



*European Economic and Social Committee*

**SOC/576**

**Supportive education systems to avoid skills mismatches**

## **OPINION**

European Economic and Social Committee

**Supportive education systems to avoid skills mismatches – what transition is needed?**

[own-initiative opinion]

Rapporteur: **Milena ANGELOVA**

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## 1. Conclusions and recommendations

- 1.1 The EESC appreciates the increased focus on education, training and skills development and utilisation in the EU, reiterated in the recent European Commission (EC) initiatives<sup>i</sup>. While noting that education and training lies within Member States' (MS) core competences, stresses the strategic importance of these areas for the future of Europe in terms of economic prosperity, better cohesion and democratic life, as well as "to address citizens' expectations and respond to their concerns about the future in a quickly changing world"<sup>iii</sup>.
- 1.2 The EESC is concerned about the significant structural problems in labour markets due to skills mismatches, some of which are caused by technological and demographic drivers. Therefore calls for immediate well-targeted policy measures to be designed and implemented, accompanied by incentives and best practice compendiums for the MS, so as to support them in implementing the successful and supportive adaptation, where needed, of their education and training systems, with a view to avoiding skills mismatches and waste of talents.
- 1.3 The EESC believes that the skills mismatches of today and in the future could be properly addressed in a sustainable way only if the EC and the MS design targeted policies and take tangible measures in order to improve and appropriately adapt their education and training systems, in commitment to talent management and also to holistic skills governance systems. Therefore, invites them to do so in a prompt and efficient manner. These should all be geared to supporting the inclusive and continuous updating of the labour force to the new economic environment.
- 1.4 The EESC asks the EC to intensify the spread of best practices on qualification programmes and VET. The right mix of incentives for all participants in the education and training process should also be provided as to safeguard the right to appropriate training for all<sup>iii</sup>. In line with its previous opinion, the EESC stresses the importance of a European Education Area<sup>iv</sup>. The EESC sees a need for further upgrading and a need to constantly improve the skills and competences of teachers and trainers at all levels of education and training.
- 1.5 The EESC admits that some elements of skills mismatch will always persist and education systems can never prepare people perfectly for all circumstances. Still, current trends are worrying and creating bottlenecks for the economic growth and job creation, preventing citizens from fully unleashing their creative potential and businesses from benefiting from the full innovative capacity of the skills offered by human resources. This is why governments, social partners, civil society should join forces to overcome the problem and provide people with the necessary advice and guidance to help make the right choices and to develop constantly their knowledge and skills for the good of society. Comprehensive and holistic approaches are needed to better anticipate and respond to skills needs<sup>v</sup>.
- 1.6 Inevitably reliable anticipation of the supply and demand of skills and of the future structure of the EU labour market are key to decreasing skills mismatches. For this reason, universities, scientific centres and other research institutions should start to work on this issue, in close cooperation with the social partners and the relevant administrative bodies in the MS. The

experience accumulated in recent years by CEDEFOP will be very useful but it has to be developed further on a national basis by going into more details for each of the MS.

- 1.7 Governments, enterprises and workers should see education and training as an investment. Tax incentives for such an investment could encourage employers and employees to invest more. Collective agreements may recognise certain rights and obligations of employers and employees related to education and training. Best practices for upskilling and reskilling should be promoted in order to help people to be reemployed.
- 1.8 Lots of learning happens in non-formal and informal settings, such as in youth organisations and through peer-to-peer learning, and lots of workplace skills cannot be acquired through formal education in schools<sup>vi</sup>. Therefore, the EESC encourages MS to seek the ways to validate the relevant qualifications acquired in such situations. A way to do this is to complete and properly use their National Systems of Qualifications, including by using platforms which offer standardised assessments of skill levels irrespective of how people have acquired their skills. Such an approach will create an additional channel for signalling individuals' potential to companies, especially with regard to mature individuals, highlighting skills that are not evident in formal qualification documents, but nevertheless may have value.
- 1.9 Lifelong learning, upskilling and reskilling are a shared responsibility, between the state, employers and employees. In order to be able to make a good career path, people should be actively supported, and advised, also through guidance methods, consultancy, counselling, coaching and mentoring on how to make an informed choice of training and learning that equips them with skills and competences which are in demand on the labour market. The social partners should have active role, raising awareness of the relevant problems and suggesting possible solutions. Before committing their time and funds to training, people need to know which skills are useful and how education and training programs will affect their careers. They also will be willing to obtain a qualification or certification that others will recognise.

## 2. **Today's and tomorrow's skills mismatches**

- 2.1 The future is today – it becomes reality faster than we can track and predict it. It poses important challenges for businesses and public administrations by establishing new business models and for workers by requiring new skills and competences, most of which are hard to predict today, thus driving society as a whole to adapt fast enough to rapid change. If we want this transition to be successful, we must remain united, prepared for immediate reaction, join forces to anticipate what is coming and pro-actively manage the current revolutionary change of the relations between human, robotics, artificial intelligence and digitalisation for the good of our society.
- 2.2 Skills mismatches are one of the biggest challenges that currently jeopardise growth and impede sustainable jobs in EU. Some studies<sup>vii</sup> estimate that the costs of this phenomenon amount to 2% of EU GDP. According to the EC, 70 million Europeans lack adequate reading and writing skills, and even more have poor numeracy and digital skills. A recent study<sup>viii</sup> shows that the share of mismatched workers in the EU, on average, remains around 40%, in line with CEDEFOP's overall assessment. Employees with relevant skills are a key competitiveness

factor for companies. Thus it is extremely important that today's and tomorrow's labour force has the skills and competences that respond to the changing needs of the modern economy and the labour market. No one should be left behind<sup>ix</sup> and waste of talents should be prevented. To achieve these goals highly qualified teachers and training providers are needed, and appropriate support to participate in the life-long learning.

- 2.3 The EESC has underlined in its previous opinions<sup>x</sup> the effect of the digitalisation, robotisation, new economic models such as Industry 4.0 and the circular and sharing economy on new skill requirements. Also, it has expressed its views on the need to introduce more innovative solutions in the fields of education and skills development, as Europe needs a genuine paradigm shift in the goals and functioning of the education sector and an understanding of its place and role in society<sup>xi</sup>. A CEDEFOP estimate<sup>xii</sup> has shown that the existing skills of the EU workforce fall about one fifth short of what is needed for workers to carry out their jobs at their highest productivity level. This calls for concerted action to stimulate further adult learning in Europe.
- 2.4 The European economy's recovery, in combination with changing skills needs, has driven demand for labour and talent shortages to the highest levels in the past decade. While the unemployment rate in the EU is decreasing (from 10.11% in 2014 to 7.3% in 2018), the job vacancy rate has doubled (from 1.1% in 2009 to 2.2% in 2018)<sup>xiii</sup>.
- 2.4.1 All MS are exposed to this problem although with different intensity and for different reasons. A global survey<sup>xiv</sup> reveals that for many MS the rate of employers having difficulties with hiring is worryingly high. Ten MS are above the global average of 45% with the most unfavourable cases being Romania (81%), Bulgaria (68%) and Greece (61%). With less but still significant problems at the other end of the spectrum are Ireland (18%), UK (19%) and the Netherlands (24%).
- 2.4.2 For about one-third of employers the main reason they can't fill job vacancies is a lack of applicants. Another 20% say candidates lack the necessary experience. As companies digitalise, automate and transform, finding candidates with the right blend of technical and soft skills is more important than ever – yet 27% of employers say applicants lack the skills that they need. Globally, more than half (56%) of employers say communication skills, written and verbal, are their most valued human skills followed by collaboration and problem-solving.
- 2.5 The results from both the Program for the International Assessment of Adult Competencies (PIAAC) and the European Skills and Jobs Survey (ESJS), as well as from academic research<sup>xv</sup>, show that a large part of the mismatch is due to over-skilling/education. Typically four in ten adult employees feel that their skills are underutilised and close to a third of tertiary education graduates are overqualified for their jobs. This is a consequence of both ineffective resource allocation (leading to underutilisation of the existing stock of skills) and general imbalances between the skills of the workforce and labour market demand<sup>xvi</sup>.
- 2.6 Skills mismatches have negative effect on economies and the whole society. They:
- Prevent citizens from being satisfied with their occupations and career paths, lower their perceived level of appreciation and have potential to drag down their wages;

- Impede personal growth and development and utilisation of individuals' capacity and potential;
  - Result in lower labour productivity – some estimates show that the loss of productivity<sup>xvii</sup> due to skills mismatches in the EU is around EUR 0.8 for every hour worked<sup>xviii</sup>;
  - Decrease the competitiveness of companies by slowing and making more expensive the process of hiring and by imposing the need for additional expenditure on training.
- 2.7 Both high-skilled and low-skilled labour are exposed to skills mismatches, because of the rapid changes, as well as professions typically requiring high levels of education and knowledge. Electricians, mechanics, welders, engineers, drivers, IT specialists, social services specialists, sales representatives are currently among the professions in highest demand with employers.
- 2.8 STEM skills and digital skills are increasingly crucial for the competitiveness of companies and for harnessing worker productivity. The importance of STEM skills also goes beyond the content of science, technology, engineering and mathematics curricula alone and enable pupils and students to acquire a broader range of skills and competences, such as systemic and critical thinking. Underpinning these skills sets, it is also essential that people have a good foundation of basic and entrepreneurial skills. STEM skills can be acquired through vocational education and training and general education. There is a particular need to encourage more women to study STEM subjects, together with adequately addressing the digital gender divide<sup>xix</sup>. Different ways should be found to popularise STEM, particularly with regard to the regions, since these subjects are usually concentrated in big cities<sup>xx</sup>. The digital strategic competences radar is a useful tool to bring youngsters together with role models or mentors in order to learn about required competences for specific jobs<sup>xxi</sup>.
- 2.9 Well-designed policy measures are needed to avoid the problem of skills mismatches growing further. Due to the revolutionary change in technologies, business models, customer expectations and the nature of work are often changed in an unprecedented and almost unpredictable manner. As the EESC has already pointed out<sup>xxii</sup>, almost half of existing jobs are susceptible to automation and therefore automation and robots will have significant impact on the future of work. This may result in a growing gap between the needs of the businesses and the qualifications, skills and competences of workers in the future and presents a challenge for education and training providers. This also underlines the growing importance of soft and transversal, as well as other skills, often gained through informal learning, and raises issues linked to recognition and validation of the informal education and training.
- 2.10 The EU should encourage and help MS to urgently address this structural labour market challenge and to tackle skills mismatches which create bottlenecks to growth, with particular focus on STEM and digital skills. Social partners have an important role to play in identifying and, where possible, forecasting the skills, competences and qualifications that are necessary in new and emerging occupations<sup>xxiii</sup>, so that education and training better address the needs of companies and workers. Digitisation is an opportunity for all, but only if it is done right and a new understanding of work and labour is gained<sup>xxiv</sup>. It is also important that social partners are involved in interpreting data that is gathered by statistical and government agencies as employers and trade unions can bring crucial insights that might not otherwise be taken into

consideration. The European Social Fund (ESF) has an indispensable role to play to support initiatives, including by joint actions of the social partners.

- 2.11 Academic research on skill mismatch has revealed that there are significant differences in the causes, magnitudes, consequences and economic costs of the many different types of skill mismatch. Therefore one-size-fits-all policies are unlikely to be effective as MS tend to suffer from different forms of the problem. But it is clear that carrying out relevant policy measures aiming at reducing skill mismatch can result in sizeable efficiency gains. To that end, the EESC stresses the importance of holistic learning that respects and enriches cultural diversity and the sense of belonging<sup>xxv</sup>.
- 2.12 The European skills passport can play an important role in presenting a person's qualifications, skills and competences in a way that will facilitate a better matching of a person's abilities with a job profile.

### 3. **Challenges facing education and training systems**

#### 3.1 General remarks

- 3.1.1 If the EU wants to give its citizens the best chance of success and to preserve and improve its competitiveness, it needs to encourage MS to foster a policy environment that offers career-focused initial education and training and which continues to provide opportunities for life-long learning throughout people's working lives.
- 3.1.2 The education and training systems in many MS are focused on a long period of formal learning followed by a career at work. The link between learning and earning has tended to follow a simple relationship: "the more formal learning - the higher the corresponding rewards". Economic studies suggest that each additional year of schooling is associated on average with 8-13% more earnings. It is equally true that a university degree can no-longer be seen as a guarantee of work upon graduating. Employers today not only look at the level of qualification that a person holds, but also the skills and competences that someone has acquired during their education and the extent to which these are relevant on the labour market. But given the new challenges this can't be an advisable model any more. Future education systems should connect education and employment in new ways both by smoothing entry into the labour force and by enabling people to acquire new skills throughout their entire careers in a flexible way.
- 3.1.3 Pleading for just more education and training is not the proper answer – more doesn't necessarily mean better. In order to respond properly, education and training systems must be targeted at the real needs of the society and the economy, have to be able to avoid misallocation of resources and able to provide people with the possibility for targeted lifelong learning. In order to promote equal and inclusive employment, the gender pay gap needs to be tackled through relevant measures.
- 3.1.4 The internet has done away with the need to know and remember important facts and details – it provides an instant portal to knowledge with just one click. This is changing the fundamental principles of the humanitarian sciences, removing the need for students to store all the

information in their heads, and replacing it with the need to teach them how to learn and to equip themselves with a basic, conceptual image of the subjects concerned, so that they are then able to find and process information in order to successfully perform a given task, or find a solution to a given problem.

- 3.1.5 The technological changes are so rapid that they are making the content of some disciplines outdated, even during the course of student's higher education cycle. This is challenging the traditional curricula, especially when it comes to the so called "basic" part, and is increasing the importance of STEM education and the development of soft skills such as critical thinking, problem solving, co-learning and co-working. It is likewise important that the challenge of interaction between humans and machines be addressed as well.
- 3.1.6 The development of new technologies also seriously challenges the practical component of education and training because it takes a long time in most MS for programmes to be developed and officially approved, which makes them inflexible and hampers their swift accommodation to developments in real life. To tackle this a stronger link between all levels of education and the labour market needs is necessary. Updating curricula in a timely manner becomes a key challenge and this highlights the role of responsive vocational education and training, and apprenticeships.
- 3.1.7 It is essential in any job that people have some technical and specific skills based on knowledge and experience for the particular industry. But it becomes more and more important that they have also foundational skills like creativity and problem-solving, as well as social skills and empathy.
- 3.1.8 The growing pace with which established skills become obsolete makes it essential to acquire new skills faster and results in growing demand for a new combination of skills – in response to the so called "hybrid jobs" that combine different types of tasks. For example, coding skills are now demanded in many areas beyond the technological sector and evidences show that between 1/3 and 1/2 of the postings for occupations with the highest pay are for jobs asking for coding skills.
- 3.1.9 The recent rapid changes in the composition of new jobs requires increasing emphasis on learning as a skill in its own right. The best way to meet the challenge of unpredictably changing technology and hybridizing jobs is the ability to rapidly acquire new skills and to keep learning. This aspect should be managed with due care so as to ensure that disadvantaged groups, such as the long-term unemployed, the very low skilled, the disabled and minorities do not become distanced from the labour market. In this respect it is important to strengthen the cooperation between social partners and providers of active labour market policies.
- 3.1.10 In order for the above goal to be achieved it is important that MS find ways to motivate young people not to leave school at early stages, since early school leavers are usually among those people with low skills and low payment. Mothers with young children need special attention in terms of training as well in order to keep their skills up-to-date with the rapid changes in professions.

3.1.11 The EESC strongly recommends wider promotion and use of modular and online learning – e.g. open educational sources and massive open online courses (MOOCs)<sup>xxvi</sup>.

## 3.2 Secondary education

3.2.1 To be able to equip students with the fundamental skills for the future – e.g. curiosity, searching for reliable information, an ability for continuous learning, creativity, problem-solving, team work – secondary education has to shift from requiring only memorisation and repetition to a project-based and problem-solving approach.

3.2.2 Dual VET, in which learners spend part of their time in the classroom and part in an enterprise, especially apprenticeship, is a powerful tool to give students job-specific and transversal (soft) skills and in fostering successful school to work transitions. Therefore its use should be more actively promoted in the MS, following the best practices of front-runners, where between one third and one half of the secondary school population follows this kind of education. Traineeships also play an important role in helping young people to acquire practical work experience. Traineeships primarily take place as part of the education and training process. They can also be open market traineeships that take place after a person has finished their education or training. The rules governing a traineeship, and the conditions under which it takes place are determined at the national level and take into account existing regulations, industrial relations and education practices. These rules could take inspiration from the Council Recommendation on a quality framework for traineeships<sup>xxvii</sup>.

3.2.3 However, dual VET should be adapted for new realities as well as through the timely updating of curricula, by creating a supportive learning environment where skills can be developed and upgraded throughout a career life-cycle.

3.2.4 The teachers' capacity and competences are key to a high-quality dual VET, and of vital importance to the combination of practical experience and theoretical experience. It is therefore important that MS maintain a system for continuous training of teachers and trainers, and together with social partners, endeavour to find ways to motivate them.

## 3.3 University education

3.3.1 The EESC sees the main challenge regarding university education in many MS as the need to strengthen work-based training components of curricula, in order to teach students the transversal and subject-specific practical skills that employers are looking for. Consequently, there is a need to better involve social partners in the design and delivery of education and training.

3.3.2 It must be always borne in mind that university education is not a goal per se. All jobs are important, since all professions and occupations allow people to contribute to the economic and social development of a society and university education should remain an option, but not an obligation or a stamp indicating the quality of the people.

- 3.3.3 A university degree at the start of a working career does not mean that there is no need for the continuous acquisition of new skills, especially as career spans tend to lengthen. Universities should acknowledge a new social goal of providing lifelong education using flexible forms of learning (distance learning, evening classes etc.) and should adjust their structures and plans accordingly.
- 3.3.4 Social skills have growing importance for a wide range of jobs, because of their role in relationships in the working place, in dividing and leading tasks, and in creating and maintaining an efficient and productive environment. For this reason, it would be advisable for universities to complement their traditional curricula in specialised fields with additional classes in management, communications, etc. Besides, the universities have to "break the wall" between educational fields and have to emphasise interdisciplinary approaches. The future of work for highly educated professions will inevitably be related to the need for interdisciplinary skills.
- 3.3.5 Information about effective learning strategies can be personalised too. It is easier for people to be encouraged to learn more effectively and with better results if they are more aware of their own thought processes. With the recent rise of online learning, the mechanics of learning have become better known and could give a better idea of the best ways of learning on an individual basis. If such approaches are applied it is more likely that students will be able to acquire new skills later in life and also personalised content could be provided for students in distant learning formats.
- 3.3.6 Given the high costs of higher education and the available evidence that there is a lot of inefficient resource allocation in this area, MS should be encouraged to introduce tracking systems which could provide information for the actual situation of the labour market, as per the Council Recommendation on graduate tracking<sup>xxviii</sup>.

#### 3.4 The VET system

- 3.4.1 The EESC welcomed the aim that is presented in the European Framework for Quality and Effective Apprenticeships that at least half of an apprenticeship should be carried out in the workplace. Taking into account the diversity of national schemes, the aim is to progress gradually towards the majority of apprenticeships being undertaken in the workplace<sup>xxix</sup>.
- 3.4.2 The EESC welcomes the EC objective of making VET a first class option for learners. It underlines the importance of fostering permeability between VET and higher education in order to open up opportunities and help remove stigma surrounding VET<sup>xxx</sup>.
- 3.4.3 In apprenticeships there is a clear role for employers in providing the work-related parts of the training and so they can adapt that part of the training according to labour market trends and skills needs.
- 3.4.4 Vocational training – both initial and continuous – outside of the secondary and higher education systems also has a role to play in bridging skills mismatches. In a world of continuous reskilling and increasing self-employment people will need help when moving from one job to another<sup>xxxi</sup>. For this reason, different forms of organising advice have to be developed, so as to

provide information about career paths, average financial conditions for different occupations and positions, how long particular skills will be useful, etc.<sup>xxxii</sup>.

- 3.4.5 New technologies such as virtual and augmented reality make learning easier, more effective and could radically improve professional training, while big data techniques offer chances for personalised training. In order for these opportunities to be used it is advisable that proper platforms providing cheap and instantaneous connections be developed and libraries with on demand courses be created. Besides all other advantages, such platforms also solve the problem of large distances for people in remote areas. This aspect of VET is currently underdeveloped compared to university education and needs to be strengthened.
- 3.4.6 In-house training in companies is another way to improve skills and to contribute to the improved productivity of workers and their professional development, to overall business performance and to employees' well-being at their work. It also motivates and enables them to progress in their career and earnings. Employee training is, therefore, a shared interest and employers and employees have a shared responsibility to contribute to upskilling and reskilling, leading to successful enterprises and an appropriately skilled workforce.
- 3.4.7 There are many different national laws, rules and approaches to the organisation and provision of employee training. Some MS have wide-ranging and strong vocational training policies set in legislation, while in others training provisions are set by collective agreements, at various levels, or agreed directly between employers and employees in the workplace. Opportunities to access training can also be dependent on the size of the company/workplace. Access to effective employee training should be facilitated while respecting the diversity and flexibility of systems, which vary according to diverse industrial relations practices.
- 3.4.8 MS and social partners should work together, exploiting the full potential of social dialogue on a tripartite and bipartite basis, to enhance access to and participation in employee training. This should be developed in a way that benefits all workers and enterprises/workplaces, as part of a lifelong learning approach that draws on the potential and actual needs of a diverse workforce in both the public and private sectors and in small, medium and large companies and workplaces.
- 3.4.9 The way in which training in the workplace is organised and undertaken needs to be jointly agreed between employers and employees through a mix of collective and individual arrangements. This involves training taking place preferably during working hours or, where relevant, outside of working hours (in particular for noncompany-related training). Employers should take a positive approach to employee training. But when a worker asks for, or has an entitlement to training, employers should have the right to discuss such requests to ensure that it supports the employability of the worker in a way that is also in the enterprise's interests.
- 3.4.10 Vocational training is not only for employees. Large companies usually provide their senior management with specialised training. But this is not the case for SMEs and particularly for small traditional and family businesses. The prosperity of these companies is almost entirely related to the owners/managers. Short training courses, access to advisory and consultancy services and to video courses – focused on legal requirements, regulations, consumer protection, technical standards etc. – could enhance the performance of these companies.

3.4.11 The European Commission should encourage MS to explore the positive experience in EU countries with well-developed VET systems and consider the possibility of developing programmes to facilitate such an exchange.

Brussels, 21 March 2019

Luca JAHIER

The president of the European Economic and Social Committee

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- i New Skills Agenda for Europe, 2016, European Education Area, 2018. The DG GROW project "Blueprint for Sectoral Cooperation on Skills" was also welcome, although its scope is very limited, as well as different EASME/COSME projects – e.g. 2017/001, 004, 007 and 2016/033 and 034.
- ii COM(2018) 268 final.
- iii [OJ C 237, 6.7.2018, p. 8.](#)
- iv [OJ C 62, 15.2.2019, p. 136.](#)
- v This was acknowledged by the European Commission – DG EMPL, and the Commission has provided financial and other support to OECD-led National Skills Strategy country projects in several MS, including Portugal, Italy, Spain, Slovenia and Belgian Flanders. In recent years, CEDEFOP has also implemented dedicated programmes supporting MS (Greece, Bulgaria, Slovakia, Estonia, Malta) in improving their skills anticipation and matching infrastructure: <https://www.cedefop.europa.eu/en/events-and-projects/projects/assisting-eu-countries-skills-matching>.
- vi [OJ C 13, 15.1.2016, p. 49.](#)
- vii <https://www.eesc.europa.eu/en/news-media/press-releases/skills-mismatches-eu-businesses-are-losing-millions-and-will-be-losing-even-more>
- viii "Skills Mismatches - An Impediment to the Competitiveness of EU Businesses", EESC.
- ix [OJ C 62, 15.2.2019, p. 136.](#)
- x [OJ C 237, 6.7.2018, p. 8, OJ C 367 10.10.2018, p. 15.](#)
- xi [OJ C 173, 31.5.2017, p. 45.](#) 40% of adult employees feel their skills are not fully utilised: <https://www.cedefop.europa.eu/en/publications-and-resources/publications/3075>.
- xii "Insights into skill shortages and skill mismatches". Learning from Cedefop's European skills and jobs survey, European Centre for the Development of Vocational Training (CEDEFOP), 2018. Also, Skills Panorama and Europass.
- xiii Unemployment Statistics, Job Vacancy Statistics, EUROSTAT.
- xiv "Solving the Talent Shortage", ManpowerGroup Employment Outlook Survey, 2018. Some are challenging the reliability of this study – e.g. Cappelli (2014): <https://www.nber.org/papers/w20382>.
- xv "Skills Mismatches - An Impediment to the Competitiveness of EU Businesses", study commissioned by the IME at the request of the EESC Employers' Group.
- xvi Ibid.
- xvii Other things being equal.
- xviii Ibid.
- xix [OJ C 440, 6.12.2018, p. 37.](#)
- xx [OJ C 440, 6.12.2018, p. 37](#) and examples of good practice could be found in Germany – where the "MINT skills" are enhanced with the help of the "House of the small researchers in town": <https://www.bertelsmann-stiftung.de/en/publications/publication/did/leitfaden-berufsorientierung-1/>.
- xxi BMW Foundation European Table findings.
- xxii [OJ C 367, 10.10.2018, p. 15.](#)
- xxiii <https://www.cedefop.europa.eu/en/events-and-projects/projects/big-data-analysis-online-vancancies>. Also see: "Overview of the national strategies on work 4.0 – a coherent analysis of the role of social partners", <https://www.eesc.europa.eu/en/our-work/publications-other-work/publications/overview-national-strategies-work-40-coherent-analysis-role-social-partners-study>.
- xxiv <https://twentythirty.com/how-digitization-will-affect-the-world-of-work>.
- xxv [OJ C 62, 15.2.2019, p. 136.](#)
- xxvi Such tools can give access to full degrees, shorter courses and specialisations as well as to nano degrees; provide flexible organisation by breaking the degrees into modules and the modules into courses or even into smaller units; offer opportunities for older workers to study in the later stages of their careers; reduce the cost and time of learning, and offer a better balance between working, studying and family life; give quicker and more flexible responses to the labour market's increasing demands to provide people with the desired qualifications and skills; create trust and help employers to get information about potential employees, when they are provided by well-respected educational institutions.
- xxvii <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013PC0857&from=EN>.
- xxviii <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetailDoc&id=36708&no=1>.
- xxix [OJ C 262, 25.7.2018, p. 41.](#)
- xxx <https://www.ceemet.org/positionpaper/10-point-plan-competitive-industry>.
- xxxi [OJ C 434, 15.12.2017, p. 36.](#)
- xxxii <https://www.bertelsmann-stiftung.de/en/publications/publication/did/leitfaden-berufsorientierung-1/>.