cases where such levers may not be present, **recognition of non-formal and informal learning** is seen as an important tool, for both admission to and progress in higher education (European Commission/EACEA/ Eurydice, 2014, 2015a). Recognition of non-

formal and informal learning relies upon regulative instruments – namely the CoE/UNESCO Lisbon Recognition Convention and the national regulation concerning recognition of qualifications and parts of studies – as well as an informational and organisational element (see below).

2.5.2 Funding

Concerning **boosting access to higher education**, governments tend to focus on higher education funding, as well as on organisation and information (European Commission/EACEA/ Eurydice, 2014; OECD, 2015b, 2015d). Concerning funding, this may include specific incentives for institutions which enrol higher proportions of students belonging to under-represented groups (as is the case in UK), grants and loans or tuition fee waivers for under-privileged students (e.g. in Flanders tuition fees for students from poorer socio-economic background are lower), or the provision of additional study places in universities of applied sciences (e.g. Austria).

Compared to issues of access, progress and completion appear to receive less attention from national policy makers. This may lead to the situation in which measures introduced for widening access to higher education, if not followed up by similar measures addressing progress and completion, can actually have an overall negative effect in terms of high drop-out for students from under-privileged backgrounds (Vossensteyn *et al.*, 2015). This brings to the forefront the extent to which the higher education system is organised in a way that allows students to change their specialisation or type of higher education (university vs. non-university) without penalising them (European Commission/EACEA/ Eurydice, 2014). That said, while in some countries there are also policy levers that are designed to ‘discipline’ students who may be having difficulties with progress and completion such as negative financial incentives, e.g., charging additional fees or losing specific benefits (European Commission / EACEA / Eurydice, 2014). These may, according to some stakeholders, actually have the opposite effect, in particular when applied to students with a lower socio-economic background (BFUG, 2008).

Another set of important funding instruments concerns **boosting political participation**. Apart from the regulation described above, there can also be financial incentives targeting both institutions and students that enable volunteering, service learning etc. to be part of the regular curriculum, in the form of additional funding for institutions or special scholarships for students.

2.5.3 Organisation

Concerning the recognition of non-formal and informal learning, regulation that supports this process is often accompanied by an agency or department within a ministry that deals with recognition issues.

Another set of policy levers primarily relates to organisation concerns about **how the transition from secondary to higher education is organised**. Thus, some countries have introduced changes in admission procedures and exams (e.g. Finland, Hungary and Turkey), provide guidance for students when choosing higher education (e.g. the Netherlands), and set quantitative targets for enrolment of under-represented groups (e.g. Armenia, Austria, Ireland, Finland and Norway; Eurydice, Educational, Audiovisual, & Culture Executive Agency, 2012). Of importance in this discussion may also be the division of authority in the countries’ admission procedures to higher education system. While most European countries grant a substantial role to higher education institutions, some (e.g. Norway, Hungary, France) opted for a more centralised approach that allows for a more direct control on the equal distribution of students across the system (Vossensteyn, *et al.*, 2015). It should be stressed that the extent to which such levers are effective is not always clear, but that they have been introduced with an explicit expectation that they would contribute to widening access.

2.5.4 Information

Concerning instruments that are primarily informative in nature, Council of Europe's (CoE) long standing work on competences for democratic citizenship and human rights education,² focuses on pre-higher education primarily. They offer manuals, compendia of good practice and trainings for teachers and address these topics both as self-standing subject(s) and as parts of other subjects (e.g. social studies, history, etc.). In this light, higher education experience is expected to contribute to strengthening and refining competences students have begun to acquire already in primary and/or secondary education.

In addition, as already indicated, NQF can serve an information purpose (apart from the regulative one, see above), in clarifying learning outcomes of various qualifications. In the context of active citizenship, this is particularly relevant for competences such as intercultural skills, cultural and political literacy, etc., and for supporting the process of recognition of non-formal and informal learning.

2.6 Summary and conclusion

The policy instruments discussed in this chapter are grouped under the type of policy lever that fit best. It should be noted that this is a classification made for clarity purposes. That is, policy instruments grouped in one type of policy lever may actually also have implications for other type of policy levers. For example, if institutions that begin to offer programmes for newly introduced qualifications (e.g. associate degrees or professional-oriented programmes), this would be an example of regulation. But in case there are financial rewards to set up such programmes, it fits the financial lever policy type as well. Similarly, information gathered through alumni or graduate destination surveys may also be used in the funding formulas for higher education institutions.

As shown in Table 2.3, we see that governments appear to use quality assurance and qualification framework (regulation and information) to encourage higher education institutions to focus on students' personal development. Some efforts can also be related to funding and organisation (in particular CETLs). Governments mainly use policy instruments related to organisation and information to address sustainable employment. Yet, particularly the instruments under regulation and organisation may have the most impact on sustainable employment. Concerning active citizenship, the governments rely on all four types of policy levers. Specific measures adopted actually fall under several categories, e.g. national qualifications frameworks have a regulative as well as informative purpose for active citizenship (and also have a role to play concerning the other two dimensions, see above). In addition, some of the measures are inter-connected, e.g. recognition of non-formal and informal learning relies on national qualification framework.

Table 2.3: Policy instruments found in the international policy literature grouped according to type of policy lever

TYPICAL POLICIES	REGULATION	FUNDING	INFORMATION	ORGANISATION
PERSONAL DEVELOPMENT	<ul style="list-style-type: none"> - Quality Assurance procedures - National Qualification Frameworks 	<ul style="list-style-type: none"> - Funding supporting mobility - Development of CETLs through national funding schemes 	<ul style="list-style-type: none"> - Information spurring enrolment in STEM - Results of the Quality Assurance procedures and National Qualification Frameworks 	<ul style="list-style-type: none"> - Departments or organisational units that are working on the enhancement of quality and teaching, often in CETLs - Excellence or honours programmes
SUSTAINABLE EMPLOYMENT	<ul style="list-style-type: none"> - National Qualification Frameworks 	<ul style="list-style-type: none"> - Financial support for internationalisation 	<ul style="list-style-type: none"> - Comparative information on access 	<ul style="list-style-type: none"> - Additional qualifications (associate /

² <http://www.coe.int/en/web/edc/home> (accessed 8 August 2016). See in particular the CoE model competences for democratic culture.



	<ul style="list-style-type: none"> - Recognition of non-formal and informal learning - Mandatory career guidance centres - Hard approaches to ensure higher education is developed in cooperation with employers (e.g. mandatory involvement in governance structures, in curriculum development or in setting of domain-specific learning outcomes) 	<ul style="list-style-type: none"> - Funding formula for higher education institutions to ensure institutions focus on national priorities - Funding for facilities that benefit students' changes for sustainable employment - Financial support for lifelong learning 	<p>to higher education and the labour market</p> <ul style="list-style-type: none"> - Sharing good employability practices - Alumni / graduate destination surveys - Forecasting demands in skills - Promotional campaigns to attract students to certain fields (often STEM) - National Qualification Frameworks 	<p>foundation degrees / short-cycle programmes)</p> <ul style="list-style-type: none"> - Professionally-oriented higher education - Alternative study programmes (distance learning, flexible higher education provision - Teaching approaches to facilitate learning of skills related to sustainable employment - Focus on particular skills (entrepreneurship, self-employment, lifelong learning) - Soft approaches to ensure higher education focuses on sustainable employment (e.g. curricula developed in cooperation with employers and promoting curricula to include internship periods)
<p>ACTIVE CITIZENSHIP</p>	<ul style="list-style-type: none"> - National Qualification Frameworks - Regulation that allows extracurricular activities (e.g. volunteering) - Recognition of non-formal and informal learning (including international conventions, such as Lisbon Recognition Convention) 	<ul style="list-style-type: none"> - Financial incentives for HEIs for widening access - Grants, loans and tuition fee waivers for students from poorer socio-economic background - Financial disincentives for poor progress 	<ul style="list-style-type: none"> - National Qualification Frameworks - Sharing good practices concerning competences for democratic citizenship - Recognition of non-formal and informal learning 	<ul style="list-style-type: none"> - Admission procedures and exams supportive of students from poorer socio-economic backgrounds - Student guidance

3 Review of Indicators for Measuring the Relevance of Higher Education

3.1 Introduction

This chapter presents the review of indicators that address the relevance of higher education. This indicator review particularly addresses the question of how the relevance of higher education can be measured, visualised, and monitored. The objective is to provide an overview of the state of the art regarding monitoring the relevance of higher education in Europe and some interesting benchmark countries. To this end, the chapter predominantly explores the availability of existing international comparative indicators that grasp the essence of the relevance of higher education in countries. Based on such an overview, one not only can identify aspects of relevance that are well-covered, but also aspects which cannot be measured satisfactorily with available statistics or that are, to the best of our knowledge, not addressed with statistical monitoring indicators so far.

3.2 Methodology

In accordance with the scope of the HEREL project, the review focusses on *monitoring* information at the level of countries. Such aggregated indicators can give indications of the relationship between higher education and a potential result of higher education. But, as mentioned, monitoring indicators are not suitable for detecting causal relationships or the net effect of higher education on a certain outcome. Thus this review does not give an account on the state of the art of the *effects* of higher education.

The review is based on extensive research of *international data resources*. International sources already offer a broad bandwidth of indicators and international data providers like the OECD or Eurostat make considerable efforts to collect and make comparable data collected at national level. Still national-level data may well offer additional indicators not covered by the present review.

The review covers a considerable number of data sources and we have strived towards retrieving indicators for all dimensions of higher education relevance set out previously in the project. The review identifies aspects for which no or only few indicators were detected. However, despite all efforts some indicators may have been overlooked.

Finally, the overview of indicators is *by no means exhaustive*. The potential number of indicators of the relevance of higher education is enormous and the options of building variations of indicators, e.g. by choosing different categorisations or grouping variables nearly endless. If available, the project team gave primacy to ‘well-established’ indicators in the sense of being (repeatedly) published in large and well-known international sources. Very similar indicators of other sources have not been listed to avoid an unclear presentation. Furthermore, the project team went for the indicator with the most parsimonious grouping, typically “by educational attainment”. Further groupings, e.g. by sex, age groups etc. are often possible but have not been listed.

3.3 Indicators on personal development

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ³	Data quality & validity	Reason for choice	Comment
Attitudes towards self and perception of self (sense of identity, self-respect, self-worth, self-efficacy)	Self-perception by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes. In general: Data from 6 waves are available (1984-2014). Each wave takes between 3 and 5 years).	Yes, across countries	Generally up to 61 countries worldwide for the wave 2010-2014 (13 European countries including Russian Federation and Turkey)	Samples per country drawn in different years, Sample size per country sufficiently high, but for individual educational sub-groups N can be smaller than 30 cases, provision of percentages, mean and standard deviation. With respect to HE differentiation between university-level education with/without degree.	Periodical; captures aspect well	Seeing oneself as someone who: e.g. is reserved, is generally trusting, tends to find fault with others, does a thorough job
	"In general I feel very positive about myself" by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	No (only data for 3 rd and 6 th round available, 2006 and 2012). In general: Data from 7 waves are available (2002-2014). Each wave takes 2 years).	Yes, across countries	29 mostly European and countries (6 th round), 23 European countries (3 rd round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). For 3 rd round, ISCED levels 5 + 6 were summed up.		Item measured on 5-staged scale ranging from "agree strongly" to "disagree strongly"
	"There are lots of things I am good at" by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	No (only data for 6 th round available, 2012)	Yes, across countries	29 mostly European countries (6 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols.		Item measured on 5-staged scale ranging from "agree strongly" to "disagree strongly"

³ In case of periodical data, the geographical coverage refers to the most current data. In case the indicator comprises several sub-indicators, the geographical coverage may vary as data for certain sub-indicators may not be available for all countries.

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ³	Data quality & validity	Reason for choice	Comment
						Differentiation by all ISCED levels (based on ISCED 1997).		
Responsible employees	"I see myself as someone who does a thorough job" by highest educational attainment level and employment status	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Item measured on 5-staged scale ranging from "agree strongly" to "disagree strongly", employment status: e.g. full-time, part-time, self-employed
	"Main reason I put effort into my work: It is everyone's duty to always do their best" by highest level of education (in % of all respondents)	European Social Survey http://www.europeansocialsurvey.org/data/	No (only data for 5 th round available, 2010)	Yes, across countries	27 mostly European countries (5 th round)	See above		
	"Importance in a job: responsible job" by highest level of education	European Values Survey http://www.gesis.org/en/services/data-analysis/survey-data/rdc-international-survey-programs/european-values-study/	Yes. In general: Data from 4 waves are available (1983-2010). Survey is executed every 8-10 years.	Yes, across countries	47 European and Non-European countries (4 th round 2010) with N > 30 for ISCED 5A for each country.	A representative multi-stage or stratified random sample of the adult population of the country 18 years old and older (except Armenia 15+ and Finland 18 to 74 years) was used for the EVS 2008. Differentiation by all ISCED levels (based on ISCED 97).		Item measured as binary variable ("mentioned" or "not mentioned")
Trust in others, cooperative spirit, cooperative spirit in company, good teamwork, & level of trust in neighbourhood and society	Likelihood of reporting to trust others by educational attainment	OECD 2015a, Table A8.3a, p. 163.	Yes expectedly	Yes, across countries	20 OECD countries and 4 subnational entities	PIAAC data is of good quality; indicator measures the attribute well; a connection to HE is made.		Expectedly, PIAAC will only be repeated at long intervals, e.g. every 10 years
	Extent of trust in other people by highest level of education ("Most people can be trusted or you can't be too careful")	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall	Periodical; measures aspect of grad.; captures aspect well	Item measured on 11-staged scale ranging from "you can't be too careful" to "most people can be trusted"

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ³	Data quality & validity	Reason for choice	Comment
						below 30 (does not hold for sum of ISCED 5A).		
	Assessment of cooperative spirit in society by highest level of education ("Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?")	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).	Does not directly measure aspect of grad. but perception of soc.	Item measured on 11-staged scale ranging from "people mostly look out for themselves" to "people mostly try to be helpful"
	Importance of helping other people and caring for others well-being by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).	Periodical, captures aspect well	Item measured on 6-staged scale ranging from "very much like me" to "not like me at all"
Values (ethical standards)	Justifiability of different actions by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSOnline.jsp	Yes	Yes, across countries	See above	See above	captures aspect well	Actions: e.g. misuse of government benefits, free-riding on public transport, acceptance of bribe, abortion, suicide
	Importance of people being treated equally and having equal opportunities by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).	Could be one sub-dimension	Item measured on 6-staged scale ranging from "very much like me" to "not like me at all"
	Clear or no clear guidelines about what is good and evil	European Values Survey http://www.gesis.org/en/services/data-analysis/survey-data/rdc-international-survey-	Yes (every 9 years)	Yes, across countries	47 European and Non-European countries (4 th round 2010) with N > 30	A representative multi-stage or stratified random sample of the adult population of the country 18 years old and older (except Armenia 15+		Response categories: "clear guidelines", "clear guidelines but deviation

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ³	Data quality & validity	Reason for choice	Comment
		programs/european-values-study/			for ISCED 5A for each country.	and Finland 18 to 74 years) was used for the EVS 2008. Differentiation by all ISCED levels (based on ISCED 97).		sometimes justified", "no clear guidelines"
Motivation, motivated employees	Most important aspects of education by level of education (motivation of learners as one item)	Eurobarometer 2014, p. 26, 27.	Unknown	Yes, across countries	28 EU-Member States	Data based on 27,998 cases, but question refers to education system as a whole (not to HE in particular)	Low content validity as indicator does not measure the motivation of the grad. him or herself	
	Plans for continuation of studies after finishing current study programme(s).	Eurostudent 2015, http://database.eurostudent.eu/	Yes (data also available for 4 th round, 2008-2011, and prospectively for the 6 th round, 2015-2018)	Yes, across countries	27 EHEA countries	Data based on student survey, for some smaller countries the sample size is comparatively small (N < 2,000), countries differ by survey method.		Data differentiate by type of degree, type of HEI, study intensity, field of study, sex, educational background, age, and dependency on income source. Not all data available for all Eurostudent countries.
	"Main reason I put effort into my work" by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	No (only data for 5 th round, 2010)	Yes, across countries	27 mostly European countries (5 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997).		Response items: be satisfied with what I accomplish, my work is useful for other people, get a higher wage or promotion, my work tasks are interesting, it is everyone's duty to always do their best
	"I would enjoy working in my current job even if I did not need the money" by highest level of education.	European Social Survey http://www.europeansocialsurvey.org/data/	No (only data for 5 th wave, 2010)	Yes, across countries	27 mostly European countries (5 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED	Captures the aspect in terms of intrinsic motivation ; other forms of	5-staged response scale ranging from "agree strongly" to "disagree strongly"

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ³	Data quality & validity	Reason for choice	Comment
						levels (based on ISCED 1997).	motivation are not covered.	
Health, well-being, healthy employees, level of health	Likelihood of reporting to be in good health by educational attainment	OECD 2015a, Table A8.1, p. 161.	Yes expecte dly	Yes, across countrie s	20 OECD countries and 4 subnational entities	PIAAC data is of good quality; indicator measures the attribute well; a connection to HE is made.		Expectedly, PIAAC will only be repeated at long intervals, e.g. every 10 years
	Practice of daily physical activity by sex, age and educational attainment level (%)	European Commission, Eurostat 2016, European Health Interview Survey (EHIS) http://ec.europa.eu/eurostat/data/database	No (only data for 2008)	Yes, across countrie s	11 European countries	Eurostat data is of good quality, differentiation for various education levels possible (based on ISCED 97)		
	Consumption of fruits & vegetables by sex, age and educational attainment level (%)	European Commission, Eurostat 2016, European Health Interview Survey (EHIS) http://ec.europa.eu/eurostat/data/database	No (only data for 2008)	Yes, across countrie s	16 European countries	Eurostat data is of good quality, differentiation for various education levels possible (based on ISCED 97)		
	Daily smokers by number of cigarettes by sex, age and educational attainment level (%)	European Commission, Eurostat 2016, European Health Interview Survey (EHIS) http://ec.europa.eu/eurostat/data/database	No (only data for 2008)	Yes, across countrie s	15 European countries	Eurostat data is of good quality, differentiation for various education levels possible (based on ISCED 97)		
	Frequency of alcohol consumption by sex, age and educational attainment level (%)	European Commission, Eurostat 2016, European Health Interview Survey (EHIS) http://ec.europa.eu/eurostat/data/database	No (only data for 2008)	Yes, across countrie s	14 European countries	Eurostat data is of good quality, differentiation for various education levels possible (based on ISCED 97)		
	Self-perceived health by sex, age and educational attainment (%)	European Commission, Eurostat 2016, EU-SILC, http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countrie s	31 European countries and two EU aggregates	Eurostat data is of good quality, differentiation for various education levels possible (based on ISCED 2011)	periodical; captures aspect well; summary measure; disadvantage: subjective assessment	5-staged answer scale ranging from "very good" to "very bad"
	People having a long-standing illness or health problem, by sex, age and	European Commission, Eurostat 2016, EU-SILC http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countrie s	31 European countries and two EU aggregates	Eurostat data is of good quality, differentiation for various education levels		

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ³	Data quality & validity	Reason for choice	Comment
	educational attainment level (%)					possible (based on ISCED 2011)		
	Self-perceived long-standing limitations in usual activities due to health problem by sex, age and educational attainment level (%)	European Commission, Eurostat 2016, EU-SILC http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	31 European countries and two EU aggregates	Eurostat data is of good quality, differentiation for various education levels possible (based on ISCED 2011)		Level of activity limitation: some, severe, some and severe, none
	Self-reported unmet needs for medical examination by sex, age, detailed reason and educational attainment level (%)	European Commission, Eurostat 2016, EU-SILC http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	30 European countries and two EU aggregates	Eurostat data is of good quality, differentiation for various education levels possible (based on ISCED 2011)		Reasons surveyed: too expensive, too far to travel, too expensive or too far to travel or waiting list, no time, no unmet needs to declare
Happiness, level of happiness	Average rating of satisfaction by domain, sex, age and educational attainment level	European Commission, Eurostat 2016, EU-SILC http://ec.europa.eu/eurostat/data/database	No (module of 2013)	Yes, across countries	32 European countries, including EU28	Data source: EU-SILC, data is usually of good quality		Overall satisfaction and satisfaction with domains such as financial situation, job, personal relations; Item measured on 11-staged scale
	Level of happiness by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).	More European countries than WVS and more frequently done than EVS	Item measured on 11-staged scale ranging from "extremely unhappy" to "extremely happy"
	Feeling of happiness by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Response categories range from "very happy" to "not at all happy", also "no answer" and "don't know"
	Satisfaction with life by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		10-staged answer scale ranging from "completely dissatisfied" to "completely satisfied", also "no

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ³	Data quality & validity	Reason for choice	Comment
								answer" and "don't know"
	Satisfaction with various aspects of society by highest level of education.	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).		Aspects: present state of economy, national government, the way democracy works. Items measured on 11-staged scale ranging from "extremely dissatisfied" to "extremely satisfied".
Students'/graduates' satisfaction with personal development & related aspects in HE	Students' assessment of study programme as good basis for personal development	Eurostudent (2011), https://eurostudent.his.de/eiv/report/data_overview.jsp?ssid=D2E755EAAD04E01F512CDFD7A65D4030&sel_lang=&cnt_oid=1	No (only for period 2008-2011 available)	Yes, across countries	20 EHEA countries	Data based on student survey, for some smaller countries the sample size is comparatively small (1,000 < N < 2,000), countries differ by survey method		Data differentiate by type of degree, social background and field of study. Not all data available for all Eurostudent countries.

3.4 Indicators on sustainable employment, user group students/graduates

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁴	Data quality & validity	Reason for choice	Comment
Qualifications	Distribution of graduates at education level and programme orientation by sex and field of education	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	34 OECD countries, including 32 European countries and 26 countries of EU28	Eurostat data is of good quality; the indicator measures the attribute well; differentiation by three levels of tertiary education is made (ISCED 2011)		
	Graduates in tertiary education, in science, math., computing, engineering, manufacturing, construction, by sex - per 1000 of population aged 20-29	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	33 European countries, including EU28	Eurostat data is of good quality; the indicator measures the attribute well		
	Graduates at doctoral level by sex and age groups - per 1000 of population aged 25-34	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	31 European countries, including 26 countries of EU28	Eurostat data is of good quality; the indicator measures the attribute well		
	Graduates at doctoral level, in science, math., computing, engineering, manufacturing, construction, by sex - per 1000 of population aged 25-34	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	33 European countries, including EU28	Eurostat data is of good quality; the indicator measures the attribute well		
	Percentage of adults who have attained tertiary education by type of programme and age group	OECD 2015a, Table A1.3a, p. 41.	Yes	Yes, across countries	34 OECD countries and 10 partner countries	UOE data is of good quality; indicator measures the attribute well, data based on ISCED 2011, 4 levels of tertiary education distinguished.		
Knowledge								
Basic skills	Mean literacy proficiency by level of educational attainment	OECD 2013a, Table A3.9 (L), p. 285.	Yes expectedly	Yes, across countries	20 OECD countries, 4 OECD sub-national entities, 1 partner country	PIAAC data is of good quality; the indicator measures the attribute well; a connection to tertiary education is made.		Expectedly, PIAAC will only be repeated at long intervals, e.g. every 10 years
	Mean use of information-processing skills (reading, writing, numeracy, ICT, problem	OECD 2013a, Table A4.11a, p. 318/9.	Yes expectedly	Yes, across countries	19 OECD countries, 4 OECD sub-national entities, 1 partner country	PIAAC data is of good quality; the indicator measures the attribute well;		Expectedly, PIAAC will only be repeated at long

⁴ In case of periodical data, the geographical coverage refers to the most current data. In case the indicator comprises several sub-indicators, the geographical coverage may vary as data for certain sub-indicators may not be available for all countries.

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁴	Data quality & validity	Reason for choice	Comment
	solving) at work, by educational attainment					a connection to tertiary education is made.		intervals, e.g. every 10 years
	Importance of different types of skills that education should provide (basic skills as one item)	Eurobarometer 2014, p. 10, 11.	Unknown	Yes, across countries	28 EU-Member States	Data based on 27,998 cases, but question refers to education system as a whole (not to HE in particular)		
Transferable skills (communication skills, creativity, critical thinking etc.)	Proficiency in problem-solving in technology-rich environments, by educational attainment	OECD 2013a, Table A3.10 (P), p. 287.	Yes expectedly	Yes, across countries	17 OECD countries and 4 sub-national entities	PIAAC data is of good quality; the indicator measures the attribute well; a connection to tertiary education is made.		Expectedly, PIAAC will only be repeated at long intervals, e.g. every 10 years
	Mean use of information-processing skills (reading, writing, numeracy, ICT, problem solving) at work, by educational attainment	OECD 2013a, Table A4.11a, p. 318/9.	Yes expectedly	Yes, across countries	19 OECD countries, 4 OECD sub-national entities, 1 partner country	PIAAC data is of good quality; the indicator measures the attribute well; a connection to tertiary education is made.		Expectedly, PIAAC will only be repeated at long intervals, e.g. every 10 years
	Mean use of generic skills at work, by educational attainment	OECD 2013,a Table A4.12a, p. 320/1.	Yes expectedly	Yes, across countries	19 OECD countries, 4 OECD sub-national entities, 1 partner country	PIAAC data is of good quality; the indicator measures the attribute well; a connection to tertiary education is made.		Expectedly, PIAAC will only be repeated at long intervals, e.g. every 10 years
Technical & professional skills Competencies								
Cultural capital (cultural literacy, aesthetic appreciation etc.)	Persons reading books in the last 12 months by sex and educational attainment level	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	22 European countries	Eurostat data is of good quality; the indicator measures the attribute well; differentiation by three levels of education is made (ISCED 1997)		Differentiation by number of books: e.g. 1 or more, less than 5, from 5 to 9 books
	Persons reading newspapers in the last 12 months by educational attainment level	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	23 European countries	Eurostat data is of good quality; the indicator measures the attribute well; differentiation by three levels of education is made (ISCED 1997)		Differentiation by frequency: e.g. at least once, at least once a month, at least once a week
	Persons participating in cultural activities in the last 12 months by sex and educational attainment level	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	22 European countries	Eurostat data is of good quality; the indicator measures the attribute well; differentiation by three levels of education is made (ISCED 1997)	captures aspect best.	Activities surveyed: cinema, theatre and concerts, cultural sites (e.g. historical monuments, museums, art galleries, archaeological sites)

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁴	Data quality & validity	Reason for choice	Comment
	Frequency of use of information sources by highest educational attainment	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Sources: e.g. daily newspaper, printed magazines, TV news, Radio news, Internet
Social capital	Importance of family in life by highest educational attainment	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		4-staged answer scale ranging from "very important" to "not at all important"
	Importance of friends in life by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		4-staged answer scale ranging from "very important" to "not at all important"
	Importance of helping people living nearby by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Rating whether such a person is like oneself. Response categories: 6-staged answer scale ranging from "very much like me" to "not at all like me", also "no answer" and "don't know"
	How much you trust your family by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		4-staged answer scale ranging from "trust completely" to "do not trust at all", also "no answer" and "don't know"
	Seeing oneself as part of local community by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		4-staged answer scale ranging from "strongly agree" to "strongly disagree", also "no answer" and "don't know"
	Marital status by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		6 different items including "married" and "living together as married"
	Number of children by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across	See above	See above		

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁴	Data quality & validity	Reason for choice	Comment
				countries				
	Living with parents by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		
	Active membership of organizations by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Organizations surveyed: e.g. churches, sports clubs, labor unions, self-help groups, etc.
	Percentage of people who report having relatives or friends they can count on	OECD 2015c, Figure 2.28, p. 82.	unknown, but likely to be repeated	Yes, across countries	36 OECD countries	Data source: Gallup World Poll		Problem: The publication as well as the Internet tool take only account of "at least upper secondary education". It's not possible to differentiate by various educational attainment levels.
	Frequency of socially meeting with friends, relatives or colleagues by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).	seems to capture aspect best even though an indicator for the size of the social network would be better.	Item measured on 7-staged scale ranging from "never" to "every day"
	Number of people with whom one can discuss intimate and personal matters by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	See above		Item measured on 7-staged scale ranging from "none" to "10 or more"
Social prestige (associated with degree, knowledge, etc.)	Importance of being successful and that people recognize achievements by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	See above		Item measured on 6-staged scale ranging from "very much like me" to "not like me at all"

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁴	Data quality & validity	Reason for choice	Comment
	Importance of showing abilities and being admired by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).		Item measured on 6-staged scale ranging from “very much like me” to “not like me at all”
Successful transition to labour market	Unemployment ratio of tertiary education graduates aged 20-34, by the number of years since graduation	EC/EACEA/Eurydice 2015, p. 188.	Yes	Yes	34 EHEA countries	EU-LFS data is of very good quality; it is noted that samples are small for most medium and small countries; the indicator gives an understanding of successful transition but it is not clear whether graduates have been employed in the meantime; as results are not compared to overall levels of unemployment the interpretation is hard; no differentiated measurement of HE.	preferable over subjective assessment	
	Students' assessment of chances on labour market (on national and international level) after graduation from current programme	Eurostudent (2015), http://database.eurostudent.eu/	To some degree (periods 2008-2011 and 2012-2015 available)	Yes, across countries	25 EHEA countries	Data based on student survey, for some smaller countries the sample size is comparatively small (N < 2,000), countries differ by survey method.		Data differentiate by type of degree, type of HEI, study intensity, field of study, sex, educational background, age, and dependency on income source. Not all data available for all Eurostudent countries.
	Employment rates by age, sex, educational attainment level and number of years after leaving formal education	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Irregular (data from LFS ad-hoc module only available for 2009)	Yes, across countries	31 European countries plus EU-27 aggregate	Eurostat data is of good quality; the indicator approximates the attribute; differentiation by 5 categories of ISCED levels is made (ISCED 1997)		Data for ISCED 5 + 6 are summed up, with respect to number of years after leaving formal education: “3 years or less” and “5 years or less” are available

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁴	Data quality & validity	Reason for choice	Comment
	Youths transition from education to working life: Unemployment rates by time (in months) since leaving continuous education for the first time (by various ISCED levels)	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Irregular (data from LFS ad-hoc module only available for 2000)	Yes, across countries	4 European countries	Eurostat data is of good quality; the indicator approximates the attribute; differentiation by 3 categories of ISCED levels is made (ISCED 1997)		Data for ISCED 5 + 6 are summed up, differentiation by number of months: from less than 1 to 119 months
	Average time between leaving formal education and starting the first job by age, sex and educational attainment level for persons who left within the last 3 or 5 years - (months)	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Irregular (data from LFS ad-hoc module only available for 2009)	Yes, across countries	29 European countries plus EU-27 aggregate	Eurostat data is of good quality; the indicator approximates the attribute; differentiation by 5 categories of ISCED levels is made (ISCED 1997)		Data for ISCED 5 + 6 are summed up
Adequacy of employment	Distribution of people with tertiary education (ISCED 5-6) aged 25-34 across ISCO levels	EC/EACEA/ Eurydice 2015, p. 193.	Yes	Yes	37 EHEA countries	EU-LFS data is of very good quality; the indicator measures vertical (mis)match with regard to formal qualifications but relatively rough; no differentiated measurement of HE.		
	Percentage of people aged 25-34 with tertiary education (ISCED 5-6) who are vertically mismatched (ISCO 4-9) by field of study	EC/EACEA/Eurydice 2015, p. 196.	Yes	Yes, over time and across fields of study (in the report no comparison across countries possible)	(Probably) 37 EHEA countries	EU-LFS data is of very good quality; the indicator measures vertical (mis)match with regard to formal qualifications but relatively rough; it is differentiated by field of subject but no differentiated measurement of HE.	captures aspect well and differentiates by subject	
	Employed higher education graduates overqualified in their current jobs (in %)	European Commission 2015, Figure 3.4.2., p. 68. http://ec.europa.eu/education/tools/et-monitor_en.htm	Unknown (data for 2011 and 2014)	Yes	EU-28 countries	Source: Eurostat-LFS, data is of good quality, data based on ISCED 2011		
	Low-wage earners as a proportion of all employees (excluding	European Commission, Eurostat 2016,	Irregular (data available	Yes, across	33 European countries plus EU-27 and Euro area	Eurostat data is of good quality; the indicator approximates the attribute;		

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁴	Data quality & validity	Reason for choice	Comment
	apprentices) by educational attainment level (in %)	http://ec.europa.eu/eurostat/data/database	for 2006 and 2010)	countries		differentiation by three levels of education is made (ISCED 1997)		
	Youths transition from education to working life: Proportion in precarious employment by time (in months) since leaving continuous education (by various ISCED levels)	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Irregular (data from LFS ad-hoc module only available for 2000)	Yes, across countries	5 European countries	Eurostat data is of good quality; the indicator approximates the attribute; differentiation by 3 categories of ISCED levels is made (ISCED 1997)		Data for ISCED 5 + 6 are summed up, differentiation by number of months: from less than 1 to 119 months
	Job mismatches and their labour market effects among school-leavers in Europe: Incidence of job mismatches by various levels of education (in %)	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Irregular (data from LFS ad-hoc module only available for 2000)	Yes, across countries	12 European countries	Eurostat data is of good quality; the indicator approximates the attribute; differentiation by 2 categories of ISCED levels is made (ISCED 1997)		Data for ISCED 5 + 6 are summed up
Earnings	Relative earnings of workers, by educational attainment, age group, and gender	OECD 2015a, Table 6.1a, p. 125.	Basically yes	Yes, across countries	32 OECD countries, 2 partner countries	Data is of good quality; indicator measures the attribute well; a connection to HE is made.	captures aspect well; periodical	
	Private costs & benefits for men & women attaining tertiary education	OECD 2015a, Table A7.3a, p. 147, Table A7.3b, p. 148.	Yes	Yes, across countries	Both tables: 24 OECD countries	Data is of good quality; indicator measures the attribute well; a connection to HE is made.		
	Hourly wages of HE graduates (converted to PPP and Euro)	Allen/van der Velden (2007), Figure 7.7, p. 233.	No	Yes (in principal)	13 European countries	Responses based on almost 36,000 respondents in 13 countries, sample size differs between 959 and 6,763 cases		No comparison to wages of employees without HE
Career opportunities	"Current job offers good opportunities for advancement" by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	No (only data for 2 nd and 5 th wave, 2004 + 2010)	Yes, across countries	25 European countries (2 nd wave), 27 mostly European countries (5 th wave)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A resp. 5+6). For the 2 nd round of ESS ISCED levels 5 and 6 were aggregated.		5-staged answer scale ranging from "agree strongly" to "disagree strongly"

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁴	Data quality & validity	Reason for choice	Comment
Long-term job security	Employment contract with limited or unlimited duration by highest level of education.	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	See below		Response categories: limited, unlimited, no contract
	Assessment whether employer considered job to be temporary or permanent by highest level of education.	European Social Survey http://www.europeansocialsurvey.org/data/	No (only data for 5 th wave, 2010)	Yes, across countries	21 mostly European countries (5 th round), for another 6 countries N < 30 for aggregated ISCED 5A level	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). For levels below ISCED 5A, number of cases in columns may occasionally fall below 30.	captures aspect ok and more precise than 4-point scale below	Response categories: temporary < 12 months, temporary ≥ 12 months, permanent, other
	Security of current job by highest level of education.	European Social Survey http://www.europeansocialsurvey.org/data/	No (only data for 2 nd and 5 th wave, 2004 + 2010)	Yes, across countries	25 European countries (2 nd wave), 27 mostly European countries (5 th wave)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A resp. 5+6). For the 2 nd round of ESS ISCED levels 5 and 6 were aggregated.		4-staged answer scale ranging from "not at all true" to "very true"
Job satisfaction	Share of HE graduates satisfied with their job (in %)	Allen/van der Velden (2007), Figure 7.23, p. 258.	No	Yes	13 European countries	Responses based on almost 36,000 respondents in 13 countries, sample size differs between 959 and 6,763 cases		No comparison with employees without HE
	Satisfaction with main job by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	No (only data for 5 th wave, 2010)	Yes, across countries	27 mostly European countries (5 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).	more general than alternatives and more up-to-date than above	11-staged response scale ranging from "extremely dissatisfied" to "extremely satisfied"
	"I would enjoy working in my current job even if I did not need the money"	European Social Survey http://www.europeansocialsurvey.org/data/	No (only data for 5 th wave)	Yes, across countries	27 mostly European countries (5 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous		5-staged response scale ranging from "agree strongly" to "disagree strongly"

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁴	Data quality & validity	Reason for choice	Comment
	by highest level of education		wave, 2010)			translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).		
	Current job offers a lot of variety in work by highest level of education.	European Social Survey http://www.europeansocialsurvey.org/data/	No (only data for 2 nd and 5 th wave, 2004 + 2010)	Yes, across countries	25 European countries (2 nd wave), 27 mostly European countries (5 th wave)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A resp. 5+6). For the 2 nd round of ESS ISCED levels 5 and 6 were aggregated.		4-staged response scale ranging from "not at all true" to "very true"
	Satisfaction with balance between time on job and time on other aspects by highest level of education.	European Social Survey http://www.europeansocialsurvey.org/data/	No (only data for 5 th wave, 2010)	Yes, across countries	27 mostly European countries (5 th wave)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).		11-staged response scale ranging from "extremely dissatisfied" to "extremely satisfied"
Social prestige (associated with job)	Self-assessment of belonging to a social class by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above	A prestige scale might be better but captures aspect ok.	Item measured on 5-staged answer scale ranging from "upper class" to "lower class", also "no answer" and "don't know"
Student/graduate satisfaction with sustainable employment & related aspects in HE								

3.5 Indicators on sustainable employment, user group employers

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁵	Data quality & validity	Reason for choice	Comment
Employees able to flexibly adapt to changing tasks and challenges								
Creative employees								
Low turnover in staff								
Sufficient supply with highly educated employees	Labour force by sex, age and education (in 1,000)	International Labour Organization ILOSTAT Database (2016) http://www.ilo.org/ilostat/faces/help_home/data_by_subject?_adf.ctrl-state=ujhckfms7_1204&_afLoop=14015883796839	Yes	Yes, across countries	Data for 187 Member states worldwide, additional data for sub-national entities	Data source: Labour Force Survey, usually good quality of data, differentiation for various education levels possible (based on ISCED 97)	Assessment of sufficiency of supply requires also estimate of number of employees needed. But no satisfactory alternative.	Assessment of sufficiency of supply requires also estimate of number of employees needed.
	Labour force participation rate by sex and education (in %)	International Labour Organization ILOSTAT Database (2016) http://www.ilo.org/ilostat/faces/help_home/data_by_subject?_adf.ctrl-state=ujhckfms7_1204&_afLoop=14015883796839	Yes	Yes, across countries	See above	See above		See above
	Unemployment ratio of people aged 20-34 by educational attainment level	EC/EACEA/Eurydice 2015, Figure 6.14, p. 183.	Yes	Yes	41 EHEA countries	Data from Eurostat LFS, good quality		
	Average annual growth rate of unemployment by educational attainment	EC/EACEA/Eurydice 2015, Figure 6.15, p. 184.	No	Yes	41 EHEA countries	Data from Eurostat LFS, good quality		
	Unemployment ratio of tertiary education graduates aged 20-34, by the numbers of years since graduation	EC/EACEA/Eurydice 2015, p. 188.	Yes	Yes	34 EHEA countries	EU-LFS data is of very good quality; it is noted that samples are small for most medium and small countries; the indicator gives an		

⁵ In case of periodical data, the geographical coverage refers to the most current data. In case the indicator comprises several sub-indicators, the geographical coverage may vary as data for certain sub-indicators may not be available for all countries.

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁵	Data quality & validity	Reason for choice	Comment
						understanding of successful transition but it is not clear whether graduates have been employed in the meantime; as results are not compared to overall levels unemployment the interpretation is hard; no differentiated measurement of HE.		
	Total job openings (expansion and replacement demands) (in 1,000) by sector and qualification level 2010-2020, EU-27+	CEDEFOP 2012, Table 7, p. 85.	unknown	Yes	29 European countries (EU-27 plus Norway, Switzerland), only aggregate data, no differentiation by country	Prognosis for 2010-2020, differentiation by 3 qualification levels (low, medium, high) based on ISCED 1997		Data sources: Eurostat database, OECD STAN database
	Replacement demand by country and qualification (in 1,000), total additional labour demand includes number of changes and replacement needs	CEDEFOP 2012, Table 20, p. 94.	unknown	Yes	29 European countries (EU-27 plus Norway, Switzerland)	Data for 2010 and prognosis for 2010-2020, differentiation by 3 qualification levels (low, medium, high) based on ISCED 1997		Data sources: Eurostat database, OECD STAN database
Diversity of and good mix of qualifications, skills, competencies needed	Distribution of graduates at education level and programme orientation by sex and field of education	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	34 OECD countries, including 32 European countries and 26 countries of EU28	Eurostat data is of good quality; the indicator measures the attribute well; differentiation by three levels of tertiary education is made (ISCED 2011)		
	Graduates in tertiary education, in science, math., computing, engineering, manufacturing, construction, by sex - per 1000 of population aged 20-29	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	33 European countries, including EU28	Eurostat data is of good quality; the indicator measures the attribute well		
	Graduates at doctoral level by sex and age groups - per 1000 of population aged 25-34	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	31 European countries, including 26 countries of EU28	Eurostat data is of good quality; the indicator measures the attribute well		
	Graduates at doctoral level, in science, math., computing, engineering, manufacturing, construction, by sex - per 1000 of population aged 25-34	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes, across countries	33 European countries, including EU28	Eurostat data is of good quality; the indicator measures the attribute well		

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁵	Data quality & validity	Reason for choice	Comment
	Percentage of adults who have attained tertiary education by type of programme and age group	OECD 2015a, Table A1.3a, p. 41.	Yes	Yes, across countries	34 OECD countries and 10 partner countries	UOE data is of good quality; indicator measures the attribute well, data based on ISCED 2011, 4 levels of tertiary education distinguished.		
Employers' satisfaction with skills & competences	Employers' satisfaction with graduate skills ("HE-graduates recruited in the last 3-5 years have the skills required to work in respondents' companies")	European Commission 2010, p. 7.	No	Yes, across countries	31 European countries	7,036 companies across 31 countries were interviewed, telephone interviews with chief human resource officers and CEOs, 76% medium sized companies, 24% large companies		4 response categories ranging from "strongly agree" to "strongly disagree"
	Satisfaction with higher education graduate recruits in terms of their various skills and capabilities	European Commission 2010, p. 7.	No	Yes, across countries	31 European countries	7,036 companies across 31 countries were interviewed, telephone interviews with chief human resource officers and CEOs, 76% medium sized companies, 24% large companies		rating of 11 skills and capabilities (e.g. computer skills, sector-specific skills, or team-working skills); 4 response categories ranging from "very satisfied" to "not satisfied at all"
Employees' productivity	Tertiary level of educational attainment and labour productivity	ILO Key indicators of Labour Market, 9 th edition, Figure 3.3, p. 14.	Unknown	Yes, across countries	74 countries	Data from KILM database		Labour productivity per person employed (1,000 US\$) is compared to share of labour force with tertiary level of education (%) (regression analysis)

3.6 Indicators on sustainable employment, user group society

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁶	Data quality & validity	Reason for choice	Comment
Economic productivity	Tertiary level of educational attainment and labour productivity.	ILO Key indicators of Labour Market, 9 th edition, Figure 3.3, p. 14.	Unknown	Yes, across countries	74 countries	Data from KILM database		Labour productivity per person employed (1,000 US\$) is compared to share of labour force with tertiary level of education (%) (regression analysis)
Level of employment/unemployment	Employment by educational attainment level - annual data (%age of total employment)	European Commission, Eurostat 2016, EU-LFS, http://ec.europa.eu/eurostat/data/database	Yes	Yes	34 European countries and various Euro area and European Union aggregates	Eurostat data is of good quality, differentiation for various education levels possible (based on ISCED 2011)		
	Employment rates by sex, age and educational attainment level (% of respective educational level)	European Commission, Eurostat 2016, EU-LFS, http://ec.europa.eu/eurostat/data/database	Yes	Yes	33 European countries and various Euro area and European Union aggregates	Eurostat data is of good quality, differentiation for various education levels possible (based on ISCED 2011)	rates are more telling than absolute numbers; indicator shows degree of employment by edu. Att.	
	Employment by sex, age and educational attainment level (in 1 000)	European Commission, Eurostat 2016, EU-LFS, http://ec.europa.eu/eurostat/data/database	Yes	Yes	33 European countries and various Euro area and European Union aggregates	Eurostat data is of good quality, differentiation for various education levels possible (based on ISCED 2011)		
	Employment by sex, occupation and educational attainment level (in 1 000)	European Commission, Eurostat 2016, EU-LFS, http://ec.europa.eu/eurostat/data/database	Yes	Yes	33 European countries and various Euro area and European Union aggregates	Eurostat data is of good quality, differentiation for various education levels possible (based on ISCED 2011)		Occupations surveyed: Managers, professionals, technicians and associate professionals,

⁶ In case of periodical data, the geographical coverage refers to the most current data. In case the indicator comprises several sub-indicators, the geographical coverage may vary as data for certain sub-indicators may not be available for all countries.

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁶	Data quality & validity	Reason for choice	Comment
								clerical support workers
	Employment rate of recent graduates by level of education (in %)	European Commission 2015, Table A.2., p. 84. http://ec.europa.eu/education/tools/et-monitor_en.htm	Unknown (data for 2008 and 2014)	Yes	EU-28 countries	Source: Eurostat-LFS, data is of good quality, differentiation by two education groups: ISCED 3-4 and 5-8 (based on ISCED 2011)		
	Unemployment by sex and educational attainment level - annual average (in thousand persons)	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes	29 European countries and various Euro area and European Union aggregates	Eurostat data is of good quality, focus groups only: underemployed part-time workers, persons seeking work but not immediately available, differentiation for various education levels possible (based on ISCED 2011)		Differentiation by age groups possible (15-74 and 20-74 years)
	Unemployment ratio of people aged 20-34 by educational attainment level	EC/EACEA/Eurydice 2015, Figure 6.14, p. 183.	Yes	Yes	41 EHEA countries	Data from Eurostat LFS, good quality		
Impact of HE on public revenues	Public costs & benefits of men & women attaining tertiary education	OECD 2015a, Table A7.4a, p. 149, Table A7.4b, p. 150.	Yes	Yes	Both tables: 25 OECD countries	Data is of good quality; indicator measures the attribute well; a connection to HE is made.		
Impact of HE on social security system	Public costs & benefits of men & women attaining tertiary education	OECD 2015a, Table A7.4a, p. 149, Table A7.4b, p. 150.	Yes	Yes	Both tables: 25 OECD countries	Data is of good quality; indicator measures the attribute well; a connection to HE is made.		
Impact of sustainable employment on families, friends, associations, neighbourhoods								
Highly educated workforce	Population by educational attainment level, sex and age (%)	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes	33 European countries and various Euro area and European Union aggregates	Eurostat data is of good quality, differentiation for various education levels possible (based on ISCED 2011)		
	Labour force with tertiary education (% of total)	World Bank 2016, World Development Indicators, http://databank.worldbank.org/data/reports.aspx?source=2&Topic=4	Yes	Yes	39 countries worldwide	data is of good quality, original source: ILO	Labour force more adequate than total pop.	
Innovation capacity of economy	Total R&D personnel and researchers by sectors of performance, as % of total labour force and	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes	35 European countries, EU28, EU15, and Euro area aggregates	Eurostat data is of good quality, differentiation for educational levels possible (ISCED 2011) but		

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁶	Data quality & validity	Reason for choice	Comment
	total employment, and by sex					differentiated information not available for all countries		
	Innovation activities and expenditures in 2012 in the enterprises by NACE Rev. 2 activity and size class	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes	30 European countries, including most EU28 countries	Eurostat data based on the community innovation survey; Eurostat data usually is of good quality		
	Patent applications to the European Patent Office (EPO) by priority year; patents granted by the United States Patents and Trademark Office (USPTO) by priority year	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes	Yes	A large bandwidth of countries, including most OECD countries and EU28	Eurostat data usually is of good quality		
Knowledge-based economy	Proportion of R&D-intensive industries and knowledge-intensive services in total creation of value	Expertenkommission Forschung und Innovation 2016, p. 127	Yes	Yes	8 OECD countries shown in publication; more countries should be available	The data is provided by national statistical offices, Eurostat, and OECD and is expected to be of good quality. The report is published by a high-level commission mandated by the German federal government.		
Impact of HE on growth	Correlation between output per employee hour and tertiary employment share (1982-2005)	Holland et al., 2013, p. 36.	Unknown (probably not)	Limited (Skill levels applied by EU KLEMS are not based on an international classification. Comparability across countries cannot be assured.)	15 countries (mostly European)	Data source: NIGEM database (National Institute Global Econometric Model, UK) and EU KLEMS database. Indicators as such appear useful for measuring the attribute.		Differentiation by 3 skill levels: low, medium, higher
	Contributions of higher, medium and low skills growth to output growth, in % (1982-2005)	Holland et al., 2013, p. 46.	Unknown (probably not)	See above	See above	See above	seems to grasp the aspect best	See above
	Output per person hour by skills accumulation, in	Holland et al., 2013, p. 47.	Unknown	See above	See above	See above		See above

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁶	Data quality & validity	Reason for choice	Comment
	%-age points (1982-2005)		(probably not)					
	Impact of student test scores on economic growth	Hanushek & Wößmann, 2007, p. 31-38.	No	Yes, across countries	50 countries worldwide	Data on international student achievement tests 1964-2003 and GDP per capita are used in economic growth regression model.		The study focuses on the contribution of educational quality on economic growth.
	Effect of increase in additional years in higher education on increase in economic growth	Barro & Sala-i-Martin, 2004, p. 536.	Irregularly	No, cross-sectional study, no comparison between countries possible	Up to 83 countries included (period 1985-95)	Data sources: Penn-World Tables, World Bank, in particular cases national statistics		
External effects of skills and competencies on families, friends, associations, neighbourhoods	HE-graduates' feeling of having been able to positively change home community	Martel & Bhandari, 2016, p. 14. http://www.iie.org/Who-We-Are/News-and-Events/Press-Center/Press-Releases/2016/2016-04-26-IFP-Tracking-Study-1	Not yet (first impact study of an International Fellowships Program)	Difficult to judge (not much information on study methodology available)	22 countries covering Africa, Middle East, Asia, Russia, Latin America	Alumni survey based on 1,861 cases from 22 countries world-wide (43% of Programme population), ten-year longitudinal study.		Reported means of sharing knowledge with home community: cultural/social gatherings, conferences/meetings, local government meetings, news articles, blog/social media, TV/radio
	Local organizational improvements through HE-graduates	Martel & Bhandari, 2016, p. 15. http://www.iie.org/Who-We-Are/News-and-Events/Press-Center/Press-Releases/2016/2016-04-26-IFP-Tracking-Study-1	See above	See above	See above	See above. Quantifying by counting the number of employees affected (27,524 employees affected in home communities).		Improvements made within local organizations: Items: network/partnership building, task management, efficient use of resources, vision & mission, employee productivity
	Provision of community benefits through HE-graduates	Martel & Bhandari, 2016, p. 16. http://www.iie.org/Who-We-Are/News-and-Events/Press-Center/Press-	See above	See above	See above	See above. Quantifying by giving percentages of respondents claiming to have contributed to various public interests.	Seems to be the best summary indicator; disad.: not for	Items of community benefits: awareness of social and cultural diversity issues, social

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁶	Data quality & validity	Reason for choice	Comment
		Releases/2016/2016-04-26-IFP-Tracking-Study-1					developed countries	opportunities, economic opportunities, educational opportunities
	Provision of community benefits through new organisations & programmes founded by HE-graduates	Martel & Bhandari, 2016, p. 18. http://www.iie.org/Who-We-Are/News-and-Events/Press-Center/Press-Releases/2016/2016-04-26-IFP-Tracking-Study-1	See above	See above	See above	See above. Respondents estimate that new organisations and programmes have impacted approx. 9.5 million adults/children in home countries and 860,000 individuals in other countries.		Item of community benefits: social justice benefits

3.7 Indicators on active citizenship

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁷	Data quality & validity	Reason for choice	Comment
Democratic values	Appreciation of democracy by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above	captures democratic values better than the ESS items that rather capture perception of pol. Sys. Which is interesting as well though.	Items: e.g. Importance of parliament, elections and government for governing the country, Assessment of having a democratic political system, Importance of Democracy
	Essentials of democracy by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Items: e.g. taxation and payment of subsidies, free elections, state aid for unemployment, protection against state oppression, equal rights for the sexes
	Confidence in various institutions by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Items: e.g. government, political parties, parliament, churches, (law) courts
	Trust in various institutions by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).		Item measured on 11-staged-scale ranging from “no trust at all” to “complete trust”. Items: country’s parliament, legal system, police, politicians, political parties, European Parliament, United Nations

⁷ In case of periodical data, the geographical coverage refers to the most current data. In case the indicator comprises several sub-indicators, the geographical coverage may vary as data for certain sub-indicators may not be available for all countries.

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁷	Data quality & validity	Reason for choice	Comment
	Satisfaction with the way democracy works in respondent's country	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).		Item measured on 11-staged-scale ranging from "extremely dissatisfied" to "extremely satisfied".
	Confidence in fairness of political elections by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Items: e.g. fair counting of votes, bribery of voters, fairness of election officials, rich people buying elections, threatening of voters at polls
Tolerance, intercultural skills & values	Tolerance regarding various population groups by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above	captures aspect well	Population groups: e.g. different races, immigrants, heavy drinkers, people having AIDS, drug addicts
	Religious tolerance by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above	captures aspect well	Items: e.g. relationship of religion and science, acceptance of other religions, morality of people belonging to other religions
	Attitudes towards gender equality by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Items: e.g. fitness for political leadership, importance of university education, acceptance of unequal pay, fitness for managing business
	Attitudes towards immigration of different groups to respondent's country	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous		groups: same ethnic group or race, different ethnic group or

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁷	Data quality & validity	Reason for choice	Comment
						translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).		race, from poorer countries in Europe, from poorer countries outside Europe; 4-point scale from "allow many to come and live here" to "allow none"
	Attitudes towards the consequences of immigration for respondent's country	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).		consequences: bad or good for economy, undermine or enrich cultural life, a worse or a better place to live; assessment on 11-point scale
Political literacy, civic skills & (sense of) ability to have influence	Likelihood of reporting to believe that they have a say in government by educational attainment	OECD 2015a, table A8.4, p. 164.	Yes expectably	Yes, across countries	18 OECD countries and 4 sub-national entities	PIAAC data is of good quality; indicator measures the attribute well; a connection to HE is made.		Expectedly, PIAAC will only be repeated at long intervals, e.g. every 10 years
	Assessments of political system allowing people to have a say in what government does/to influence politics by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).	can be expected to be done more frequently than PIAAC	Item measured on 11-staged scale ranging from "not at all" to "completely"
	Belief that politicians care what people think	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).	can be expected to be done more frequently than PIAAC	Item measured on 11-staged scale ranging from "not at all" to "completely"

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁷	Data quality & validity	Reason for choice	Comment
	Confidence in own ability to participate in politics by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 European and non-European countries (7 th round)	See above	can be expected to be done more frequently than PIAAC	Item measured on 11-staged scale ranging from “not at all confident” to “completely confident”
	Ability to take active role in political group by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 European and non-European countries (7 th round)	See above	can be expected to be done more frequently than PIAAC	Item measured on 11-staged scale ranging from “not at all able” to “completely able”
	Assessment of how easy respondent finds it to personally to take part in politics by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 European and non-European countries (7 th round)	See above	can be expected to be done more frequently than PIAAC	Item measured on 11-staged scale ranging from “not at all easy” to “extremely easy”
Social participation & inclusion (e.g. participation in associations, unions or societal & community projects, volunteering)	Participation in associations, unions, political parties, etc., by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Membership in organisations: e.g. churches, labour unions, political parties, environmental organisations, charitable organisations
	Likelihood of reporting to volunteer at least once a month by educational attainment	OECD 2015a, Table 8.2., p. 162.	Yes expectably	Yes, across countries	19 OECD countries and 4 sub-national entities	PIAAC data is of good quality; indicator measures the attribute well; a connection to HE is made.	more general than ESS items	Expectedly, PIAAC will only be repeated at long intervals, e.g. every 10 years
	Having worked voluntarily for humanitarian organizations etc. during the last 12 months by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	No (data only available for 1 st round 2002)	Yes, across countries	20 mostly European countries (1 st round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by 5 groups of ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5+6). For the 1 st round of ESS ISCED levels 5 and 6 were aggregated.		Response categories: marked, not marked

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁷	Data quality & validity	Reason for choice	Comment
	Having worked voluntarily for environment/peace/animal organizations during the last 12 months by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	No (data only available for 1 st round 2002)	Yes, across countries	20 mostly European countries (1 st round)	See above		Response categories: marked, not marked
	Having worked voluntarily for sports/outdoor activity club during the last 12 months by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	No (data only available for 1 st round 2002)	Yes, across countries	20 mostly European countries (1 st round)	See above		Response categories: marked, not marked
	Having worked in another organization or association during last 12 months by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	See above	more European countries than WVS; could be merged with above	Response categories: yes, no
Political participation (e.g. campaigning, protesting, voting, running for political functions)	Participation in various political actions by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Political actions: e.g. signing a petition, joining in boycotts, attending peaceful demonstration, joining strikes, other acts of protest
	Participation in various political actions in the last 12 months by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).	captures aspect well	Response categories: Yes, no. Items: contacted politician/government official, worked in political party or action group, worked in another organization or association, worn/displayed campaign badge/stickers, signed petitions, taken part in lawful public demonstrations, boycotted certain products

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁷	Data quality & validity	Reason for choice	Comment
	Internet activities of individuals by level of formal education	European Commission, Eurostat 2016, http://ec.europa.eu/eurostat/data/database	Yes (but available data only for 2013 and 2015)	Yes, across countries	30 European countries	Eurostat data is of good quality; the indicator measures the attribute well; differentiation by three levels of formal education is made, however, level of formal education is not explicitly defined		Internet activities: posting opinions on civic or political issues via websites (e.g. blogs, social networks, etc.)
	Frequency of voting in elections by highest educational attainment	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Types of elections: local and national level
Lower risk of becoming criminal and/or becoming a victim of crime, less crime	Justifiability of criminal/illegal activities by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above	captures aspect well	Items: e.g. acceptance of bribe, stealing property, violence against others, a man beating his wife
	Overall security in neighborhood by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		
	Frequency of security-relevant activities occurring in neighborhood by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Types of activities: e.g. robberies, racist behavior, drug sale in streets, police/military interfere with people's private life
	Respondent or household member became victim of burglary/assault in last 5 years by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	The survey involves strict random probability sampling, a minimum target response rate of 70% and rigorous translation protocols. Differentiation by all ISCED levels (based on ISCED 1997). Number of cases in columns may occasionally fall below 30 (does not hold for sum of ISCED 5A).		Response categories: Yes, no
	Feeling of safety of walking alone in local area after dark by highest level of education	European Social Survey http://www.europeansocialsurvey.org/data/	Yes	Yes, across countries	21 mostly European countries (7 th round)	See above		4-staged answer scale ranging from "very safe" to "very unsafe"

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁷	Data quality & validity	Reason for choice	Comment
Student/graduate satisfaction with active citizenship & related aspects in HE								
Social dimension of HE	Representation of students from high, medium and low educational backgrounds	EUROSTUDENT 2015, Figure 3.3, p. 54	Yes	Yes, across countries	23 European countries, including 20 EU28 countries	EUROSTUDENT data is based on coordinated student surveys of good quality	social origin is the typical dimension, regular, comparable	
	Gender balance in HE: percentage of women in new entrants in tertiary education	EC/EACEA/Eurydice 2015, Figure 4.1, p. 107.	Yes	Yes, across countries	36 EHEA countries	Data from Eurostat, and UOE, good quality of data		
	Odds ratio of native-born over foreign-born population to complete tertiary education	EC/EACEA/Eurydice 2015, Figure 4.6, p. 114.	Yes, for the reports 2012 and 2015	Yes, across countries	31 EHEA countries	Data from Eurostat, EU-LFS, good quality of data		
	Odds ratio of young adults with highly educated parents over young adults with medium educated parents to complete tertiary education	EC/EACEA/Eurydice 2015, Figure 4.7, p. 115.	Principally yes (only the report of 2009 does not use odds ratio, but %ages of individuals having completed HE)	Yes, across countries	31 EHEA countries	Data from Eurostat, EU-SILC ad hoc module on intergenerational transmission of disadvantages, good quality of data		
	Inequality index in access to tertiary education	Koucký et al. 2010, p. 26.	No	Yes, across countries	25 European countries	Analysis uses data from European Social Survey for the first 4 rounds		Results based on logistic regression model. Explaining variables: mother's/father's highest level of education and occupation
Employee participation	Membership in labour union by highest educational attainment level	World Values Survey 2016, http://www.worldvaluessurvey.org/WVSONline.jsp	Yes	Yes, across countries	See above	See above		Membership status: Active/inactive/non-member of labour union

Aspects	Indicator	Source	Periodical	Comparable	Geographical coverage ⁷	Data quality & validity	Reason for choice	Comment
Corporate Social Responsibility								
External effects of democratic values, civic skills etc. on families, friends, associations, neighbourhoods								

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