Council of the European Union

Brussels, 1 June 2017
(OR. en)

9843/17
ADD 1

EDUC 277
JEUN 80
EMPL 347
SOC 450
COMPET 462
RECH 217

COVER NOTE

From:	Secretary-General of the European Commission, signed by Mr Jordi AYET PUIGARNAU, Director
date of receipt:	31 May 2017
To:	Mr Jeppe TRANHOLM-MIKKELSEN, Secretary-General of the Council of the European Union
No. Cion doc.:	SWD(2017) 164 final
Subject:	COMMISSION STAFF WORKING DOCUMENT Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions A renewed EU agenda for higher education

Delegations will find attached document SWD(2017) 164 final.

———————————

Encl.: SWD(2017) 164 final

Brussels, 30.5.2017
SWD(2017) 164 final

COMMISSION STAFF WORKING DOCUMENT
Accompanying the document

Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions

A renewed EU agenda for higher education

{COM(2017) 247 final}

EN   **EN**

CONTENTS

1.   INTRODUCTION

1.   This Staff Working Document provides analysis and evidence to complement and underpin the four key priorities set out in the Commission's Communication on A renewed EU agenda for Higher Education.

2.   The analysis in this document complements evidence already presented in the Staff Working Document accompanying the New Skills Agenda for Europe[1], adopted in June 2016, which provides relevant analysis on the following issues:

- A broad overview of **skills demand and mismatch** in the EU;

- An overview of existing **EU support for skills development** and;

- A detailed analysis of the **results of the public consultation** on the review of the EU's modernisation of higher education[2].

3.   After providing a review of the main channels through which higher education systems in Europe contribute to economic and social development, this document analyses four key challenges identified in the accompanying Communication. For each of the challenges, the analysis highlights available evidence of internal or external factors that are affecting, or are likely to affect, the performance of higher education systems in the area concerned, before examining examples of promising approaches to tackling these issues.

---

[1]   http://ec.europa.eu/social/main.jsp?catId=1223&langId=en&moreDocuments=yes
[2]   European Commission (2016a)

2 WHY HIGHER EDUCATION MATTERS TO EUROPE

2.1 Higher education: a strong contribution to Europe's development

4.   Higher education has a unique role to play in building successful, inclusive societies. Through their educational activities, higher education institutions (HEIs) equip students with advanced knowledge, skills and competences, contributing to society's stock of human capital and promoting social mobility and inclusion. Through research and development activities, individual academics, research teams and institutions create new knowledge, develop solutions to societal challenges and lay the foundations for the innovations of the future. And through cooperation with business, the public sector and civil society, universities and colleges strengthen the economic, social and cultural fabric of the localities and regions where they are located and drive innovation in many types of setting.

5.   From a human capital perspective, effective higher education systems need to respond to demand for highly skilled people in developed economies that is increasing and changing. The growth of the service sector and relative decline of mass manufacturing has increased the number of knowledge-intensive jobs in the economy. At the same time, with greater automation and digitalisation, the tasks associated with specific occupations are frequently becoming more complex[3].

6.   Largely as a result of these trends, CEDEFOP predicts that half of all job opportunities[4] that will become available in the EU in the period up to 2025 – as a result of new job creation and to replace those leaving the labour market - will require high-level qualifications[5]. CEDEFOP estimates an additional 16.3 million jobs will be created in the EU for tertiary graduates in the period up to 2025, while employment is predicted to fall significantly in jobs assumed to require low qualifications and slightly in jobs requiring medium qualifications.

Figure 2.1: Job opportunities by level of qualification: change between 2013 and 2025 (EU 28)

---

[3]   Arntz, M., T. Gregory and U. Zierahn (2016)
[4]   The indicator 'job opportunities' is the sum of net change in total employment (expansion demand) and an estimation of replacement demand resulting from people leaving work places for different reasons.
[5]   High-level qualifications are defined as tertiary qualifications from ISCED 5 to 8 (short-cycle degrees to doctorate). See CEDEFOP (2016a)
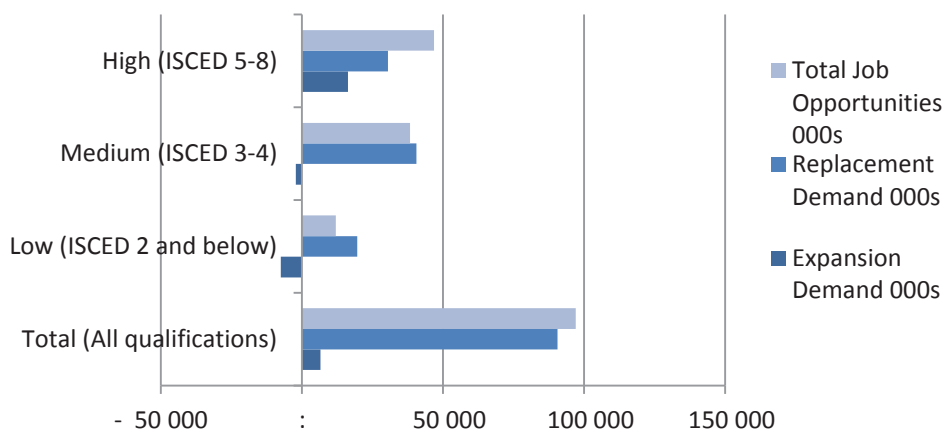
Source: CEDEFOP Skills Forecasts 2016a

7.   Shifts in the structure of European economies and the nature of specific job profiles and occupations are going hand in hand with an increase in part-time, temporary work and self-employment – at the expense of 'traditional' permanent, full-time employment[6]. This trend also has implications for the skills needs. As jobs become more flexible in form, as well as complex in terms of content, a higher proportion of the population needs a broader set of high-level skills to allow them to adapt to, and operate effectively in, the new reality of work. Open and flexible learning is one of the various ways in which higher education institutions can support the workforce to upskill and reskill, in a cost-effective and flexible way, in order to meet the requirements of an ever-changing job market[7].

8.   Capacities to process large amounts of information, make critical judgements, communicate and cooperate effectively, think entrepreneurially and adapt rapidly to changing contexts are more important than ever. A highly skilled population is important not just to allow Europe to react to a changing environment, but also to shape and seize the opportunities of a modern, knowledge-based economy. The same competencies are equally relevant for engaged participation in civil society.

9.   Alongside their role in education, Higher Education Institutions concentrate almost a quarter of the EU's total public and private spending on research and development[8]. The results of frontier and applied research contribute to the stock of human knowledge and provide pointers for solving major economic, social and environmental problems.

Figure 2.2: Research spending in higher education as a proportion of total intramural R&D spending (2015)

---

[6]   OECD (2016a)

[7]   Joint Research Centre (2015)

[8]   Total intramural R&D expenditure in Higher Education (HERD) was EUR 69.4 billion in 2015
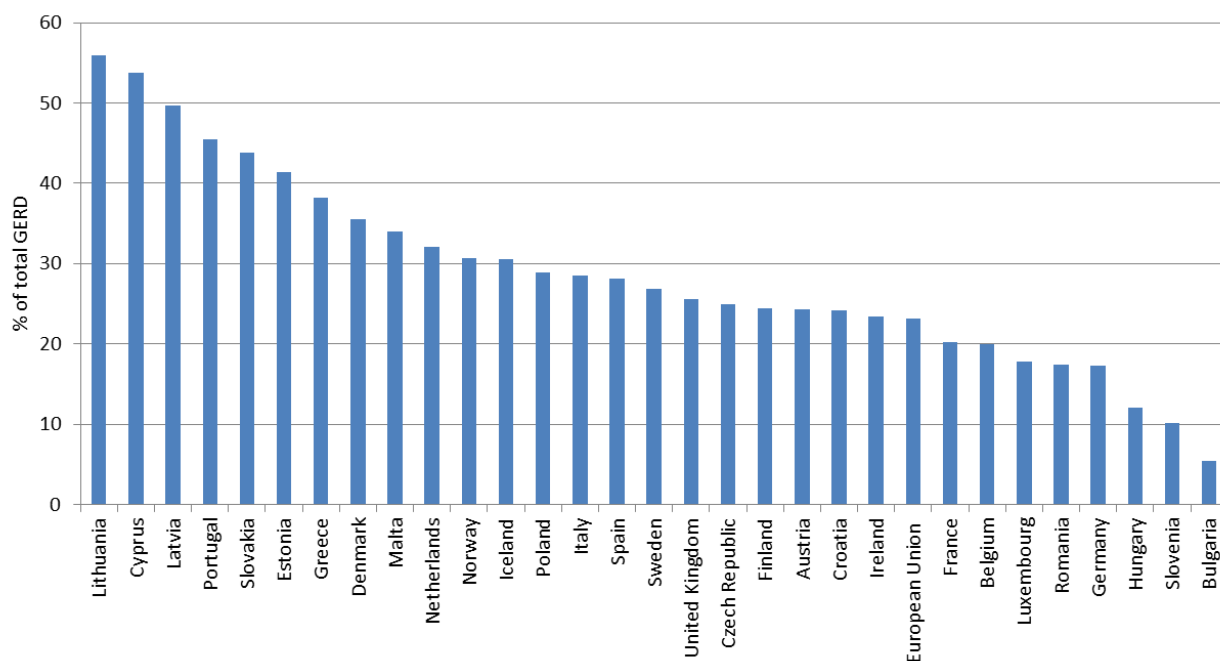
Source: Eurostat (rd_e_gerdtot)

10.   As knowledge institutions, HEIs are increasingly embedded in broader innovation eco-systems at national and regional level. Contributing to innovation and economic development has become a goal of universities and colleges across Europe. Commercial spin-off companies, technology transfer activities and networks of cooperation with businesses, government and public services have become widespread.

11.   However, the mechanisms through which such activities contribute to the product, service and organisational innovation that boost productivity within the wider economy are – like innovation as a whole - complex and unpredictable. There is a broad consensus that innovation does not result from a linear 'pipeline' leading from research and development to the marketable products and services, but rather from a dynamic system of interactions and feedback loops linking different actors in particular contexts. This makes 'innovation' virtually impossible to plan. Instead, policy makers and practitioners – including those in higher education – are increasingly focusing on creating favourable conditions for entrepreneurial thinking, networking, creativity and risk-taking. As a recent paper by the European Political Strategy Centre put it: *'our innovation economy is not a Roman aqueduct, but a muddy pond ... Innovation requires of all actors, corporate, academic, civic and political, the instinct of the hunter-gatherer, not the farmer'*[9].

12.   While the contribution of higher education to innovation in the wider economy has long been, and remains, a core part of higher education's 'third mission', higher education institutions are increasingly giving more emphasis to their wider social responsibility to the communities in which they are located. The notion of the 'civic university' is sometimes

---

[9]   European Political Strategy Centre - EPSC (2016)

used[10] to characterise institutional strategies that aim to promote mutually beneficial engagement between the community, region and the university.

13.   Higher education institutions, government, business and civil society are the four sets of actors in the 'Quadruple Helix'[11]. This is an emerging model of cooperation for higher education institutions, with a strong emphasis on broad patterns of cooperation in which different sets of actors 'co-produce' new ideas, solutions to problems. In comparison to more established models of innovation and cooperation, the Quadruple Helix, focuses to a greater extent on the involvement of citizens and communities and on promoting positive change in a wider range of settings (social innovation, environmental improvements, community cohesion, as well as the development of new products, services and processes in enterprises).

14.   Alongside the wide-ranging – and far-reaching - impacts of higher education on skills development, knowledge creation, innovation and social cohesion, higher education institutions have a range of even more direct effects on the localities and regions where they are located. Recent work in a number of EU countries has also focused on measuring the direct economic impact of higher education[12]. A study commissioned by the League of European Research Universities (LERU) in 2015[13] estimated that the 21 LERU universities contributed more than €55 billion Gross Value Added (GVA) to the European economy and supported around 900,000 jobs[14]. When the earnings premium associated with one year's cohort of graduates was included in the calculation the contribution of the 21 universities increased to €71.2 billion GVA. The authors argue that extrapolating this impact across the whole research universities sector (thus not including other parts of the higher education sector) across Europe suggests that the sector contributes over €300 billion GVA per annum and supports 3.8 million jobs across Europe. This is equivalent to 2.2% of the total GVA of the European economy and 1.8% of all European jobs.

2.2   Successes and challenges

15.   The expansion of higher education in recent years is one of Europe's success stories. Progress in relation to the EU's Europe 2020 headline target that 40% of those aged 30 to 34 should have a tertiary qualification or equivalent by 2020[15] has been significant. Just over 39% of 30-34 year olds had a tertiary education qualification in 2015, compared to 28% ten years earlier. This indicator takes into account all types of tertiary education qualification, from two-year short cycle courses to doctoral qualifications[16]. As shown in Figure 2.3, tertiary attainment rates among young people vary considerably across the EU, from just over a 25% in Italy and Romania to over 50% in Lithuania, Cyprus, Luxembourg, Ireland and Sweden.

---

10   Goddard, J (2011)
11   As opposed to the long-established 'triple helix' of government, academia and business. See Cavallini, S., R. Soldi, J. Friedl, M. Volpe (2016)
12   For example in France (Campus Responsables (2016)) and the UK (Universities UK (2015b)
13   BiGGAR Economics (2015)
14   Through direct employment and expenditure in a location; student spending and employment; activities including technology licensing, consultancy, contract and collaborative research, spin-outs, and start-ups, research and science parks, workforce training and staff volunteering; and earnings premiums for graduates.
15   https://ec.europa.eu/info/strategy/european-semester/framework/europe-2020-strategy_en
16   ISCED levels 5 to 8

Figure 2.3: Tertiary education attainment among 30-34 year olds by type of qualification (2016)
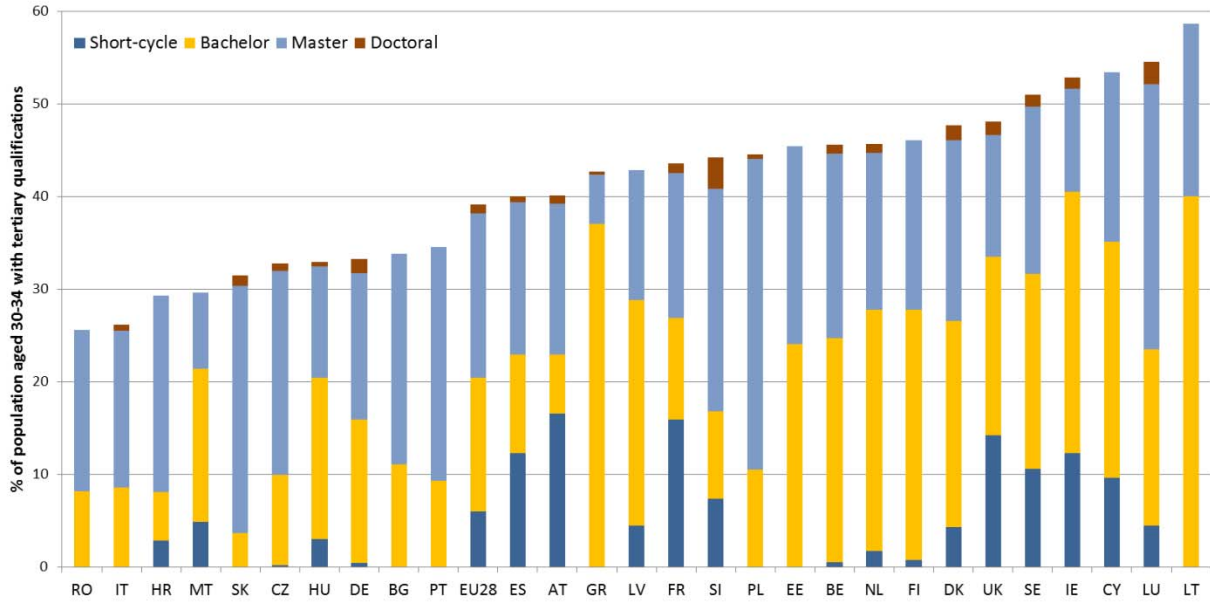
Source: Eurostat (EU-LFS, special extraction, 2016). Note: The indicator covers the share of the population aged 30-34 years having successfully completed tertiary education (ISCED 5-8), broken down by type of degree. Country notes: Small, and therefore unreliable, sample sizes for short-cycle attainment have been included in bachelor attainment for CZ, EE, IT, PL, RO, SK. Small, and therefore unreliable, sample sizes for doctoral attainment have been included in master attainment for BG, EE, LT, PT, RO, FI.

16.   Despite the considerable increase in the number of people with a tertiary qualification flowing into the EU workforce, at aggregate level, tertiary graduates are still more successful than their peers with lower levels of qualification at securing and maintaining employment. The average employment rate of recent, young tertiary graduates[17] in the EU in 2016 was 82.8%, compared with 72.6% for those of the same age who had recently completed upper secondary or post-secondary, non-tertiary qualifications (i.e. those with at most a high-school or further education diploma). The equivalent figures for 2008, before the full impact of the financial crisis was felt, were 87% for tertiary graduates and 77% for upper secondary and post-secondary, non-tertiary leavers.

Figure 2.4: Employment rates of recent graduates (2016)

Source: Eurostat: Employment rates of young people aged 20-34 not in education and training 1-3 years since completion of highest level of education [edat_lfse_24]

17.   While the headline employment rate of young tertiary graduates in most Member States has been comparatively robust in the wake of the crisis and is beginning to increase again, the underlying picture is more nuanced. In particular, an increasing number of young tertiary graduates are working in jobs which do not fully use their qualifications and skills. The recent European Skills and Jobs Survey found that, in 2014, up to 25% of young employed tertiary graduates (aged 24 to 35) considered themselves to be overqualified for their jobs[18]. This finding in part reflects individual choices by graduates to take lower skilled jobs, but also highlights the difficulties some sections of the graduate population have had in moving into the labour market in a difficult and evolving economic environment.

18.   More generally, the results of the Commission's recent public consultation about the future of European cooperation in higher education[19], as well as evidence about the development of higher education from a range of sources, paint a mixed picture about the state of the sector in Europe. Despite globally and widely accepted positive impacts of higher education on graduates and society more broadly, four main areas of challenge emerge:

1. **A mismatch between the high-level skills Europe needs and the skills it has**: many parts of the EU are experiencing shortages in certain high-skill professions,, both in terms of qualifications and the quality of the associated skills. At the same time, too many graduates leave higher education with poor basic skills (literacy, numeracy, digital) and without the range of transversal skills (problem-solving, communication, etc.) they increasingly need for resilience in a changing world.

2. **Persistent and growing social divisions, which also affect higher education**: people from disadvantaged socio-economic and migrant groups remain far less likely to enter and complete higher education, while academics and graduates are too often

---

[18]   CEDEFOP (2015)
[19]   European Commission (2016)

7

perceived as detached from the rest of society and the communities where they are located.

3. **A gap between the potential contribution of higher education to innovation and the reality on the ground**: despite their expertise and capacities, higher education institutions are not contributing as much as they could to innovation in the wider economy (private and public sectors), particularly at local and regional level. The performance of higher education in research and research capacity varies strongly between EU regions.

4. **Higher Education systems that are often fragmented and governed in a piecemeal rather than holistic way**: funding, incentive and reward mechanisms in higher education are not configured to reward good teaching and research, encourage innovation, social inclusion and engagement in a balanced, effective and efficient way.

19. While each challenge has its own specific elements, they are clearly interconnected and have to be tackled as such. For example, social divisions and links between HEIs and their surrounding communities can be addressed with innovative solutions; the harnessing of innovation can require the upgrading of skills; and the role of HEIs in local and regional development is strongly affected by nationally designed higher education systems.

20. The following sections of this document review the evidence around each of these challenges and provide a synthesis of some of the most promising policies and practices being developed to address these challenges in Europe and elsewhere.

3 SKILLS MISMATCHES AND SKILLS DEVELOPMENT

3.1 High-level skills gaps in Europe

21. Assessing the extent to which higher education systems equip students with the knowledge, skills and competences they need is complex. In the schools sector, national examinations in many countries and international assessment exercises such as the OECD's Programme for International Student Assessment (PISA) exercise make it possible to compare certain aspects of students' skills levels and thus the extent to which schools are effective in helping them to acquire desired learning outcomes. No equivalent national or international skills assessment exercises currently exist at higher education level, even if projects are being developed to fill this gap in Europe and elsewhere[20]. As a result, our assessment of whether students are actually leaving systems with the right skills has to be based on a range of other indicators, including evidence from the labour market (employment trends and feedback from graduates and employers) and data from more general assessments of adult skills[21].

22. The evidence on how well higher education is currently performing in terms of equipping graduates with skills is mixed. One of the only comparative surveys of employers in the EU in recent times found that a large majority (89%) of employers who had recruited higher education graduates in the past five years agreed that these graduates *'had the skills required to work in their company'*, albeit with significant variation between Member States[22]. In contrast, in their responses to the online public consultation[23] undertaken in preparation for the new Commission Communication on higher education, 71% of students or recent graduates and 61% of higher education institution employees *disagreed* with the statement that "*there is a good match between the supply of higher education graduates and the knowledge and skills the economy needs*".

23. Underlying these kinds of general statements are two main concerns: shortages of tertiary graduates in specific fields of knowledge and a more general concern about the broad set of competencies all graduates need and whether or not higher education is helping them acquire these. A recent JRC CRELL[24] report analyses the evolution of skills over the lifetime of individuals and across generations for a number of EU countries, using data from PIAAC and its predecessor, IALS. The report finds that literacy skills decline with age after the end of formal education; in several countries, more recent birth cohorts exhibit lower levels of literacy than previous generations. This raises concerns about a possible decline in the effectiveness of education systems in providing younger generations with an adequate level of skills.

---

[20] These include the EU-funded CALOHEE project and the Measuring College Learning project in the US.
[21] Notably the OECD's Programme for the International Assessment of Adult Competencies (PIAAC)
[22] Eurobarometer (2010)
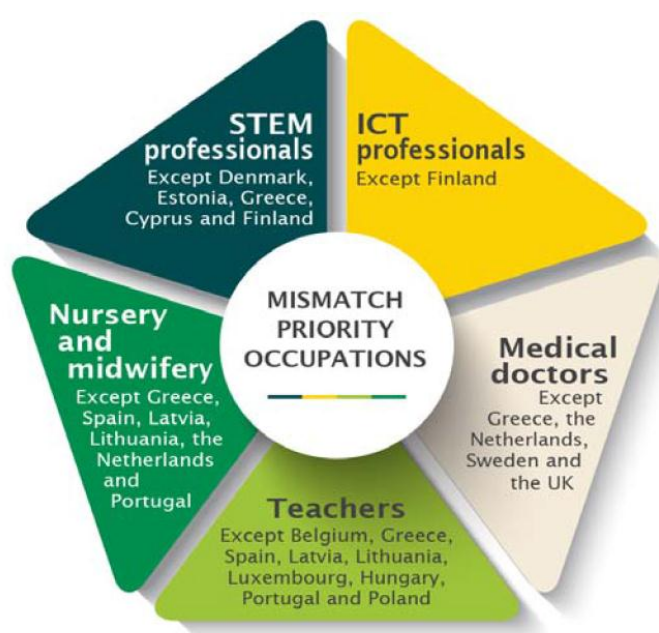[23] European Commission (2016a)
[24] Joint Research Centre (2015b)

Shortages in particular professional sectors…

24.   Based on analysis of quantitative and qualitative evidence from national labour markets, including skills need forecasts, CEDEFOP's Skills Panorama[25] has identified 'shortage occupations' in each EU Member State. Across the EU, the most frequently occurring shortages are in professional and associate professional occupations at high skills levels and for which a tertiary qualification is generally required. The top five are ICT professionals; medical doctors; 'science, technology, engineering and mathematics (STEM) professionals'[26]; nurses and midwives; and teachers (see Figure 3.1).

25.   For the areas of ICT and STEM, the analysis undertaken for the Skills Panorama finds that shortages are driven by a combination of growing demand, too few young people enrolling to study STEM (including ICT) subjects in higher education and a particular under-representation of women in these fields (see below). Moreover, in some countries and fields, there is evidence that STEM graduates go on to work in 'non-STEM' occupations, where they find better working conditions. The shortages in the medical professions are frequently linked to increased demand from an ageing

Figure 3.1: Top five 'shortage occupations' in EU 28

Source: CEDEFOP (2016b) Skills Panorama

society, restrictions on the numbers of study places and, in some countries, emigration of trained medical professionals. In teaching, the shortages are most often linked to an aging teaching workforce (meaning retirees need to be replaced) and, in some part of the EU, unattractive working conditions.

26.   The occupational fields where the largest shortages exist correspond to a large extent to fields of study where there are the largest gender imbalances in populations graduating. As shown in Figure 3.2, for the EU as a whole, over 70% of tertiary graduates in the broad field of 'engineering, manufacturing and construction' in 2014 were men. The proportion for 'information and communication technologies' was over 80%. In contrast, 74% of graduates in the fields of 'health and welfare' (including doctors and nurses) and 80% of graduates in education (including teachers) were women. The relative under-representation of one gender in these fields is an additional factor in the overall picture of supply and demand.

---

25   http://skillspanorama.cedefop.europa.eu/en
26   Classification used by CEDEFOP: this most commonly refers to branches of engineering

Figure 3.2: Distribution of tertiary graduates by field and sex, EU-28, 2014 (%)
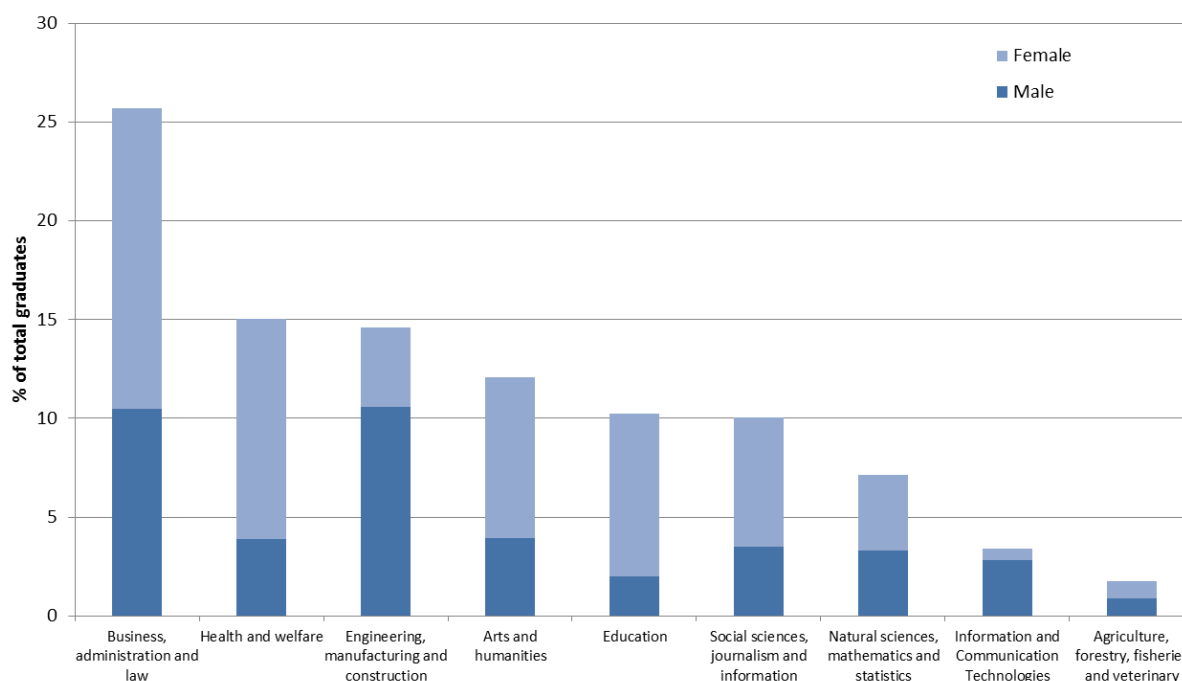
Source: Eurostat (educ_uoe_grad02) No data for NL. No data for IT for Engineering, manufacturing and construction and Natural sciences, mathematics and statistics

27.   Addressing these kinds of imbalances and shortages in high-level occupational skills is not, and cannot be, the sole responsibility of higher education systems. Other sectors of education and training, employers and government all have their role to play in helping to increase the flow of students into shortage study fields and creating attractive working environments for graduates. Higher education systems do need to play their part in ensuring adequate provision of places for education in shortages fields, developing programmes which develop a broad range of subject-specific and generic skills and helping to tackle the gender stereotypes associated with key shortage occupations.

…and growing demand for transversal skills.

28.   The increasing complexity of many high-skill jobs is one of the factors behind an increasing focus on the importance of generic, 'soft' or transversal skills in discussion of skills needs. Technological change has to date had most impact on routine tasks that are easily programmable and interactions that do not require person-to-person interaction. Person-to-person services and occupations relying more on creativity, context adaptability, task discretion, social skills and tacit cognitive capacities have been – and are likely to remain - less affected[27].

29.   Several surveys of employers point to increasing demand for these kinds of attributes. The 2014 European Skills and Jobs Survey[28], for example, highlighted the increased

---

[27]   Assessments of the likely impact of digitisation vary. Frey and Osborne (2013) estimated that 47% of US employment is subject to substitution (39% in Germany, 35% in the UK), whereas Arntz, Gregory and Zierahn (2016) put the figure at 12% (9% in Germany).

[28]   CEDEFOP (2015)

complexity of jobs, particularly at the top of the occupational scale, with 80% of managers and over 70% of professionals and associate professionals reporting a rising variety of tasks in their jobs. The same survey identified advanced literacy, learning, adaptability, persuasion and ICT skills are the skills for which demand is increasing most.

Figure 3.3: Share of jobs with rising variety of tasks by occupation (2014)
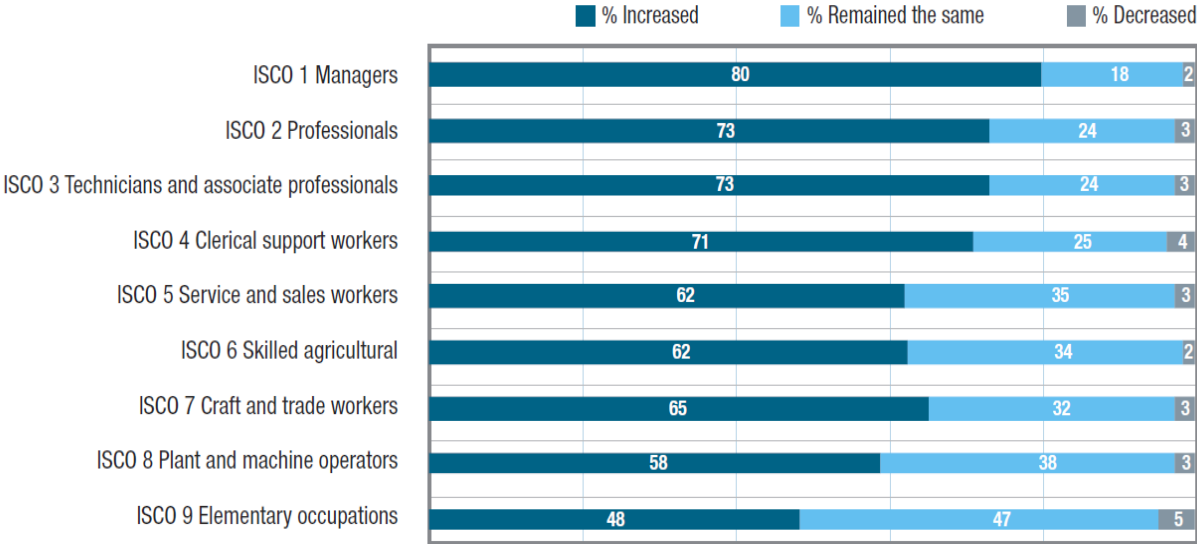
Source: CEDEFOP (2015) Responses to the question: 'On a scale from 0 to 10, where 0 means it has decreased a lot, five has stayed the same and 10 has increased a lot, has the variety of tasks increased, decreased or stayed the same since you started your job with your current employer?'

30.   As noted, the evidence on the extent to which today's tertiary graduates actually possess the kinds of skills needed to thrive in a changing economic environment is limited. Alongside high employment rates, across the EU, tertiary graduates also continue to enjoy higher earnings that their counterparts with lower levels of educational attainment[29]. This suggests that graduates' skills are still strongly valued and rewarded on the European labour market. Nevertheless, there are signs that a – sometimes significant - proportion of graduates are leaving higher education with comparatively poor generic skills levels.

31.   On the basis of a wide-ranging survey of young people, education providers and 2 600 employers across Europe, a recent report found a widespread perception that education and training systems at all levels are not equipping students with the skills they need. The report concluded that 'too many students are not mastering the basics, with businesses reporting a particular shortage of "soft" skills such as spoken communications'[30].

32.   More worryingly, the OECD's Survey of Adult Skills (PIAAC), undertaken in 2012, provided an assessment of literacy, numeracy and problem-solving in technology rich environments among the adult population in OECD countries. The assessment revealed a significant share of young tertiary graduates with literacy skills below level 3 on a scale of

---

[29]   On average across the OECD, young tertiary education graduates earn 40% more than those with only upper secondary-level qualifications, when measured three years following graduation (OECD Education at a Glance 2016, Figure A6.a)

[30]   McKinsey Center for Government (2014)

one to five, ranging from under 10% in Finland to over 30% of the sample tested in Ireland, Slovenia, Spain and Greece. This suggests that many graduates would have difficulty in 'performing multiple-step operations to integrate, interpret, or synthesise information from complex or lengthy texts'[31]. These data focus only on literacy, but do raise questions about the wider set of skills with which some graduates are leaving higher education.

33.   An overview of the incidence of skills and education mismatch in EU countries, based on PIAAC data, is provided in the JRC report Flisi et al. (2014)[32]. The study highlights the importance of carefully conceptualising mismatch, because education and skill mismatch do not measure the same phenomenon. The report shows that only a small percentage of individuals are mismatched with respect to both education and skills, whereas the majority are mismatched with respect to either education or skills only. Pellizzari et al. (2015) look at skills mismatch in the domain of problem solving in technology rich-environments (i.e. digital skills) using PIAAC data for the 13 countries of the European Union (plus the US) for which data are available. Their results indicate that, on average, about 87% of the workers are well-matched[33], about 10% are over-skilled and 3% under-skilled. Significant differences among EU countries emerge.

---

[31]   OECD (2013)
[32]   See Flisi et al. (2016).
[33]   A worker is considered well-matched if her ICT skills fall in between the minimum and maximum requirement of the occupation in which she is observed, as under-skilled if they fall below the minimum and over-skilled if they are above the maximum.

Figure 3.4: Average score in literacy of tertiary graduates (20-34)
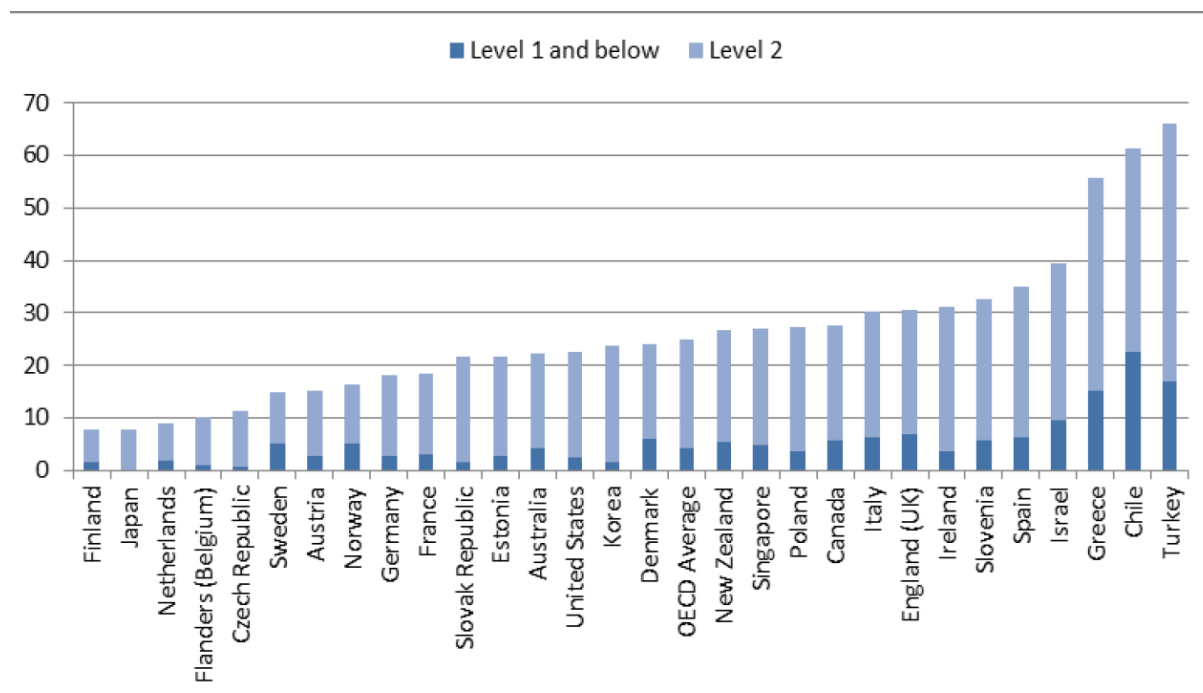
Source: OECD (Survey of Adult Skills, PIAAC, first cycle, 2012)

3.2 Promising approaches to high-level skills development

34. Addressing sector-specific skills shortages and enhancing skills acquisition across higher education is likely to require action by higher education institutions, governments and other stakeholders at different levels. In light of the focus of policy at national level in the EU and elsewhere and taking into account international evidence, four aspects appear to be particularly important:

- Improving intelligence on skills needs and graduate outcomes;

- Preparing students and influencing study choice;

- Effective design of programmes and curricula and;

- Support for teaching staff in higher education.

3.2.1 Improving intelligence on skills needs on graduate outcomes

35.   In order to design and implement effective higher education provision, which is relevant to the needs of modern society, practitioners and policy-makers need an informed understanding of how high-level skills needs are evolving and how well higher education is already doing in preparing graduates for an evolving world of work.

36.   Skills forecasts and analysis of skills shortages, such as those undertaken at European level by CEDEFOP[34], provide a valuable input for those in charge of steering higher education systems and developing programmes to meet demand. At national level in the EU, a recent report found authorities in nine EU countries regularly use labour market information in the planning and management of higher education[35]. While these kinds of exercises provide a general picture of the state of play and the direction of travel in terms of skills needs, they need to be complemented by more qualitative and fine-grained intelligence. Current and future skills requirements are increasingly a topic for structural cooperation and dialogue on between higher education, business and public sector employers at national and regional level in the EU, although patterns of cooperation vary considerably across the EU[36].

37.   In parallel, progress is being made in assessing how well higher education prepares people for life – in work and beyond – through using graduate tracking information to analyse the way graduates enter the labour market after graduation and subsequently progress professionally and personally. 'Graduate tracking' is a term that covers a range of different methods used to collect factual information about graduates and their status, as well as qualitative feedback and opinions from graduates themselves. The most commonly used approaches to tracking graduates rely on different forms of administrative data (from education, tax and social security databases) and/or dedicated graduate surveys conducted at system level or by individual higher education institutions.

38.   What graduates do after graduation is naturally influenced by economic circumstances - in particular, the state of the economy in the place where they go on to live - and personal life choices. However, it is clear that what people study, where and how they study and what they learn also influence their subsequent development. Information on graduate outcomes and feedback from graduates can thus be valuable for education providers, policy makers and those involved in guiding future students in their study choices (see also next section).

39.   In Europe, many countries are currently in the process of developing or refining the mechanisms they have in place for graduate tracking. This means the situation on the ground is constantly evolving. Recent studies suggest, however, that more than half of the 33 EU and European Economic Area countries have some form of regular tracking mechanisms for tertiary graduates in place at system level[37] and a little under half use some form of system-wide graduate surveys[38]. In the last decade, most EU countries have also introduced systems

---

[34]   CEDEFOP (2015) (2016a)
[35]   Eurydice (2014) Ireland, France, Italy, Latvia, Lithuania, Poland, Romania, Finland, the United Kingdom
[36]   See Eurydice (2014), Chapter 4
[37]   EUROGRADUATE Consortium (2014)
[38]   Higher Education Authority (2015)

to collect data on the transitions to the labour market of graduates from vocational education and training[39]. Current national tracking systems in Europe, in so far as these exist, do not generally collect data that can be compared directly with data from other (higher) education systems, in particular because of different definitions of variables and sample populations. This is one of the key reasons why the recent Eurograduate feasibility study[40] has recommended that a European graduate survey would be able to deliver valuable additional, internationally comparable information to complement data from national graduate tracking exercises.

EUROGRADUATE FEASIBILITY STUDY: KEY RECOMMENDATIONS

Finalised in 2016, this project examined the feasibility and desirability of establishing a more systematic and sustainable form of pan-European survey of graduate outcomes. The study concluded that there was considerable appetite among policy makers and stakeholders in different countries for comparable data on graduate outcomes across European systems. The study recommended that a European graduate survey be established with a number of core characteristics:

- A geographical focus on the EU and EEA countries;
- A centralised online survey with a standard set of core questions for all countries and the possibility to add additional questions for individual countries;
- Decentralised recruitment of graduates to take part in the survey in each national system[1] by organisations / institutions that hold the relevant contact details;
- Coverage of Bachelor and Master's graduates, with the option to include graduates from short cycle programmes, if appropriate;
- A panel survey approach, in which the same respondents are surveyed repeatedly, indicatively at one, five and (possibly) nine years after graduation;
- An initial survey round, simultaneously covering graduates having completed their studies one and five years earlier;
- Subsequent rounds of surveying every four years.

Source: EUROGRADUATE Consortium (2016)

3.2.2 Preparing students and influencing study choice

40.   'Upstream' actions focused on prospective students are an important element in coordinated approaches aimed at ensuring more graduates leave higher education with relevant skills. New students need to be as well prepared as possible for the learning challenges within higher education and to be in a position to make a well informed choice about which subjects to study.

41.   Systematic cooperation between higher education institutions and schools and Vocational Education and Training providers is important to build understanding between those working in different parts of the education and training systems, as well as familiarise prospective students with the reality of higher education. Such cooperation is promoted in

---

[39]   CEDEFOP (2015b)
[40]   EUROGRADUATE Consortium (2014)

several EU Member States as part of wider efforts to increase the interest of school and VET students in further study in fields where shortages exist, in particular in Science, Technology, Engineering and Maths (STEM). National STEM promotion bodies, such as the National Platform Science and Technology in the Netherlands[41], facilitates inter-sectoral cooperation between educational providers at different levels, employers, sector organisations and government with the objective of stimulating interest in, and uptake of, scientific subjects in which the country has a skills shortage. The promising results of this and other national STEM promotion bodies have encouraged the creation of the EU STEM coalition[42], as an EU-level platform for sharing good practice.

THE EU STEM COALITION

Supported by Erasmus+, the main goal of the EU STEM Coalition is to raise awareness among governments, industry and education providers, at national and European level, about the crucial role of STEM education in our society. Its long term vision is to bridge the skills gap by having a STEM strategy in place in all EU member states. The Coalition strives to support the establishment of STEM strategies by closely involving government, education and industry. To reach this goal the Coalition has set three main objectives:

- Strengthen existing national STEM Platforms
- Support the development and implementation of national STEM platforms in countries that do not have a platform in place yet
- Anchor the STEM platforms into European and national policy frameworks

Source: EU STEM Coalition

3.2.3 Effective design of programmes and curricula

42. Recent decades have seen a shift in higher education towards designing programmes and curricula to help students acquire pre-defined learning outcomes. This move towards greater student-centred learning and a growing concern with graduates' employability, as well as broader learning experience, have triggered a change in the way curricula and pedagogical approaches are designed[43]. The Bologna reforms implemented from 1999 onwards[44] have also been instrumental in increasing attention to the acquisition of transferable skills- or "soft", "generic" or "21st century" skills alongside subject-specific skills across European higher education. Teaching staff and institutions are increasingly focusing on the design of learning, with detailed consideration of the pedagogical techniques that are most suitable to teach a particular subject and to reach the desired learning outcomes.

43. On campus, there has been an increased focus on problem and inquiry-based learning, where students apply knowledge to develop responses to specific (often real-world) problems.

---

[41] https://www.platformbetatechniek.nl/extra/english
[42] http://www.stemcoalition.eu/
[43] Heywood, J; et al (2015)
[44] Introducing, among other reforms, the three cycle structure and a greater focus on learning outcomes.

At the same time, through blended learning[45] and 'flipped classroom' approaches[46], technology is increasingly being used to allow classroom and laboratory time to be spent on interactive activities, problem-solving and discussion, rather than absorption of knowledge. In a 2015 survey undertaken in France, Germany, Poland, Spain and the UK, 72.1% of universities stated that they used blended learning at Bachelor, Master or doctoral levels and 43.4% stated that they had implemented a flipped classroom[47]. More inter-disciplinary programmes or options for inter-disciplinary study combinations, including those that combine arts and sciences (STEAM - Science, Technology, Engineering, Arts and Maths), have been introduced in many universities. There are also approaches, particularly in research-intensive universities, which seek to involve undergraduate students more closely in the research undertaken in the institution where they study, with a view to both improving the research and developing students' interest and skills in research[48].

44. Alongside moves to change the way learning is structured inside the walls of higher education institutions, there are ongoing discussions about the best way to incorporate 'external experience' – in particular work-based learning and international mobility – into programmes to enrich students' skills development.

45. These changes are primarily happening within individual departments and higher education institutions. However, governments and system regulators are increasingly paying attention to effective learning environments and the organisation of learning in their strategy, as illustrated by the most recent Dutch Higher Education Strategy[49].

DUTCH STRATEGIC AGENDA FOR HIGHER EDUCATION 2015-25

The Dutch strategic agenda for higher education identifies particular factors that create a favourable environment for development of skills, including critical reflection, cooperation, creativity and results orientation. Specific areas of focus that will be supported through additional funding in the coming years include:

- Small scale learning communities (student-teacher interaction, individualised support and feedback)
- Rich learning environments intertwined with research, professional practice, internationalised classrooms, online education, and new learning environments
- Flexible lifelong learning (demand-driven education experiments, piloting learning pathways and a 'lifelong learning credit')
- Sustainable regional and sector-based collaboration (engagement with the society and labour market);
- Stronger labour market links (entrepreneurship education, alumni policies and stronger orientation of the Universities of Applied Sciences centres of expertise to societal challenges).

---

[45]   Blended learning is an education program (formal or informal) that combines online digital media with traditional classroom methods.

[46]   The flipped classroom is an instructional strategy that reverses the traditional learning environment by delivering instructional content, often online, outside of the classroom and moving activities into the classroom

[47]   Joint Research Centre (2016a)

[48]   Fung, D et al (2017)

[49]   De waarde(n) van weten: Strategische Agenda Hoger Onderwijs en Onderzoek 2015-2025

Exploiting the potential of open and online learning…

46.   One aspect of the drive to modernise higher education has focused on the use of digital technologies to stimulate innovation, personalisation and wider access to higher education. This encompasses the use of technology, highlighted above, to change the organisation of learning within traditional higher education settings, as well as the provision of new types of online or blended advanced learning course. It involves established higher education institutions, changing their existing activities or developing new ones, and new actors – in particular private companies – from outside the traditional world of higher education. Open and online learning promotes multiple ways of teaching and learning, building and sharing knowledge, widening access to education, as well as connecting formal and non-formal learning. The JRC's OpenEdu Framework proposes 10 dimensions in which higher education institutions can become more open and modernise education via the use of digital technologies[50].

47.   While the European University Association's 2015 Trends report[51] found that digitalisation is one of the key issues on HEIs' agendas and much is already happening in the field, 45% of those responding to the Commission's online consultation in 2016 expressed concerns that technology is not yet being used effectively to improve teaching and learning in higher education[52]. Within existing higher education institutions, digitalisation is seen primarily as a tool to enhance the quality education, face-to-face teaching and to improve assessment methods[53]. Expansion on online courses and the 'unbundling' of educational programmes into smaller courses that can be delivered online are also seen as a means to widen access to higher learning, particularly for those already in the labour market.

48.   To date, use of technologies for learning and teaching has primarily depended on individual departments and teachers. Institutions have invested in technology, but often not as part of a coherent digitalisation strategy. Furthermore, while the potential of technology to support effective, interactive and inter-disciplinary learning approaches is considerable, there is evidence that blended or online formats are not always being used for pedagogical innovation. Many online courses simply transfer traditional lectures to an online platform[54].

49.   Following initial hype that peaked in about 2012[55], global interest in, and take up of, Massive Open Online Courses (MOOCs) is growing. The private MOOC platform Coursera has 22 million registered learners, while Udacity has developed new forms of 'nanodegrees' in technology-focused areas in partnership with employers, using a paying model with incentives for timely completion[56]. Much of the content for MOOCs available today is provided by established higher education institutions[57], with staff drawing on elements of

---

[50]   Joint Research Centre (2016b)
[51]   Sursock, A. (2015)
[52]   European Commission (2016a)
[53]   Fung, D et al (2017), Heywood, J; et al (2015)
[54]   Heywood, J; et al (2015)
[55]   The New York Times declared 2012 the year of the MOOC
[56]   The Economist (2017) Learning and earning: Special Report, 12 January 2017
[57]   Joint Research Centre (2016c)

existing programmes to create short courses that result in 'microcredentials'. In a 2015 survey undertaken in France, Germany, Poland, Spain and the UK, 22% of HEIs declared that they were offering MOOCs and 19% were planning to do so[58].

50. This process of 'unbundling' of educational content into smaller components has been likened to the developments in the music industry, with the shift from selling albums to selling songs. The short courses created are easier for people already in work to access and absorb, and are often followed also as a means of lifelong learning by (educated) individuals who are either unemployed or low earners. However, it is far from clear to what extent such provision can replace the experience of a three or four-year degree for most students. Moreover, question marks remain over the optimal role of higher education institutions in providing online courses. While established institutions, with their academic record, are still seen as necessary to guarantee the quality of courses in most cases, it is not always easy to combine the dynamics of fast-changing online provision with the structures in place for providing on campus bachelor and master's degrees. This thus remains an evolving area.

3.2.4 Support for teachers in higher education

51. Changing the way learning and teaching are carried out requires committed and informed teaching staff. Some countries and/or individual higher education institutions are establishing national agencies to support institutions and staff to improve the design of their courses, their teaching skills and to support them in using technology to improve teaching and assessment. Examples include the Higher Education Academy in the UK, SURF in the Netherlands and the PULS Pedagogical Development Centre in Norway. At the same time, national authorities increasingly require teachers in higher education to have specific qualifications in teaching.

> **HIGHER EDUCATION ACADEMY (UK)**
>
> In the UK, the Higher Education Academy operates a fellowship scheme which requires individual teaching staff to create a portfolio of evidence of reflective practice, demonstrating achievement of the competences defined in the National Professionals Skills Framework. Universities are required to report on the number of staff holding this accreditation. While there is no formal requirement for certification, many institutions require staff to achieve accreditation soon after taking up their appointment.

52. Quality teaching encompasses effective design of curriculum and course content, a variety of learning contexts (including guided independent study, project-based learning, collaborative learning, experimentation, etc.), soliciting and using feedback, and effective assessment of learning outcomes. It also involves well-adapted learning environments and student support services. The report of the High Level Group on the Modernisation of Higher

---

[58]   Joint Research Centre (2016a)

Education of June 2013[59] stressed the importance of clear strategies to support good teaching at institutional level within HEIs and adequate investment in Continuing Professional Development for staff. An Erasmus+ project lead by the European University Association is currently assessing the feasibility of additional European-level cooperation to support the enhancement of teaching in higher education[60].

EUROPEAN FORUM FOR ENHANCED COLLABORATION IN TEACHING - EFFECT (2015-18)

The project focuses on the following interlinked objectives: a) Facilitating exchange and collaboration between European actors and stakeholders for the enhancement of higher education teaching; b) identifying good practices and develop new and innovative approaches to learning and teaching enhancement; c) supporting institutions in the development of strategic approaches to the enhancement of learning and teaching and d) developing a model for a sustainable European structure for the enhancement of learning and teaching

The project is reflecting on several grand challenges for higher education teaching, such as the growing and ever more diverse student body; drop-out and retention; maximising opportunities and addressing the challenges of ICT-based learning; or recognising teaching excellence and its link to student success. Based on the expected outcomes, it may provide policy recommendations taking into account the European perspective and with the aim of enhancing higher education teaching.

---

[59] High Level Group on the Modernisation of Higher Education (2013)
[60] http://www.eua.be/activities-services/projects/current-projects/higher-education-policy/effect

4 SOCIAL INCLUSION AND CIVIC ENGAGEMENT

4.1 Social divisions and European higher education

53. Recent events in Europe have illustrated both the challenges of integrating marginalised groups and newly arrived migrants and the extent to which some sections of society feel alienated from established institutions and elites. There is a growing acknowledgement that higher education must play its part in tackling social divisions and promoting more inclusive societies. An increasing body on work on the 'social responsibility' of higher education[61], points, in particular, to the role of higher education institutions in supporting greater diversity in the groups of people they educate and employ and through breaking down real or perceived barriers between the academy and the rest of society.

54. The diversity of the student population is probably the issue most commonly discussed in relation to the 'social dimension' of higher education. At European level, in 2009, ministers from countries participating in the Bologna Process formally agreed that 'the student body within higher education should reflect the diversity of Europe's populations'[62]. Increasing 'participative equity' – and particularly increasing participation in higher education among traditionally under-represented social groups - is firmly on the agenda in EU Member States. However, across the EU, people from lower socio-economic groups continue to stand a lower chance of gaining a tertiary qualification than their peers from better-off backgrounds.

55. Data on the social background of the student and graduate population is difficult to compare across countries, in particular because of underlying differences in the social make-up of different national populations and different definitions of social categories. However, evidence on the social background of students from individual countries taking part in the Eurostudent survey[63] illustrates the dominant pattern of current participation in higher education.

56. As just one example, Figure 4.1 shows the proportion of students in Ireland in the latest round of Eurostudent reporting that their fathers fell into one of nine standard occupational categories and compares with the proportion of men aged 40 to 60 in these occupational categories in the Irish population as a whole. The results show that the children of 'managers' are comparatively over-represented in the student body, compared to the make-up of the overall population, whereas the children of 'technicians and associate professions' and plant / machine operators' are comparatively under-represented. The data, which correspond closely to the results of similar national analyses in Ireland, show that despite the countries very high levels of participation in higher education[64], the make-up of the student body still doesn't reflect the make-up of society. Although Ireland appears to have one of the

---

[61] See, for example, the EU-University Social Responsibility project http://www.eu-usr.eu/
[62] Communiqué of the Conference of European Ministers Responsible for Higher Education, Leuven and Louvain-la-Neuve, 28-29 April 2009
[63] Eurostudent (2015)
[64] As shown in Figure 2.3, Ireland has the fourth highest tertiary education attainment rate in Europe

more equitable higher education systems in Europe on this measure, the example demonstrates that large-scale expansion of access to higher education does not necessarily lead to a situation of complete 'equity'.

Figure 4.1: Occupational status of students' fathers compared to overall population profile in Ireland
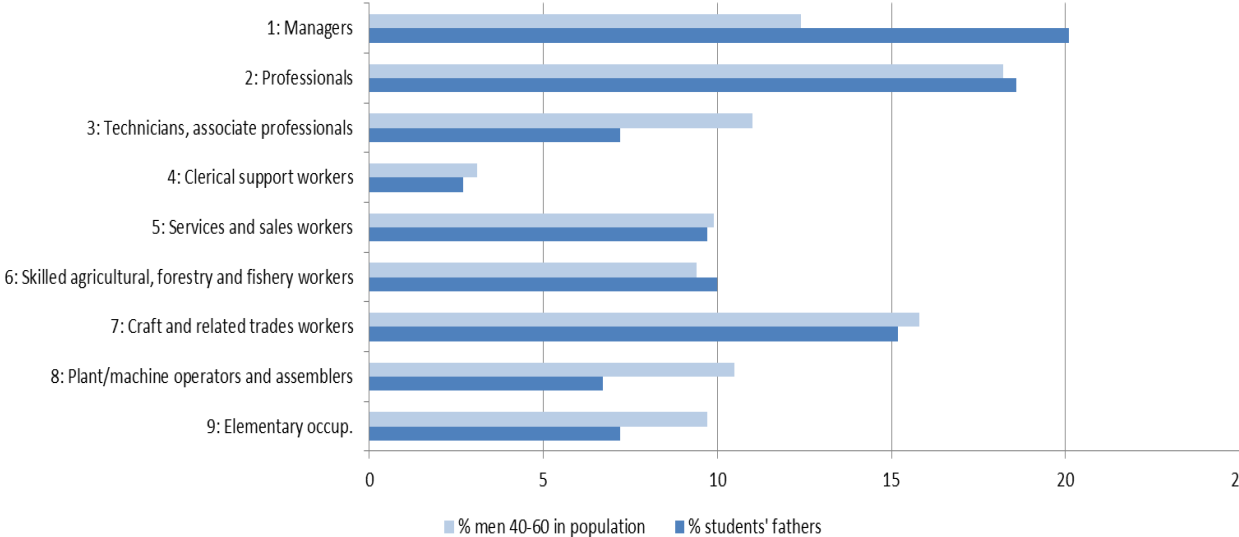
Source: Eurostudent (2015)

57. Alongside socio-economic background, age and existing occupational status have a major influence on participation in higher education. Despite an increased focus on lifelong learning in national policy frameworks, relatively few people who are already working go into or back to higher education to upgrade their skills. This all means talent is going untapped and puts an additional brake on social mobility.

Figure 4.2: Proportion of students enrolled in higher education aged 30 or over 2014
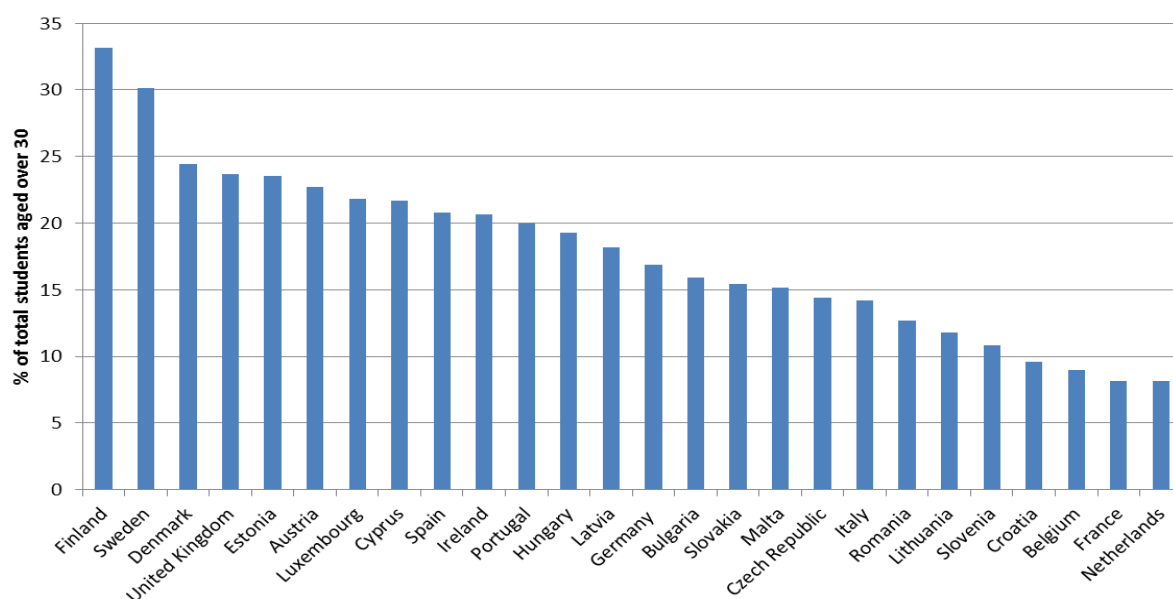
*Source: Eurostat [educ_uoe_enrt02] No data for Greece or Poland*

58.   Figure 4.2 shows the proportion of enrolled students aged 30 and over in EU Member States. These figures are affected by factors like the average time taken to complete a first tertiary qualification and the propensity of students to continue to Master's level, but also provide a proxy for participation in higher education among people entering from the labour market rather than directly from school. The highest rates of participation among 'mature' students are seen in the Nordic countries and the UK, with significantly lower rates in countries such as Belgium, France and the Netherlands. These data cover students participating in full and part-time courses leading to a standard tertiary education qualification in the countries concerned[65]. Other types of learning provision by higher education institutions, such as Continuing Professional Development (CPD) or short online courses are not included.

59.   The question of the social responsibility of higher education also encompasses the broader contribution of higher education institutions to society at large. Here, two frequent issues are the real (and perceived) social contribution of higher education institutions to the wider communities where they are located and the role of higher education in providing civic values.

---

[65]   At ISCED 5 to 8

60. As centres of knowledge and expertise, HEIs, their staff and students have considerable potential to contribute to the broader well-being of their communities, by promoting innovation in social, as well as economic[66], spheres. However, although more and more HEIs are actively discussing and promoting their broader social responsibility, they are doing so in a climate where public trust in public institutions is falling. Figure 4.3 illustrates the declining level of trust in national political institutions since the economic crisis. Although no equivalent data exist on trust in higher education in Europe, research from the US has highlighted that similar trends in public trust are evident in relation to higher education[67]. This implies that HEIs need not only to reflect on how they contribute to their communities, but also how they demonstrate how they contribute to society.

Figure 4.3: Public trust in national governments, parliaments and political parties 2008-2013
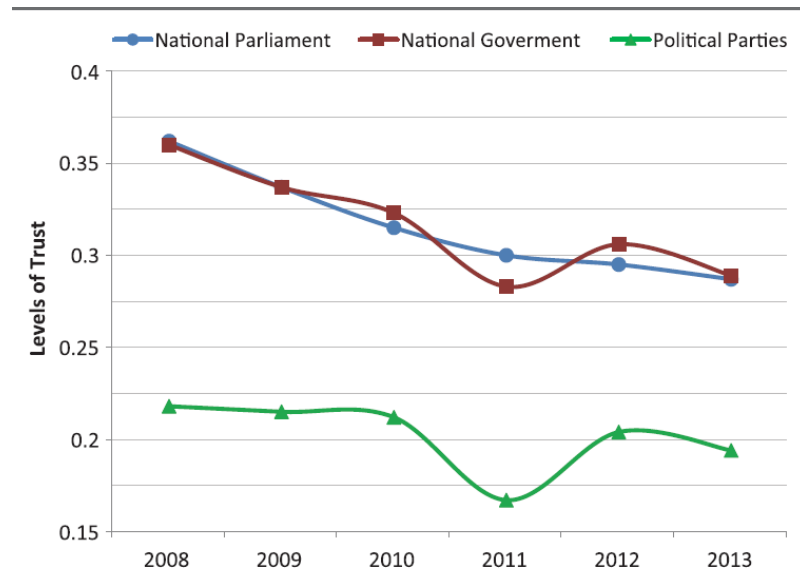
Source: European Research Centre for Anti-Corruption and State-Building, Hertie School of Governance (2015) based on Eurobarometer results

4.2 Promising approaches

61. Governments and higher education institutions across the EU are developing and refining their strategies to enhance social equity within higher education and to support increased links between higher education and the rest of society.

4.2.1 Creating the conditions for inclusion and study success

62. In order to increase attainment levels, higher education systems need to continue to widen participation and improve completion in higher education. Improved completion rates are also an important factor for improved efficiency and returns on public investment.

63. With more students and students with more diverse profiles entering higher education, there is an opportunity to reform support measures, considering academic and non-academic

---

[66]   See Section 5
[67]   The annual meeting of the Association of American Colleges and Universities in January 2017 focused on restoring public trust in higher education https://www.aacu.org/meetings/annualmeeting/am17

aspects of institutional mission statements; putting in place more holistic systems able to cater for the individual needs throughout the study cycle.

64.   Several Member States and institutions have introduced measures often centring on targeted funding such as performance-based agreements with clear targets concerning completion, specific financial support for non-traditional students, funding for institutions, regulation of access to higher education, including tracking students at risk of dropping out, and higher education reforms, including introducing a wider landscape of programmes. All measures are to allow attracting potential students and tapping into real talent regardless of educational and socio-economic background. Holistic support measures require viewing the issue of widened participation and completion an integral part of the academic mission.

65.   Institutional strategies and activities – sometimes encouraged by policy in the field, other times existing despite the lack of policy – to accommodate the diversity of needs of a wider student body can also found across Europe. A common denominator for successful measures is that these incorporate both academic and non-academic support as well as monitoring and guidance of teaching and learning results throughout the study cycle, especially during the first study year.

66.   Governments, higher education institutions and grassroots organisations, many comprising students and staff, have also developed many initiatives to support the integration of asylum seekers, migrants and refugees. At European level, the three priority areas of support are information sharing[68], funding through Erasmus + and the recognition of qualifications and prior learning.

TARGETING ERASMUS+ ONLINE LINGUISTIC SUPPORT FOR MIGRANTS

Within Erasmus+, 100,000 Online Linguistic Support (OLS) licences for language assessments and the same number of licences for online language courses have been made available to refugees for a period of 3 years, until July 2019, with a budget of €4.18m. The aim is to support the efforts of EU Member States to integrate refugees into Europe's education and training systems and ensure their skills development by giving them access to OLS online language courses.

25 National Agencies are currently using licences and more than 4 500 refugees have started using OLS. Amongst them, 3 500 are currently following OLS courses to learn a language (April 2017). Statistics show that they are using OLS courses very actively.

Refugees have access to a first language test to assess their initial level, followed by an online course in the language of their choice (Czech, Danish, Dutch, English, French, German, Greek, Italian, Polish, Portuguese, Spanish or Swedish). The online course includes live tutoring and interactive activities and is compatible with mobile devices. At the end of the course, refugees can take a final test to assess their new language level. People who are working in direct contact with refugees can also receive an access to the OLS platform for instruction and support purposes, so that they can assist and guide the refugees in their use of the online courses.

---

[68]   http://ec.europa.eu/education/policy/migration/higher-education-refugees_en

4.2.2 Linking higher education institutions and their communities

67. The concept of the 'civic university', already highlighted in Section 2, provides a theoretical model for social responsible higher education institutions engaged in the society around them[69]. The model sees engagement with the outside world as an integral part of HEIs' activities in education and research (education, research and 'engagement' thus overlap and interact) and softens the boundary between higher education (the academy) and society. The softer boundary and increased permeability between HEIs and the world around them is conceived as mutually beneficial for the academy and society, supporting social equity goals, improved learning and teaching and enhancing the relevance and impact of research.

Figure 4.4: The 'Civic University'
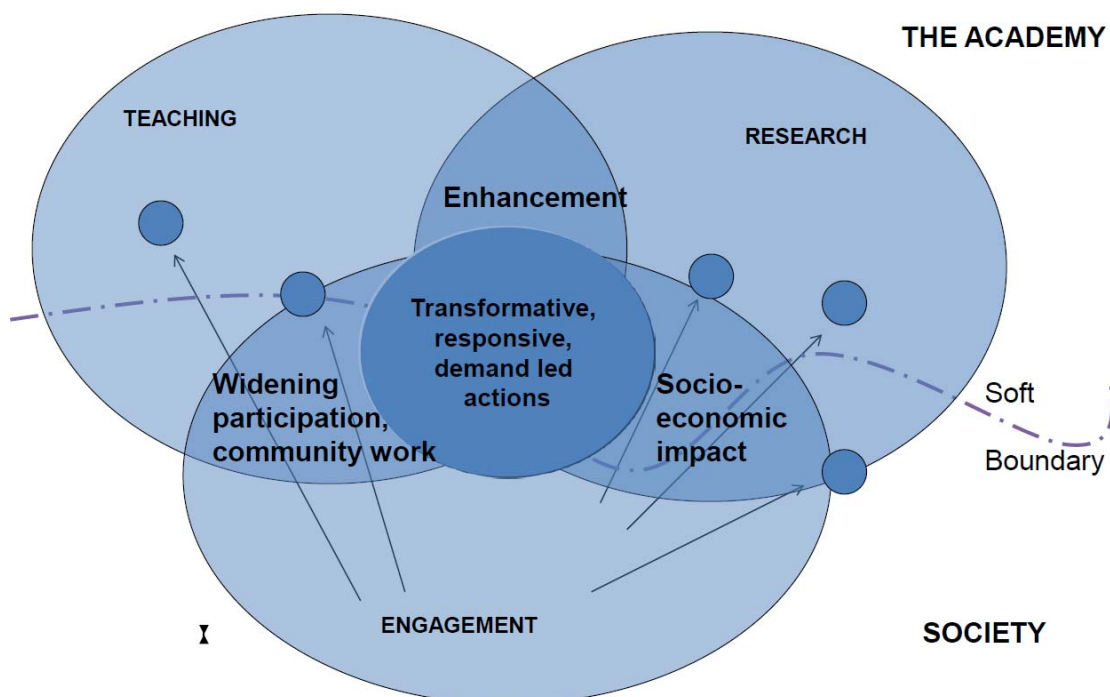
Source: Goddard, J. (2014)

68. In practical terms, efforts to strengthen the interaction between higher education and 'society' often focus on the links between higher education institutions (and their communities of students and staff) and the cities and towns where they are located (and their wider communities, city authorities, businesses and civil society organisations). The EUniverCities network[70], a network of 14 medium-sized European cities and their universities, has been established to exchange and spread knowledge, expertise and experience about city-university cooperation in Europe. The focus is on how to shape different types of cooperation between universities and the rest of the city for the mutual benefit of all parties. Through peer reviews and on-going cooperation, the network examines how effective cooperation can be developed

---

[69]   Goddard, J. (2014)
[70]   http://eunivercitiesnetwork.com/

in different thematic areas: city attractiveness and marketing; the local and regional economy; students and city life; science and society and internationalisation.

UNIVERSTIY-CITY COOPERATION: THE EXAMPLE OF GHENT

Ghent, one of the partner cities in EUniverCities, provides an example of the different channels through which successful cooperation can be developed between universities and their city, as well as some of the challenges faced in this field. The experience of Ghent is illustrative of approaches and challenges seen in many university cities across Europe. University-city cooperation in Ghent spans a broad range of areas, including urban regeneration, economic development, innovation, culture, and citizen involvement in science. Key examples of links include:

* The regeneration of a former industrial area called **De Krook**, including location of new university buildings and the **Imec R&D and innovation hub** focusing on nano-electronics and digital technologies. The university played a key role in bringing forward the redevelopment and acts as one of the 'anchor' organisations in the new neighbourhood.
* **Ghent Living Lab**, a joint project by the university and the city council, provides a place where users / citizens, creative forces, experts, entrepreneurs and researchers are brought together to work on innovation projects.
* The City of Ghent directly supports Ghent University's **'Dare to Venture'** initiative, which integrates entrepreneurship experience in study programmes, coaching the students who want to create their own business
* '**StuGent**' is a student consultative body that acts as a linking point between the student population and the city authorities.
* **Science kits for teachers**: the VIB institute for biotechnology, whose researchers work on Ghent University campus, have developed support materials for school teachers, to make a direct link between the work of the institute and what pupils learn in the city's schools.

A peer review by partners from other EUniverCities partner cities in late 2014 highlighted the many successful aspects of university-city cooperation, but also underlined the common challenge of how to help the student population and the rest of the city population interact and co-habit the same city in harmony. The co-existence of a permanent resident population and an often temporary, non-resident student population can create tensions. Stakeholders in Ghent are working to overcome these.

5 INNOVATION AND SMART SPECIALISATION

5.1 Innovation challenges in European higher education

69. Responding effectively to the needs of an innovation-based economy is challenging for higher education institutions. It implies a concerted focus on nurturing the 'ingredients' for future innovation in all areas of higher education institution activity, from undergraduate education to doctoral training, research and cooperation with business and civil society. Despite the limits of our understanding of how innovation actually 'happens'[71], there is broad agreement that highly skilled, creative, entrepreneurial people and effective cooperation networks between different organisations and across sectors are among the most important ingredients.

Figure 5.1: Future of Jobs: top 10 skills

in 2020	in 2015
1. Complex Problem Solving	1. Complex Problem Solving
2. Critical Thinking	2. Coordinating with Others
3. Creativity	3. People Management
4. People Management	4. Critical Thinking
5. Coordinating with Others	5. Negotiation
6. Emotional Intelligence	6. Quality Control
7. Judgment and Decision Making	7. Service Orientation
8. Service Orientation	8. Judgment and Decision M.
9. Negotiation	9. Active Listening
10. Cognitive Flexibility	10. Creativity

Source: World Economic Forum (2016)

70. A 2016 survey by the World Economic Forum[72], focusing on the impact of technological change, found that employers rank 'creativity' as one of the top three attributes or skills needed in the workplace by 2020. It features alongside complex problem-solving and critical thinking. To date, there has been little empirical analysis of how effective higher education is at stimulating creativity, but there are concerns about the effectiveness of existing higher education provision in this area. In the public consultation on the EU's modernisation agenda for higher education, fewer than half of respondents overall and fewer than 40% of students and recent graduates agreed with the statement that 'current programmes encourage students to be creative and innovative'[73].

71. Recent discussions among international stakeholders and policy makers in higher education organised by the OECD[74] have highlighted that, while many higher education institutions have designed programmes based on new pedagogies with the explicit objective to stimulate students' innovation skills, including creativity and critical thinking, significant challenges remain in this area. In particular, definitions and approaches to assessment of transversal attributes like creativity and critical thinking vary considerably between individual academics, teaching staff lack knowledge on effective pedagogical techniques to stimulate

---

[71]   See European Political Strategy Centre - EPSC (2016)
[72]   World Economic Forum (2016)
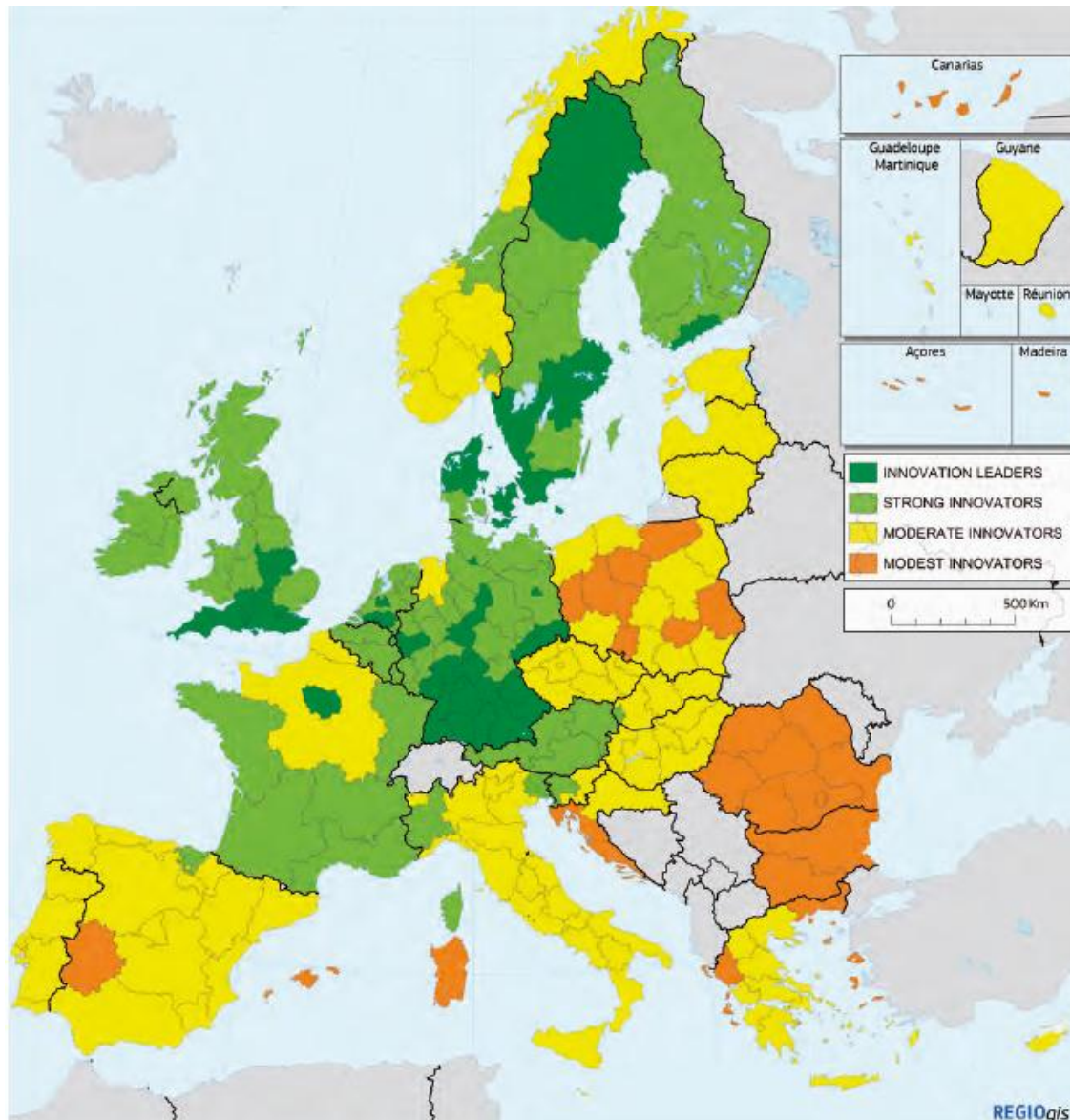[73]   European Commission (2016a)
[74]   See OECD (2016b)

these skills and institutional structures, focused on research, do not necessarily provide conducive frameworks for increased focus on creativity.

72.   The capacity of higher education institutions, their staff and students to engage actively in activities to support innovation in their localities and regions depends both on the culture and will within the HEIs concerned and the broader innovation capacity of the locality or region. The EU's regional innovation scoreboard, which provides a broad indication of the existing innovation capacity of EU regions, illustrates the extent to which higher education institutions across the EU are working within very different contexts. While Europe's most innovative regions lie primarily in northern and western Europe, innovation capacity in regions in the east and south of Europe is considerably lower. These different starting points naturally have an influence on the appropriate strategies, which may include a focus on stemming brain drain, for HEIs in the regions concerned.

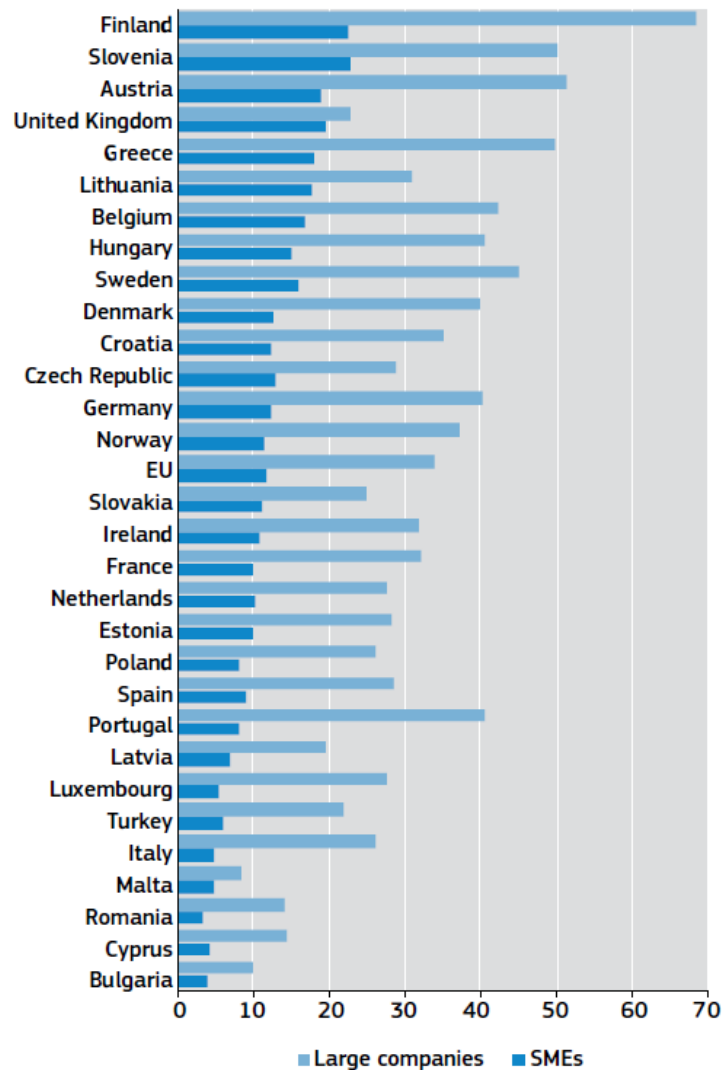**Figure 5.2: Regional Innovation Scoreboard 2016**

Source: European Commission (2016c)

73.   Proximity between creative people and close networks of cooperation between knowledge-intensive organisations – including HEIs and business - are an important factor in fostering regional innovation. Available indicators show that existing patterns of cooperation between higher education and innovative businesses vary considerably across the EU.

74. The last Community Innovation Survey (CIS), undertaken in 2012[75], identified enterprises that were undertaking some form of product, service or process innovation and then asked representatives of these organisations about the cooperation with external partners, including higher education institutions. In all countries surveyed, large companies reported that they cooperated on innovation with universities or other HEIs more frequently than small and medium-sized enterprises (SMEs). Moreover, whereas over or around 20% of SMEs in Finland, Slovenia, Austria and the UK reported that they cooperated with universities, the figure was 5% or less in Italy, Malta, Romania and Bulgaria.

75. More qualitative work examining the ways HEIs can contribute to regional economic development and Smart Specialisation Strategies has

Figure 5.3: Innovative enterprises co-operating with universities or other higher education institutions (2012)

Source: European Commission (2016b)

highlighted the main barriers the higher education sector faces in these areas. Higher education policy in many countries still lacks a territorial dimension, meaning there might not be strong incentives for HEIs to engage in activities to contribute to innovation at regional level. In structurally weaker regions, even if there is a comparatively strong university, there may be limited 'absorptive capacity' in local businesses to cooperate effective with academic partners. And within individual universities, the focus on regional innovation very often depends on individual institutional leaders and academic staff, rather than an institution-wide strategy[76].

---

[75] http://ec.europa.eu/eurostat/web/microdata/community-innovation-survey
[76] Joint Research Centre (2014)

5.2   Promising approaches

5.2.1   Promoting entrepreneurship, creativity and innovation skills

76.   Higher education institutions increasingly recognise that they must afford young minds the opportunity to develop skills that inspire, encourage and enable innovation. Although it is difficult to make explicit links between specific skills and innovation, there is a move towards rethinking education and training programmes to promote the combined skills of creative and critical thinking, entrepreneurship, problem-solving, risk-taking and resilience, management, communication, exploiting the results of research and independent analysis. Promoting, assessing and rewarding these skills sets in higher education, alongside acquisition of detailed subject knowledge, is one of the challenges faced by teaching staff across Europe.

77.   A step in this direction is the FINCODA project[77] led by Turku University of Applied Sciences that aims to develop a tool to assess students' 'innovation competences' during their studies and comprises a plan for training teachers to use the criteria. A further extension of FINCODA thinking is an initiative by the European Institute of Innovation and Technology's (EIT) Climate-KIC to develop a framework that defines essential innovation competencies and describes quality standards to develop and measure them respectively. This aims to create a pan-European standard for assessing innovation and entrepreneurship skills, with a focus on the climate change field[78].

FINCODA

At the core of this project is the development of the FINCODA Innovation Barometer Assessment Tool. This is a psychometric tool that measures individuals' capacity for innovation. It breaks innovation into five core areas and assesses the individual's capacity in each of these areas separately. The research underpinning this tool has been conducted by the FINCODA partners who as a whole bring together both the academic and industry innovation expertise from across Europe. The project will develop an online toolkit for behavioural assessment relating to innovation and a massive open online course (MOOC) related to behaviour assessment to disseminate the methods.

Source: FINCODA

---

78.   More generally, the OECD has started a strand of work to develop and refine our understanding of how creative and critical thinking skills can be developed and assessed in an educational setting. Currently focused on schools, the project *Assessing creative and critical thinking skills at school* (CREASSESS), will serve as inspiration for further work to explore how to promote creativity in higher education.

---

[77]   http://www.fincoda.eu/
[78]   http://www.certifiedprofessional.eu/

> **ASSESSING CREATIVE AND CRITICAL THINKING SKILLS AT SCHOOL (CREASSESS)**
>
> This OECD-led project aims to identify and test effective ways to help students develop their creativity and critical thinking by working directly with teachers and researchers. The work aims to identify good teaching practices and measure their effectiveness by testing students before and after the learning programmes in question. The aim is provide tools to support teacher training and professional development. Work to date has focused on schools, but an international seminar convening higher education stakeholders and experts in June 2016 concluded the approach should be expanded to examine approaches to stimulating students' creativity and critical thinking in higher education.

Source: OECD

5.2.2 Creating 'entrepreneurial universities'

79.   The concept of the 'entrepreneurial university' has been developed to describe HEIs that are making a conscious effort 'to empower students and staff to demonstrate enterprise, innovation and creativity' and that are dedicated to creating public value through processes of open engagement[79]. To assist universities to develop closer links between their education, research and engagement missions and to develop and strengthen partnerships with businesses, the European Commission and the OECD have developed and implemented the HEInnovate tool.

> **HEInnovate**
>
> HEInnovate is a self-assessment tool for HEIs wishing to develop their entrepreneurial and innovative capacity. It has been used so far by more than 800 HEIs worldwide and the goal is to have it used by 1400 HEIs by end of 2018. In addition to the self-assessment tool, the OECD is performing country-based reviews based on the HEInnovate methodology in EU Member States (five have taken place so far in Bulgaria, Poland, Hungary, the Netherlands and Ireland). In 2017-2018, five additional reviews will take place. The objective of the action is to consolidate the institutional evidence gathered through the reviews and to develop a systemic policy exploitation of the data and practices to support the implementation of strategies aiming at more entrepreneurial HEIs through the establishment of a Policy Learning Network.

Source: HEInnovate

80.   Public policy also has an important role to play in opening up universities to their "third mission" and in building synergies between research and education. In Sweden, for example, the higher education act of 1997 made interaction with surrounding society an official part of the mission of Swedish institutions for higher education (HEIs). In support of HEIs' efforts to adopt a more systematic approach to societal interaction and leverage collaboration with other actors to strengthen the quality of research and education, Swedish policy makers and agencies have been working to support efforts to develop universities'

---

[79]   https://heinnovate.eu/en

interaction with society. The 2016 Swedish research and innovation bill announced the addition of cooperation with surrounding society in addition to publications and external funding, as a quality indicator for incentivisation of HEIs.

5.2.3 Higher education and strengthening innovation capacity in weaker regions

81.   Knowledge intensive, innovative activities have a tendency to concentrate in 'core' areas rather than peripheral ones. The development of smart specialisation strategies in the regions as an ex-ante conditionality for ESIF investment in research represents an important step towards the implementation of spatially-targeted, contextually specific policies to promote knowledge-based growth in the European regions[80].

82.   In this context, higher education institutions have the opportunity to co-design and help implement smart specialisation strategies, bringing together education, research and innovation and helping to convene other regional actors in the innovation systems. The Higher Education for Smart Specialisation (HESS) project[81], led by the European Commission's Joint Research Centre aims to help build innovation capabilities by strengthening the role of HEIs in regional partnerships and to promote the integration of higher education in regional smart specialisation policy, particularly in the use of European Structural and Investment (ESI) Funds.

Higher Education for Smart Specialisation (HESS)

Starting in March 2016 for an initial twelve months, the HESS project focuses on how higher education and HEIs can contribute to the successful implementation of smart specialisation strategies. The main activity of HESS is 'action research' and capacity building in selected European regions. Two regions have been selected as pilots: Navarra in Spain, and North East Romania. In addition, the project will be monitoring the involvement of HEIs in implementation of smart specialisation strategies and spending on education by the ESI funds on a more global scale.

The project aims to understand and support HEIs to align their functions of human capital development with smart specialisation strategy priorities; analyse how public funds can allow HEIs to better contribute to implementation; foster change within HEIs to take on a strategic role in implementation and promote external cooperation between the HEIs and other actors in regional partnerships.

Source: Smart Specialisation Platform

---

[80]   http://s3platform.jrc.ec.europa.eu/.
[81]   http://s3platform.jrc.ec.europa.eu/hess

6 EFFECTIVE AND EFFICIENT HIGHER EDUCATION SYSTEMS

6.1 The quest for effectiveness and efficiency

83.   Higher education is being called on to do more: to improve performance in its core teaching and research missions; engage with society; and to develop newer roles, in areas like adult learning and innovation. This puts pressure on HEIs, their staff and those responsible for steering higher education systems to find and allocate resources effectively for different activities, and to demonstrate the money spent delivers good results.

84.   The pressure to demonstrate results has increased in an overall context where spending on higher education – as in other parts of the public sector - is under pressure. As shown in Figure 6.1, between 2008 and 2013, the OECD calculates that spending per higher education student fell in real terms in six EU Member States for which it has comparable data[82]. The European University Association's Public Funding Observatory[83] also pinpoints ongoing cuts in public spending per student in other countries including Greece and Latvia.

Figure 6.1: Changes in the number of students, expenditure on educational institutions and expenditure per student in tertiary education (2008, 2013)

Source: OECD (2016c). Table B1.5b. Index of change between 2008 and 2013 (2008 = 100, 2013 constant prices)

85.   These relative changes mask considerable underlying differences in the level of resources being invested per student. Figure 6.2 shows the public and private spending on higher education institutions per full-time equivalent student in euros adjusted by purchasing

---

[82]   Ireland, Denmark, Spain, Germany, Portugal and Belgium
[83]   http://www.eua.be/activities-services/projects/eua-online-tools/public-funding-observatory-tool.aspx

power standards (PPS). These data reflect the funds flowing into higher education institutions, but do not include public or private funds allocated directly to students, for example as student grants or public subsidy for student loan systems. When the differential cost of living in different Member States is taken into account in this way, the highest rates of spending per student is seen in Malta and Slovenia, followed by the UK, Sweden, Croatia and the Netherlands. The lowest rates of spending, as seen in Romania and Bulgaria, followed by Latvia, Lithuania and Poland.

Figure 6.2: Annual expenditure on educational institutions per tertiary education student (FTE), PPS, 2013
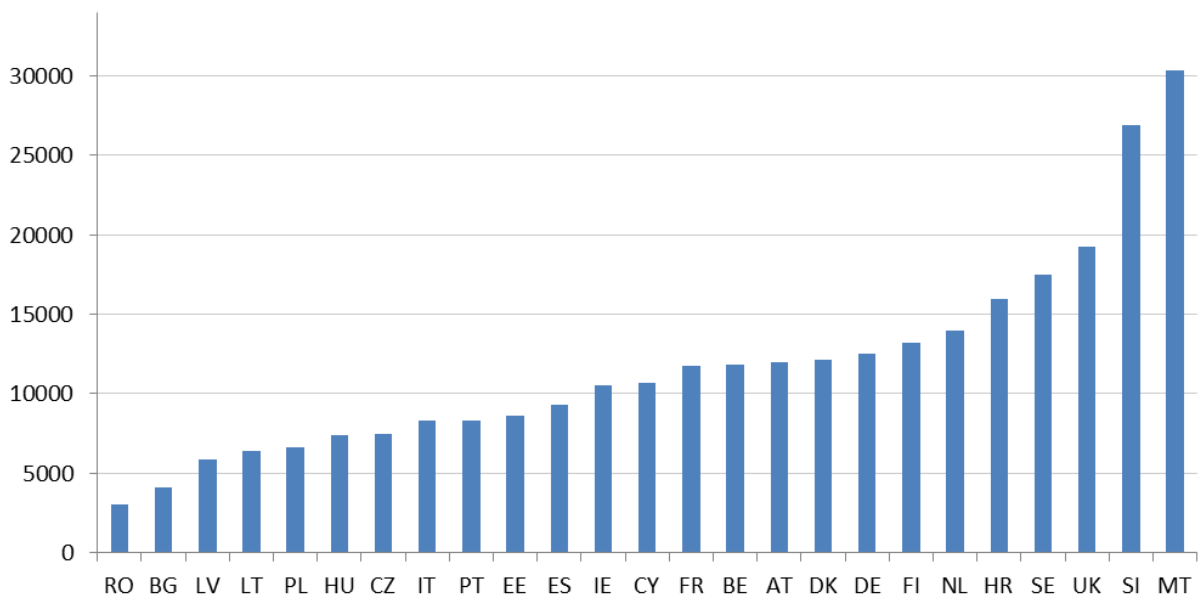
Source: Eurostat [educ_uoe_fini04] No data for EL, LU, SK

86.   Even in well-funded systems, finding appropriate indicators to measure performance and designing appropriate policy measures to improve performance levels has proved challenging. In most higher education systems, there has been an increasing focus on the quality of research outputs, where a range of bibliometric measures and peer review techniques are routinely implemented. However, governments and institutions have typically paid less attention to measures of the quality of education and outreach and engagement activities. This is one of the reasons for a widespread perception that these activities are comparatively neglected in national funding and quality systems and in institutional strategy setting[84].

6.2   Promising approaches

87.   Effective funding, quality and reward systems are important features of modern, effective higher education systems. Designing such systems is a shared challenge for all EU Member States, with the question of how best to incentivise and reward good teaching high

---

[84]   See Fung, D. et al (2017)

on the agenda in many countries. A number of initiatives in Member States in recent years may hold clues to how to develop better framework conditions for effective higher education.

6.2.1 Developing funding systems to reward performance

88.   In recent years, there has been a general shift towards systems that pay universities based on the outputs they produce (number of graduates, number of research publications etc), rather than purely on the basis of established costs. At the same time, a number of countries have introduced performance contracts between the state and higher education institutions which established specific targets, the achievement of which may be rewarded with funding. Output-based funding formulas and performance agreements with funding linked are types of 'performance-based funding' (PBF).

89.   The move to performance-based funding has generally been relatively recent and different models have been implemented in different EU countries. These reforms have now started to bed in and their impacts have started to be felt. A common trend has been to introduce specific contracts or performance agreements between the state and individual higher education institutions, which may or may not be linked to funding.

Institutional Performance Agreements in the EU

Three main models of performance agreement are used in the EU:

1. Institutional agreements are used as a basis for negotiation of the up-front allocation of a proportion of public funding, as in Austria. In this case, the performance agreements set out what the government agrees to pay for over a specific time period (eg 3 years in Austria) and cover the lion's share of public institutional funding. Performance in relation to targets is taken into account in future negotiation rounds, but fixed financial penalties for non-attainment of the targets are absent.
2. Agreements are used as part of a funding and performance system, where a proportion of public funding is allocated using output-based formula funding, as in Finland. Here, the agreements are not primarily a funding tool, but a strategic planning tool Targets for specific indicators (eg number of bachelor degrees completed) are set out in performance agreements, but the amount of money an institution receives is governed automatically through the standard formula system (which are distinct for universities or polytechnics) rather than through the performance agreement per se.
3. Explicit financial consequences are linked to both the conclusion of performance agreements and the attainment of objectives fixed in the agreements, as in the Netherlands and the Irish system. In the Netherlands, for example, institutions competed for 2% of the public higher education teaching budget that was awarded based on the quality of the development plans submitted by institutions, while an additional 5% of the teaching budget has been made conditional up-front on having a performance agreement and, for the next period on reaching quantitative targets, specific to each institution, related to teaching and agreed in the plans. If institutions do not achieve their quantitative target, they stand to lose part, or all, of their share of this 5% from 2016 onwards. In the Netherlands, the performance agreements are used alongside output-based funding formula.

6.2.2 Strengthening teaching and its links to research

90.   Although learning and teaching have always been at the core of university activities, the emergence of more competitive research funding and international university rankings based on research performance accentuated a widespread perception that teaching was (and is) a comparatively neglected activity in higher education. At the same time, as highlighted in section 3 of this paper, good teaching is crucial if students are to acquire the knowledge, skills and experience they need. It was against this backdrop that the EU's High-level Group on the modernisation of higher education examined the issue of promoting quality in teaching and learning in higher education institutions and produced it 2013 report[85].

91.   In their findings and recommendations, the High Level Group argue that ensuring quality in teaching and learning requires action by everyone involved in the higher education system at different levels: by governments and system regulators, by higher education institutions, by staff and by students. While the role of leaders of higher education institution is singled out as particularly crucial, the High Level Group also recommend that 'Public authorities responsible for higher education should ensure the existence of a sustainable, well-funded framework to support higher education institutions' efforts to improve the quality of teaching and learning'. The Group also argues that teaching performance should be a factor in recruitment and progression decisions in higher education, which are in many countries affected by system-wide regulations and conventions[86].

---

[85]   High Level Group on the Modernisation of Higher Education (2013)
[86]   For an overview of the level of autonomy European higher education institutions have over staffing matters, see EUA (2016a) University Autonomy in Europe

> **System-level approaches to promoting quality in teaching**
>
> Along with higher education institutions, a number of governments in Europe are placing increased emphasis on promoting quality and innovation in teaching in higher education. System-level approaches to supporting teaching take various forms. For example:
>
> - In **Ireland**, the National Forum for the Enhancement of Teaching and Learning was established in 2012 to work structurally on improving teaching and learning. The National Forum uses different instruments to do this, including academic professional development tools and awards, a national digital platform and e-learning capacity development, and grants and fellowships.
> - In the **French-speaking Community of Belgium**, specific legislative provisions target teaching excellence. According to the Bologna Act (2004), university institutions should use at least 10 % of their basic public funding for teaching excellence for success and were required to jointly set up 'higher education teaching centres'.
> - In **Norway**, the Ministry of Education and Research funds 'Centres for Excellence in Education' (SFU in Norwegian). SFU status is awarded to academic communities that have already demonstrated excellent quality and innovative practices in education and that have plans in place for further development and innovation. One of the important requirements the centres have to meet is that they must disseminate their results and knowledge.

92.   The question of rewarding quality and creating parity of esteem between teaching and research activities in higher education is also intrinsically bound up with the question of how teaching and research should be inter-related. As highlighted in a recent report by the League of European Research Universities (LERU)[87], there are concerns that teaching and research too often operate in parallel worlds that rarely meet, including in research-intensive universities. To address this, higher education institutions and government agencies involved in funding research and higher education are increasingly exploring ways to strengthen the link, with more research-based teaching and greater involvement of students in research.

---

[87]   Fung, D. et al (2017)

93.

7 CROSS-CUTTING ASPECTS OF EU SUPPORT

7.1 EU knowledge tools in higher education: U-multirank and ETER

94. Transparency tools are needed to benchmark HEI performance for institutional strategy setting and to communicate information on higher education institutions to students choosing between specific educational programmes, to public or private agencies awarding research contracts, to governments deciding on accountability issues relating to funding and for regional and international engagement of higher education institutions. From this perspective, the European Commission has supported the development of U-Multirank, an independent multi-dimensional international ranking system and a European Tertiary Education Register (ETER).

95. U-Multirank[88] is a multidimensional, user-driven approach to international ranking of higher education institutions. It compares the performances of higher education institutions in the five broad dimensions of university activity: (1) teaching and learning, (2) research, (3) knowledge transfer, (4) international orientation and (5) regional engagement. The U-Multirank web tool enables comparisons at the level of the university as a whole and at the level of specific fields of study. Based on empirical data U-Multirank compares institutions with similar institutional profiles ('like-with-like') and allows users to develop their own personalised rankings by selecting indicators in terms of their own preferences.

96. The European Tertiary Education Register (ETER)[89] is a database of higher education institutions in Europe providing data on the number of students, graduates, international doctorates, staff, and fields of education, income and expenditure as well as descriptive information on the characteristics of the institutions. The collection of data is done in partnership with National Statistical Authorities, but publication of the data is done independently.

97. The tools were developed organically and independently over time. As further development, these tools will be components of a 'Knowledge Hub for Higher Education' to create synergies across the knowledge tools and other higher education research projects piloted by DG EAC. The Knowledge Hub, to involve the Joint Research Centre, will gather the knowledge tools to optimise management and funding mechanisms, to ensure optimal synergies and interoperability between the tools, to minimise overlaps in data collection, to improve communication of results at European and national level, and to support better policy-making based on the data collection and evidence behind the tools.

---

[88] http://www.umultirank.org/
[89] https://www.eter-project.com/

7.2 Overview of actions included in the renewed EU agenda for higher education

98.   The table below provides an overview of the EU-level actions included in the renewed EU agenda for higher education.

Figure 7.1 Overview of EU-level actions

Action	New / expanded self-standing initiative	New / increased priority in programme calls	Timing
PRIORITY 1: SKILLS			
1. European initiative to track graduates	**X** **Announced in Skills Agenda**		Proposal for Council Recommendation: 05/17 EU tracking study: 24 months from 09/17 (09/19) EU network: ongoing from 09/17
2. EU STE(A)M coalition	**X**		Quarter 3 2017 onwards
3. Erasmus+ business consortia + Erasmus+ work placements with digital focus	**X**	**X**	Quarter 1 2018 (Erasmus+ 2018 calls) (Horizon 2020 2018)
4. Digital Readiness Model + guidance on Open Education Initiatives	**X**		Quarter 4 2017
5. Strategic Erasmus+ support for higher education teachers, post-graduate and post-doctoral graduates	**X**	**X**	Quarter 1 2018 (Erasmus+ 2018 calls)
PRIORITY 2: SOCIAL DIMENSION			
6. Support for integrated institutional strategies for inclusion, gender equality and study success	**X**	**X**	Peer learning: quarter 4 2017 Erasmus+ support: Quarter 1 2018 on (Erasmus+ 2018 calls)
7. Development and testing of flexible and modular course design		**X**	Quarter 1 2018 (Erasmus+ 2018 calls)
8. Raise awareness of benefits of ECTS points for voluntary and community activities	**X**		Peer-learning: Quarter 4 2017 Self-assessment tool: Quarter 3 2017 Erasmus+ app: Quarter 2 2017
9. Academic recognition for	**X**		Quarter 3 2017

Action	New / expanded self-standing initiative	New / increased priority in programme calls	Timing
refugees			
PRIORITY 3: INNOVATION & REGIONAL ENGAGEMENT			
10. Expand EIT Regional Innovation Scheme (EIT-RIS)	X	X	Quarter 4 2017
11. Teaching methods for creativity and innovation competencies (OECD)	X		Start Quarter 3 2017 (2 year project)
12. Higher Education for Smart Specialisation (HESS)	X *(Follow-up to COM(2016) 941 final)*		Project underway Next phases will start in quarter 3 2017
13. Widening participation in Marie Skłodowska-Curie actions		X	Any activities would be part of 2018-20 Horizon 2020 Work Programme (expected adoption October 2017).
14. University-business fora	X		Quarter 4 2017
PRIORITY 4: SYSTEMS			
15. Review of funding, incentive and reward structures and peer counselling on system-level funding and steering	X *(Follow-up to COM(2016) 941 final)*		From Quarter 1 2018 onwards (Initial planning = two-year project 2018-2019)
16. More emphasis on teaching in MSCA		X	To be written in Horizon 2020 Work Programme 2018-20, published October 2017
HORIZONTAL ACTIONS			
17. Knowledge Hub on higher education	X		Quarter 2 2017
18. Strengthen Eurydice and cooperation with OECD	X		Ongoing from quarter 2 2017
19. Electronic student identification	X		Quarter 2 2017 onwards
20. Discussion on future EU support to HE	X		Quarter 3 2017

43

REFERENCES

Arntz, M., T. Gregory and U. Zierahn (2016), The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis, OECD Social, Employment and Migration Working Papers, No. 189, OECD Publishing, Paris. http://dx.doi.org/10.1787/5jlz9h56dvq7-en

BiGGAR Economics (2015) Economic Contribution of the LERU Universities http://www.leru.org/files/publications/LERU_Economic_Contribution_-_Report.pdf

Campus Responsables (2016) Étude d'impact socio-économique et environnemental des campus français http://www.campusresponsables.com/contenu-15007/decouvrez-letude-campus-footprint.html

Cavallini, S., R. Soldi, J. Friedl, M. Volpe (2016) Using the Quadruple Helix Approach to Accelerate the Transfer of Research and Innovation Results to Regional Growth, Committee of the Regions 2016 http://cor.europa.eu/en/documentation/studies/Documents/quadruple-helix.pdf

CEDEFOP (2015a) Skills, qualifications and jobs in the EU: the making of a perfect match? Evidence from CEDEFOP's European skills and jobs survey, Luxembourg: Publications Office. CEDEFOP reference series; No 103. http://dx.doi.org/10.2801/606129

CEDEFOP (2015b) Stronger VET for better lives. CEDEFOP's monitoring report on vocational education and training policies 2010-14. Luxembourg: Publications Office. CEDEFOP reference series; No 98 http://www.cedefop.europa.eu/en/publications-and-resources/publications/3067

CEDEFOP (2016a). Future skill needs in Europe: critical labour force trends, Luxembourg: Publications Office. CEDEFOP research paper; No 59. http://dx.doi.org/10.2801/56396

CEDEFOP (2016b) Briefing Note: Skill shortage and surplus occupations in Europe http://www.cedefop.europa.eu/en/publications-and-resources/publications/9115

Davies, S., J. Mullan, P. Feldman (2017) Rebooting learning for the digital age: What next for technology enhanced higher education? Higher Education Policy Institute, UK. http://www.hepi.ac.uk/2017/02/02/rebooting-learning-digital-age-next-technology-enhanced-higher-education/

Eurobarometer (2010) Employers' perception of graduate employability: Analytical report http://ec.europa.eu/public_opinion/flash/fl_304_en.pdf

EUROGRADUATE Consortium (2016) Testing the Feasibility of a European Graduate Study: Final report of the EUROGRADUATE feasibility study http://www.eurograduate.eu/results/reports

European Commission (2016a) Staff Working Document SWD (2016) 195 final, Annex II - Results of the public consultation on the EU's modernisation agenda for higher education, 10.06.2016 http://ec.europa.eu/social/main.jsp?catId=1223&langId=en&moreDocuments=yes

European Commission (2016b) Science, Research and Innovation performance of the EU http://bookshop.europa.eu/is-bin/INTERSHOP.enfinity/WFS/EU-Bookshop-Site/en_GB/-/EUR/ViewPublication-Start?PublicationKey=KI0415512

European Commission (2016c) Regional Innovation Scoreboard 2016 http://ec.europa.eu/growth/industry/innovation/facts-figures/regional_en

European Research Centre for Anti-Corruption and State-Building, Hertie School of

Governance (2015) PUBLIC INTEGRITY AND TRUST IN EUROPE, Berlin 2015 http://www.eupan.eu/en/documents/show/&tid=1014

European Political Strategy Centre - EPSC (2016) Opportunity Now: Europe's Mission to Innovate, EPSC Strategic Notes, Issue 15, 5 July 2016 https://ec.europa.eu/epsc/sites/epsc/files/strategic_note_issue_15.pdf

European University Association (2016a) University Autonomy in Europe http://www.university-autonomy.eu/dimensions/staffing/

European University Association (2016b) Public Funding Observatory http://www.eua.be/activities-services/projects/eua-online-tools/public-funding-observatory-tool.aspx

Eurostudent (2015) EUROSTUDENT V 2012–2015: Synopsis of Indicators http://www.eurostudent.eu/download_files/documents/EVSynopsisofIndicators.pdf

Eurydice (2014) Modernisation of Higher Education in Europe: Access, Retention and Employability http://eacea.ec.europa.eu/education/Eurydice/thematic_reports_en.php

Flisi et al. (2016). Measuring Occupational Mismatch: Overeducation and Overskill in Europe — Evidence from PIAAC https://link.springer.com/article/10.1007/s11205-016-1292-7

Fung, D. et al (2017) Excellent education in research-intensive universities http://www.leru.org/files/publications/LERU_Position_Paper_Excellent_Education.pdf

Goddard, J. (2011) The Civic University: Re-uniting the University and the City, paper for conference Higher Education in Cities and Regions For Stronger, Cleaner and Fairer Regions, 10-11 February 2011, Seville

http://www.eua.be/Libraries/sirus-conference/John_Goddard_Paper_for_Seville.pdf?sfvrsn=0

Goddard, J. (2014) What do we mean by the 'civic university'? Presentation at Universities for Europe workshop, European Economic and Social Committee, 13 June 2014 http://www.eesc.europa.eu/?i=portal.en.events-and-activities-universities-for-europe-presentations.32448

Identifying, enhancing and promoting their role in city and regional development

Heywood, J; et al (2015) The Changing Pedagogical landscape: New ways of teaching and learning and their implications for higher education policy; https://bookshop.europa.eu/en/the-changing-pedagogical-landscape-pbNC0415435/;pgid=GSPefJMEtXBSR0dT6jbGakZD0000WlO22596;sid=XIxccNv6PA1ceIM4mELC17nfEe9CAnk5INw=

Higher Education Authority (2015) Graduate Surveys: Review of International Practice http://www.hea.ie/node/1618

High Level Group on the Modernisation of Higher Education (2013) Report to the European Commission on improving the quality of teaching and learning in Europe's higher education institutions ec.europa.eu/dgs/education_culture/repository/education/.../modernisation_en.pdf

High Level Group on the Modernisation of Higher Education (2014) Report to the European Commission on New modes of learning and teaching in higher education http://ec.europa.eu/education/library/reports/modernisation-universities_en.pdf

Frey, C.B and M.A. Osborne (2013) The future of employment: how susceptible are jobs to computerisation? 17 September, 2013 www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf

Joint Research Centre (2014) Universities and Smart Specialisation, JRC Technical Report No. 03/2013
http://s3platform.jrc.ec.europa.eu/documents/20182/115084/JRC85508_Universities_and_S3.pdf/23a84c8b-233f-4cee-aae9-c89914f23e9c

Joint Research Centre (2015a) OpenCases: case studies on openness in higher education
http://is.jrc.ec.europa.eu/pages/EAP/opencases.html

Joint Research Centre (2015b) Skills beyond education: an analysis of cognitive skill evolution and its implications for employment chances
http://bit.ly/2pvM7NT

Joint Research Centre (2016a) How are Higher Education Institutions Dealing with Openness? A Survey of Practices, Beliefs, and Strategies in Five European Countries
http://bit.ly/2pvObWp

Joint Research Centre (2016b) Opening up Education: A Support Framework for Higher Education Institutions
http://bit.ly/2pGZDis

Joint Research Centre (2016c) MOOCs in Europe: Evidence from pilot surveys with Universities and MOOC learners
https://ec.europa.eu/jrc/sites/jrcsh/files/JRC%20brief%20MOOCs_JRC101956.pdf

McKinsey Center for Government (2014) Education to Employment: Getting Europe's Youth into Work
http://www.mckinsey.com/industries/social-sector/our-insights/converting-education-to-employment-in-europe

OECD (2012) Fostering Quality Teaching in Higher Education: Policies and Practices
https://www.oecd.org/edu/imhe/QT%20policies%20and%20practices.pdf

OECD (2013) OECD Skills Outlook 2013: First Results from the Survey of Adult Skills,

OECD Publishing, Paris
http://dx.doi.org/10.1787/9789264204256-en

OECD (2016a) OECD Employment Outlook 2016
http://www.oecd.org/els/oecd-employment-outlook-19991266.htm

OECD (2016b) Fostering and assessing students' creativity and critical thinking in higher education: Workshop Summary Report 20-21 June 2016
http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/CERI/CD(2016)8&docLanguage=En

OECD (2016c) Education at a Glance 2016: OECD Indicators, OECD Publishing, Paris.
http://dx.doi.org/10.187/eag-2016-en

Smart Specialisation Platform (2011) Connecting Universities to Regional Growth: A Practical Guide
http://ec.europa.eu/regional_policy/en/information/publications/guides/2011/connecting-universities-to-regional-growth-a-practical-guide

Sursock, A. (2015) Trends 2015: Learning and Teaching in European Universities
http://www.eua.be/Libraries/publications-homepage-list/EUA_Trends_2015_web.pdf?sfvrsn=18

Universities UK (2011) Efficiency and effectiveness in higher education: A report by the Universities UK Efficiency and Modernisation Task Group
http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Pages/report-by-efficiency-and-modernisation-task-group.aspx

Universities UK (2015a) Efficiency, effectiveness and value for money
http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Pages/efficiency-effectiveness-and-value-for-money.aspx

Universities UK (2015b) The economic role of universities

http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Pages/the-economic-role-of-universities.aspx

Vincent-Lancrin, S (2016) Open Higher Education: What are we talking about? Background paper for international seminar Opening Higher Education: what the future might bring, Berlin, 8-9 December 2016

Wernli, D. et al. (2016) Interdisciplinarity and the 21st century research-intensive university, LERU, November 2016 http://www.leru.org/index.php/public/news/interdisciplinarity-how-universities-unlock-its-power-to-innovate/

World Economic Forum (2016) The Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution, January 2016 https://www.weforum.org/reports/the-future-of-jobs