



Automation, digitisation, and employment

Volume 2 : The impact on skills

Summary

The digital transformation of the economy and the progress of automation are fuelling deep changes in the content of jobs and the structure of employment. During this transition period, the major challenge is to ensure that there is a proper fit between workers' skills and the needs of a changing economy, to enable everyone to have a quality job and to take full advantage of the transformation that is under way.

Volume 2 of this report intends, first of all, to make as precise a diagnosis as possible in a context that is, by definition, changing and uncertain. It seeks to better identify skills that are likely to be frequently requested in an increasingly digitalised and automated economy, and to assess the current state of skills in the French labour force against the yardstick of those new requirements. On the basis of that diagnosis, the Council puts forward the main strands of an overall strategy of skills transformation in the context of the digital revolution.

September 2017



Diagnosis: What are tomorrow's skills? Is the French labour force ready for the digital revolution?

To establish its diagnosis, the Council analysed the economic literature and mobilised various surveys.

Its analyses show that three groups of skills should be much more mobilised in a digitalised economy:

- expert skills in new technologies, in the technologies sectors themselves, and in all the economic sectors that use technologies;
- new technical skills as a result of the expected profound transformation of about 50% of jobs (*cf.* volume 1 of the report); and
- for all workers, an increase in the need for so-called transversal skills, which cover basic digital skills and cognitive skills (literacy and numeracy) as well as social and situational skills ("soft skills").

To better assess the significance of the demand for those various skills, as well as workers' current proficiency level for those skills, the Council has, therefore:

- sent a questionnaire to the OPCAs (Organismes Paritaires Collecteurs Agréés – Joint Commissions for Collective Training) to better assess the needs expressed by industries (expert skills, new technical skills, and transversal skills);
- carried out a study based on the OECD's PIAAC (Programme for the International Assessment of Adult Competencies) survey (transversal skills); and
- asked LinkedIn to produce data based on the use of its network (expert "tech" skills).

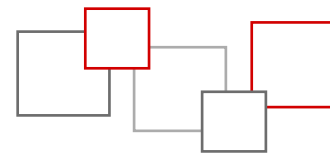
1. A growing shortage of expert skills in the tech sector, estimated at 80 000 jobs by 2020 for information and electronics technologies only

Taking into account the anticipated needs, the job-creation dynamic for the core professions of automation and of digital technology is expected to remain strong in France in the coming years.

According to the European *Empirica* report, in 2014, France had about 900 000 digital experts. The volume of employment for those profiles in Europe has risen by an average of 4% per year, ten times faster than the change in overall employment in recent years.

A large part of those jobs lies in the digital-technology sector, but those professionals also work in user sectors like industry or services to businesses. According to the working group "*Prospective des métiers et des qualifications*" ("Outlook on professions and qualifications"), about 110 000 new jobs could be created in information-technology occupations between 2012 and 2022. In a 2015 report, the European Commission estimates that 100 000 digital-technology jobs would be created in France between 2012 and 2020. That demand would mostly relate to qualified profiles.

Not all expert skills are called for at the same level. The data produced by LinkedIn for the Council show that the skills that are relatively most in demand include, in particular, those aimed at data management and operation, programming, and software design and maintenance.



Based on data concerning its users, LinkedIn estimates that 1.25 million registered workers state that they have expert skills in new technologies. 46% of users with such “tech” skills are concentrated in the Paris area. Half of users are spread across four sectors: information-technology services: (30%), industry (14%), finance (8%), and services to businesses (7%).

Taking account of the significance of expected job creation, the skills supply in France is insufficient (*Empirica* estimates the 2017 shortage to be 60 000 unfilled job offers), and will remain so in the years to come. According to the 2017 survey *Besoins en Main d’œuvre* (Labour Force Requirements) carried out by Pôle Emploi, 58% of planned recruitment in information-technology professions is considered “difficult”. The OECD’s skills database, released in July 2017, also shows that France has a significant shortage of technical skills in the fields of information technology and of electronics, and a more moderate shortage in engineering, mechanics, technology and telecommunications.

The *Empirica* Report estimates that 80 000 jobs could be vacant by 2020 in France. This figure relates to digital technology and electronics only: it does not cover shortages that are likely to be found in all the sectors related to new technologies.

This shortage should be less important than that recorded in other countries (for example, 161 000 in the United Kingdom and 150 000 in Germany).

2. A highly significant need for new technical skills: 50% of jobs will be substantially or profoundly transformed in relation to technologies

New technological/digital skills likely to be required in addition to many trades’ “standard” technical skills

In volume 1 of the report, the Council showed that half the current jobs in France are likely to change, in terms of their content, significantly or very substantially in a context of automation and digitalisation. That transformation takes the form of new skills requirements for professionals whose activities are transformed by the use of technologies in their companies.

Those new skills required to work in an occupation can be technological/digital. LinkedIn data show that “tech” skills, which are more naturally associated with experts in technologies, are already also held by workers holding other positions. Thus, 5% of workers registered with the social network and who hold “tech” skills are salespeople, and 1.8% are administrative employees.

New non-technological/digital technical skills in addition to or instead of many trades’ “standard” skills

However, by replacing certain tasks, by making work more complex or by enriching it, in other words by transforming work, technologies drive requirements in new non-technological/digital technical skills. **That is what the COE’s OPCA survey underlines:** its detailed results show that, in all sectors, job content and the nature of tasks that will be carried out are changing, regardless of the levels of job qualification.

Those new technical skills are greatly varied. Technologies have very diverse consequences, since, in some cases, they can lead to a reduced demand for human intervention; in other cases, they can support activity and allow the development of tasks with higher added value, or even a diversification of this activity. In all



cases, they bring about changes in the tasks that are actually carried out, by eliminating or streamlining some of them, or by adding new and often more complex ones, or by substantially modifying their content.

Thus, the COE's OPCA survey shows that, for agricultural professions, the automation of greenhouse cultivations requires agricultural employees to have more advanced skills in agronomy. Similarly, in the trade sector, salespeople are now expected to have a new level of product expertise when dealing with consumers who are themselves better informed. Such examples can be found across all sectors.

3. A significant proportion of the working population will have to swiftly acquire or upscale basic digital skills, as well as cognitive, social, and situational skills

Basic digital skills: 8% of workers in difficulty, 27% could make progress to be better equipped

Basic digital skills are not limited to knowledge of digital tools. They also include the ability to work in a digitalised work environment: the ability to show critical and creative thinking, and to use digital technologies in a responsible manner, especially when it comes to protecting confidentiality, the environment, or health. They form a growing area of expectation from employers for an ever-greater number of jobs.

However, according to the European Commission's statistics, which are based on the European reference framework DigComp, in France, **8% of the labour force have no digital skills, 27% a low level, 33% a basic level, and 29% a higher level.**

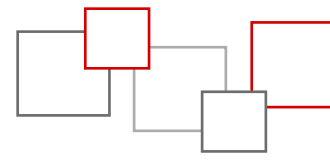
On average, the youngest and the most qualified have higher skill levels. 82% of 16- to 24-year-olds have basic or higher digital skills; that figure is 53% for 45- to 54-year-olds. 31% of low-qualified people have a sufficient level, as opposed to 84% for very qualified people. In comparison, in the United Kingdom, only 3% of the working population have no digital skills, and 22% have a low skill level.

Basic cognitive skills: 13% of the labour force in employment are in difficulty, 30% could make progress to be better equipped

The growing use of technologies at work also makes it more important to have general cognitive skills in literacy, numeracy, and "problem-solving", whereas there is a fall in the need for skills that involve physical tasks.

Moreover, it is likely that requirements may not be limited to the minimum skill set alone, but may require a more significant proficiency level.

The COE study shows that literacy and numeracy are more sought after in a digitalised work environment. It is among people with average and low qualifications that there is the greatest gap in requirements for those skills between workers who already make intensive use of digital technologies and those who do not use them.



The COE study also shows that, in France:

- **13%** of employed workers (i.e. 3.3 million) have a proficiency level in both numeracy and literacy that may place them in difficulty in their current employment or in seeking a new job; and
- **30%** (i.e. 7.6 million) could still advance in skills to be better equipped with respect to professional expectations in a more digitalised economy.

The study also shows there is no correlation between the risk of an insufficient proficiency level of literacy and numeracy and the level of qualification, but it can vary with age:

- it is observed for workers at all qualification levels, not only amongst workers with poor or average qualifications (it being understood that the level of demand for those skills is not the same based on the level of qualifications);
- seniors are over-represented amongst workers who could make progress in order to be better equipped and even more amongst those who are likely to be “in difficulty”. The situation of young people seems more favourable, but it is no less the case that a significant number of them are likely to be in difficulty ; the situation will thus not improve spontaneously as seniors leave the labour market.

The study also shows that in a more digitalised economy, an “insufficient” numeracy level may be even more of a handicap than shortcomings in literacy.

Finally, the Council’s study highlights the gap that exists, in certain jobs, between the skills held by workers and those that are asked of them at work.

It shows that on average, numeracy and literacy skills that are sought of workers who are currently working in a digitalised environment are higher than those that they possess.

Going the other way, a large number of workers with average and high qualifications and who work in a non-digitalised environment do not currently use all their numeracy and literacy skills. For them, the digitalisation of the work environment may represent an opportunity: it will enable them to make better use of their skills.

Social and situational skills: a necessary increase for a great many workers, in particular those with low or average qualifications

Technologies are also behind a generalised increased demand for social and situational skills, for two complementary reasons.

To begin with, the economic literature (Levy, Murnane, 2013; Deming, 2016) shows that tasks requiring these skills are difficult to automate. Thus, as the technological frontier moves gradually, the value of non-automatable tasks that call for social or situational skills rises.

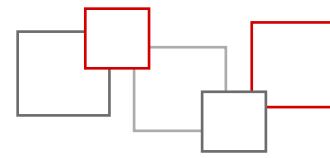
Next, quantitative and qualitative studies emphasise the fact that those technologies, by modifying the work organisation, reinforce the demand for these skills, which previously were expected for the most qualified professions.



The COE study confirms those analyses: thus, it shows that social skills (team-working and social intelligence) and situational skills (independence and learning to learn) are, on average, ever more sought after in a digitalised work environment.

The increased skills demand in this area is at its highest for people with low qualifications, and especially so for those with average qualifications.

The conclusions of the Council's study are in line with the OECD's analyses based on their skills database. The demand expressed for skills linked to adaptability – an essential situation skill – and to “leadership” is higher than supply in both cases.



Recommendations: Skills and the technological revolution: the main strands of an overall strategy

1. The approach: skills, skills certification, skills use

1.1 In the context of the technological revolution, we must not only continue to improve the level of qualification, but also act on skills

For a long time in France, the focus has been primarily on the qualifications acquired during initial training and the increase in the qualification level of the workforce.

Over and above the interest that it holds for the individuals themselves, individuals' qualifications remain an asset and a bulwark on the job market in the context of the current technological revolution:

- ◆ the technological revolution also involves employers seeking out skills that require a low or average qualification level, but the skills held by the most qualified people are more tailored to the digital transformation;
- ◆ **in addition, the COE study in volume 1 of the report shows that jobs that are most exposed to the risk of automation are often low-qualification professions, and that the current transformation in job structures “favours” the highest qualified occupations.** Work done by the OECD¹ also shows that, based on the level of qualification, workers are not exposed in the same way to the risk of automation. Thus, 40% of workers with an education level lower than that of the French *baccalauréat* hold jobs at strong risk of automation, whereas fewer than 5% of workers with a college degree and above hold jobs that can be potentially automated. **Hence, the overall effort to raise qualifications must be continued.**

However, the answer to the digital transformation cannot be limited to that overall effort to raise qualifications:

- ◆ **the question of professional skills (a set of knowledge and aptitudes at work) is essential in a context where the content of jobs changes rapidly and seems to have to evolve recurrently or even permanently;**
- ◆ the central challenge is that of **adapting qualifications**. It is a matter of taking better account, **along the entire scale of qualifications**, of the new skills requirements linked to the technological revolution and that had not been taken into account (or only partially so) until that point, such as social and situational skills. **The accelerated renewal of skills needed to deal with the speed of technological changes that are under way also involves putting new emphasis on the content of qualifications and other certifications as well as the way they evolve, which become decisive;**
- ◆ **it also invites a rethinking of the place that must be occupied by initial training, with its link to lifelong training** (what skills should be passed on and when, to enable them to pursue better career paths).

¹ Arntz M., Gregory T., and Zierahn U, (2016), “The risk of automation for jobs in OECD countries: a comparative analysis”, OECD.



The ambition is to avoid skills shortages or skills mismatches for people (job losses and risks of exclusion from the labour market), **for the economy** (pursuing deindustrialisation, loss of competitiveness), and **for social cohesion** (worsening of social and territorial inequalities) alike.

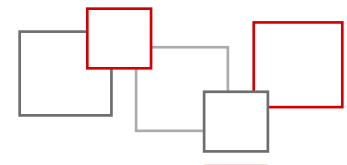
However, that does not mean signing up to a “matching” logic. Young people and workers must be allowed to find jobs, hold on to them, change jobs, and make progress; businesses must be allowed to find the skills they need and those they will need, and support the professional development of their workforce. That involves continuing to set up training programmes for current trades in their current configuration, but also beginning to lay the ground for what follows; helping certain businesses or sectors to maintain their human resources by putting in place wide-ranging training programmes; and satisfying new or emerging needs. It becomes paramount for companies to have better knowledge and better anticipation of skills that they need as part of an overall thought process linked to their economic strategy.

Through the presence of adapted skills in the working population, it is also strategically important to favour the development of sectors that are directly linked to the new technologies (digital, AI, robotics, 3D printing, etc.), which are characterised by a high level of skills turnover and by skills shortages.

1.2 The technological revolution makes skills needs change considerably

The Council's report shows that, in the current technological context:

- ◆ **increasing numbers of expert “tech” skills are needed in fields linked to the technological revolution (digital skills, skills linked to automation, and scientific skills in general);**
- ◆ **increasing numbers of trades are experiencing hybridisation of their content:** the same skills are called for in very different trades in very different industries and sectors; new technical skills are called for in existing professions that are undergoing transformation (the question of developing initial training programmes, and of interprofessional certification (CQPI : Certificat de Qualification Professionnelle Interbranches – Inter-Sector Professional Qualification Certificate), which enables training to be focused on transversal skills that can be mobilised in various activity sectors);
- ◆ **a set of transversal skills – digital, cognitive (literacy, numeracy, and problem-solving), social (team-working and collaboration) and situational (ability to adapt, and learning to learn) – will be needed to move in the job market in a more automated and digitalised economy, and develop an ability to act on one's career path. Basic digital skills are essential for everyone,** even if some new jobs are not qualified, not only for the most qualified jobs. One of the areas of the CLéA certificate (a reference framework for basic skills in a professional setting, drawn up by the COPANEF (Comité Paritaire Interprofessionnel National pour l'Emploi et la Formation - Joint National Interprofessional Committee for Employment and Training)) covers digital technology, but it is more a case of combating information illiteracy than guaranteeing real general digital skills. Moreover, working in a digital environment mobilises **more cognitive skills. As regards social and situational skills,** they are required because they are mobilised for tasks that are difficult to automate (protection), and because they complement “machine work”. For a long time, few training programmes emphasised the acquisition of those social and situational skills, except for some highly qualified training programmes. Except as regards their common basis (see CLéA), they are not acknowledged, they are not always given an accurate description and they do not always have recognised assessment procedures. **Among them, “learning to learn” is essential,** because the technological wave brings about deep changes in job content, which requires an ability to adapt, because it is required by the use of digital technology (questioning, doubt, experimentation, etc.), and because the technologies themselves are changing rapidly.



1.3 It reinforces the requirement for certification of all skills acquired

The certification of all skills, including transversal skills, is increasingly important in the context of a technological wave.

It brings about an increase in career prospects for workers.

The certification of all skills, regardless of where they were acquired and based on simple procedures, is necessary to improve their recognition at work, as well as to protect and improve career paths together with the functioning of the job market.

1.4 It involves ensuring the skills are called for at work

As part of one's job, being able to use the skills that one masters is naturally of key importance to people (the interesting nature of the work, valuing one's work, the risk of losing skills if they are not sought out). **Inside the company**, it is also important for managers, HR services, and work organisation (effectiveness as well as quality of life at work). Finally, it is a major **stake for the competitiveness of the economy**.

The Council report shows that there is a significant gap between skills that are acquired and skills that are sought out in an employment context.

It appears that in a technology-intensive environment, the degree to which workers' skills are sought after is, on average, higher than in low technology-intensive ones. That is a reason for optimism: it bodes well for a better match between skills possessed by workers who do not use technologies today, and the expectations of the job.

However, the level and relevance of that demand depend greatly on work organisation. That is why, in this report, the Council makes suggestions concerning managers' training, and it will devote a volume 3 to the questions of work organisation and working conditions in the context of the technological revolution.

2. The objectives: the bar is set high

The Council's report shows that:

- ◆ **the gap between supply and demand in relation to expert digital and scientific skills** is significant and growing (estimates of 60 000 jobvacancies in 2017, rising to 80 000 by 2020²);
- ◆ **a large number of workers – 13% – have a proficiency level in both numeracy and literacy that is likely to place them in difficulty in a work environment and an economy that are largely digitalised, whilst 30% could still make progress to be better equipped;** not all workers, far from it, have the **basics of general digital skills: at least one third of the labour force only has an insufficient level;** massive efforts must also be made for **social and situational skills** (CLÉA does constitute an effort and it is already the most mobilised by jobseekers as part of the CPF (Compte Personnel de Formation – Individual Training Account), but it is a base-level certification);

² Hüsing T., Korte W.B., and Dashja E., (2015), "Trends and Forecasts for the European ICT Professional and Digital Leadership Labour Markets (2015-2020)", *Empirica Working Paper*



- ◆ **10% of jobs are vulnerable, and 50% likely to be substantially transformed; carrying out those jobs will require new professional skills, whether digital or not.**

In the face of such a challenge, **quantified objectives** need to be set on a collective basis. In addition, certain indicators need to be monitored, such as the rate of participation in vocational training, especially for low-qualified or unqualified people, the proficiency level of basic and transversal skills, the access rate to the certification aimed at, performance, and the added value of training programmes.

Taking account of uncertainties that affect the scope and nature of the technological revolution as well as the speed of its dissemination, it is also necessary for public policies **to be permanently adaptable**, and for rules to be put in place that enable that adaptation as well as **wider use of innovative methods, e.g. calls for projects**.

2.1 Reducing the gap between supply and demand in relation to expert “tech” skills

This field is the subject of the most studies and work, as it is the most easily assessable, even if jobs linked to technologies are not all found, far from it, only in companies in the technology sector.

Not only is the existence of the gap known, but also that it is significant (not all the assessments are in agreement, but the orders of magnitude have been established) and growing.

In addition, if France wants to be in the vanguard in the field of technological innovations, initial and lifelong training constitutes a major strategic lever.

It is possible to set quantified objectives to be met, at national level, for initial and lifelong training in those scientific fields (digital technology, physics, biology, materials technology, neurosciences, etc.) for the various levels of qualification.

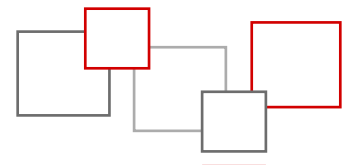
Quantified objectives must also be set for participation by girls and by women, with a view to increasing diversity in professions.

2.2 Giving young people and workers mastery of transversal skills

Over and above the strict professional skills that are specific to a trade or sector and that naturally remain indispensable, it is important to make a particular effort to improve mastery of skills that will be the most sought after in a digitalised economy.

First of all, this is true for general digital skills: in parallel with actions taken at the level of national education and universities to guarantee and certify the acquisition of basic digital skills, it is necessary not only to set the objective of putting an end to digital illiteracy - which involves, first of all, better detection of workers' shortcomings -, but also to remedy it (*see* the action undertaken by Pôle Emploi, which assesses the digital independence of jobseekers and experiments carried out in that context). It is also necessary to support workers who need to acquire and certify basic digital skills.

This is also true for cognitive skills (especially literacy and numeracy): France has a low level in comparison with other countries (ranked 21st and 22nd out of 24, according to the OECD's PIAAC survey), and in that regard, the COE's study highlights a level of general mastery that is insufficient, whereas those skills will probably be much more sought after in the future.



Finally, it is true for **social and situational skills**, which are increasingly required in line with the gradual spread of digital technologies.

If policies in that regard are not undertaken and developed, the current technological wave could lead to widening inequalities.

2.3 Managing the transition for workers in jobs

In volume 1, the Council showed that although fewer than 10% of existing jobs show an accumulation of vulnerabilities that are likely to threaten their sustainability, half of existing jobs are likely to undergo significant to very substantial change in terms of their content.

Based on an analysis produced by the COE on the basis of PIAAC data, the results of its OPCA survey, as well as all existing work (CNI (Conseil National de l'Industrie – National Industry Council) sectors, Pôle Emploi surveys, Sector Observatories, Regional Observatories, Réseau Emploi Compétences (Jobs and Skills Network), etc.), the objectives must cover:

- ◆ **transferable and non-transferable technical skills, which must be added to / updated for many traditional professions given the rationale of hybridisation of professions ;**
- ◆ **specific action for local labour markets identified as vulnerable (see volume 1) due to their economic specialisation and / or characteristics in terms of skills or employment of the labour force;**
- ◆ **specific action aimed at people with low or no qualifications, who hold an essential share of vulnerable jobs or jobs that are likely to be profoundly transformed in the context of digital transformation and of automation, to prevent an increase in inequalities; and**
- ◆ **by also watching over workers who experience new forms of work (platforms).**

Although training is not involved in all acquisition of new skills, the size of staff numbers involved and the speed of technological change invite a rethinking of our traditional modes of intervention in relation to training.

2.4 Improving training for managers and support for microbusinesses

Training for managers

- ◆ Ensure that all **business schools** provide training in digital, social, and situational skills (and in their effective adaptation to the context of the digital transformation of businesses), as well as training in managing the digital transition for collaborators (supporting changes in skill requirements for the job, adopting a listening attitude, etc.);
- ◆ Set objectives for **training managers in post**, with specific action for middle-level management.

The digital transition of microbusinesses

That begins with raising awareness amongst executives and training them: heads of business, the self-employed, and auto-entrepreneurs. It also involves **specific support for the digital transformation of microbusinesses / SMEs**, as has been done by some OPCAs and some regional authorities.

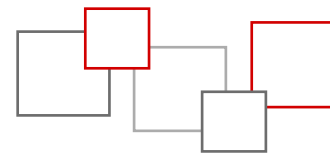


3. An overall strategy is needed

The challenges are such that there must be an overall strategy:

- ◆ **a challenge linked to the overall nature of transformation itself** : 10% of jobs are likely to be eliminated and 50% transformed, in all sectors of the economy and across the country, in variable proportions and on variable terms;
- ◆ **a challenge involving the location of jobs that are created / transformed / cut.** Jobs need to be created everywhere, not just in metropolitan areas. Potential job losses need to be minimised, professional mobility needs to be made more secure – especially by transferring rights to people -, professional-development consultancy work must be strengthened, and a new role must be defined for public services aimed at the most vulnerable³. France and each local labour market must be attractive to skills that are sought after in the job market;
- ◆ **a challenge as regards speed:** the current technological wave has been unprecedented for several generations, with very short economic cycles linked to technologies. There is a need to make progress in the swift identification of skills requirements, to have good certification tools (new certifications and adapting existing certifications), and to have options for assessing workers' skills in order to facilitate mobility in time. All of that – there is no denying it – with high risks (a technology can be swept aside by another within a brief period), and the best compromise to be found between the short time of technologies and the time for acquiring and certifying skills, which can be long;
- ◆ **a challenge of quality and assessment:** the requirement for speed of adaptation of training programmes must go hand in hand with increased vigilance of their quality. As an extension to reforms undertaken in that regard, it is important to provide a better definition and assessment of the added value of training programmes, and to ensure the transparency of the methods and indicators used as well as of the results;
- ◆ **a challenge linked to the specific nature of certain transversal or transferable skills,** mainly social and situational skills that will be asked of everyone – challenges linked to acquiring (education), certifying, and assessing those skills – and emerging technical skills (challenges linked to the hybridisation of professions, a new phenomenon for a training system that is essentially organised on a “vertical” basis and a “sector”-based approach; however, the creation of CQPIs is intended to supplement it);
- ◆ **a challenge in terms of volumes:** significant needs for new skills; massive transformations of existing jobs (challenge in terms of availability and of financing a significant training offer, and the challenge of access to those training programmes);
- ◆ **a challenge linked to the transition period,** with significant new requirements for “new trades” linked to technologies; further significant needs for “traditional” jobs, where there may be skills shortages if young people are guided towards “new jobs”; and, finally;
- ◆ **a challenge in terms of responsibility:** the context of the technological revolution calls for workers to be made better aware of the need to be committed to a pathway approach and to adapt their

³ See the 2016 COE report on Support towards and in employment



skills, especially through training. **That cannot mean that the responsibility should be left to individuals alone; the responsibility of businesses and the role of public service are also essential.**

To face up to those challenges, there is a need to make further progress in order to put such a strategy in place:

- ◆ **progress needs to be made in relation to knowing the skills mastered by workers (not only skills mobilised at work). No survey goes down to regional level, all the more so to the local labour market; that is a problem, given regional authorities' responsibilities in that matter;**
- ◆ **to begin with, the various institutions (education system, vocational training sector, labour market institutions, the State, and regional authorities) have no "common language". Despite the various reforms undertaken since the start of the 2000s, there is a lack of a genuine shared skills reference framework (specific and transversal skills) and a systematic approach based on skill sets.** All that to "translate" all certifications in skills and skill sets, in line with the efforts undertaken at European level, to structure the training offer and the changes that it needs, and to properly guide financing. That is penalising when it comes to drawing up and implementing public policies, but also and especially for stakeholders who cannot find their way in it (businesses as well as people in training or employment). It is also penalising for developing a culture based on skills and professional development (in one's business or when changing business) within the labour force, to disseminate its tools, its functions, and its challenges;

There is no satisfactory pooling of the multiple work that has been done at all levels to anticipate changes in skills requirements (ministries, sector observatories, regional observatories, the AFPA (Association pour la Formation Professionnelle des Adultes - Association for Adult Vocational Training), administrations, job boards and professional social networks, public statistics, professional organisations, international organisations, etc.). Everyone works largely in isolation. The very quality of each piece of work suffers from the consequences of a context that too exclusively reflects the economic and institutional strategies and constraints of each one. Finally, the standard methods of understanding requirements are insufficient with respect to the speed of changes that are currently under way. This requires a change in methods to swiftly grasp changes on the ground, and not draw analyses from a reality that is already outdated;

- ◆ **our certification system is not set up to quickly adapt to changes in skills requirements, observed or anticipated: the relevance and the up-to-date nature of all professional titles and qualifications are not guaranteed;**
- ◆ as was underlined by the IGAS (Inspection Générale des Affaires Sociales – General Inspectorate of Social Affairs) – IGAENR (Inspection Générale de l'Éducation Nationale et de la Recherche – General Inspectorate of National Education and Research) report on assessing the policy on professional qualification (July 2016), the far too limited powers and means of the Commission Nationale de Certification Professionnelle (CNCP – National Commission for Professional Qualifications) lead to **insufficient regulation of the offer in professional qualifications.** It is difficult to build a career path by putting together certified sets taken from various certifications, since those blocks are not homogenous. It is understood that the "skill set" logic must strengthen the relevance and the assessment of overall certifications. **Thus, the Répertoire National des Certifications Professionnelles (National Directory for Professional Certifications) and the Inventaire (Inventory) are incomplete and not easy to understand, and they do not sufficiently bring out homogenous "skill sets" for all certifiers;**

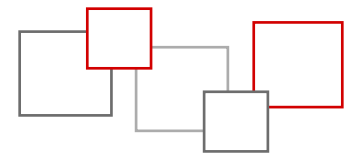


- ◆ **the training and certification system is well behind when it comes to incorporating all the skills that are useful for the technological revolution, and all the more so when it comes to acknowledging transferable skills**, as well as for mobilising the financing needed for the corresponding training programmes;
- ◆ **the cumbersome nature of our system does not allow it to timeously change the politics of all, or to timeously update the content of all certifications:** and yet, that is essential in a context marked by great uncertainties regarding the speed at which the technological frontier is shifting, as well as the speed with which new technologies penetrate businesses and economic sectors;
- ◆ **financing is currently organised in a too-complex way. Its management mobilises energies that could be better used to set public-policy objectives. It does not guarantee that everyone will acquire a set of transversal skills** – digital, cognitive, social, and situational skills – that are necessary as a citizen and as a worker, **or that financing will be focused as a priority** on acquiring transversal or transferable skills that enable people to find jobs, keep their current jobs, or timeously engage in good professional mobility, **or that training will be given to sufficient numbers of people in a profession / economic sector / country affected by digital technology;**
- ◆ **regulation of the training offers** is based on a large number of stakeholders and different updating frequencies, **so it has no national “feedback” system to ensure that useful training programmes are available, and that those with little relevance disappear;**
- ◆ **the acknowledgement of skills acquired through professional experience (VAE: Validation des Acquis par l'Expérience - Job Experience Certification) is complex, and it does not benefit enough people, whilst the acknowledgement of skills acquired outside school or work is non-existent;**
- ◆ **despite recent reforms (CEP (Conseil en Évolution Professionnelle – Professional Development and Consulting), CPF, and CPA (Compte Personnel d'Activité – Activity Personal Account)), individuals' abilities to know where to turn and receive guidance in this respect are still largely insufficient for a system that is difficult to understand, with there being an insufficient response to an increasingly significant need for support.**

4. A method

4.1 Placing digital transition and automation at the heart of social dialogue, and reinforcing the role of social partners: giving them a right of initiative to draw up and adapt reference frameworks and certifications

- ◆ In businesses or in sectors, social partners are best placed to take overall account of the impact of technologies, to raise awareness, update skills, preserve employment, guarantee better work organisation and better quality of life at work, and guarantee the successful introduction of new technologies to the business. Best practices exist (*see* agreements in large businesses in France and Germany). But there is still a need to strengthen the place of social dialogue in that area.
- ◆ Digital transition and technologies must be at the heart of a **renewed GPEC (Gestion Prévisionnelle de l'Emploi et des Compétences – Forward-Looking Management of Jobs and Skills) and a territorial GPEC that is more developed**, so as to also bring in small businesses. In sectors and businesses, it could be a real factor in anticipating changes as well as a lever for creating future jobs and securing current ones, in connection with the economic strategies of the business or group.



- ◆ The results of the COE's OPCA survey show that the level of satisfaction with the pace and method of changes of certifications is low, including for sector certifications. **Economic stakeholders and social partners should have a central position in drawing up reference frameworks and in adapting the content of certifications.**
- ◆ **The status quo in relation to inter-sector certifications (CQPI), which encourage mobility between sectors, is unacceptable.** Social partners must act in that regard to develop that tool, which is particularly suited to the current context of changing skills requirements. To begin with, it means that the various sectors share a consistent methodological framework for certification. It also means that the subject should be explicitly addressed within large sectors (for example, in the context of the CNI's sector committees). It would be desirable to have quantified objectives in that area.
- ◆ As part of the social dialogue at sector and enterprise level, it is for social partners to **ensure that there is a link, on the one hand, between acquiring skills and certifying them, and, on the other hand, the professional development of individuals, including as regards salary.**

4.2 A "Grenelle Forum" on skills, and governance tailored to overcome compartmentalisation

- ◆ **With all stakeholders:** ministries, social partners, regional authorities, and training bodies, as well as associations and stakeholders involved in insertion. Analysis of foreign best practices. Ongoing, joint work. Regular assessments of attaining objectives.
- ◆ **Put everything on the table:** we now have an analysis corpus that is becoming significant, to understand more precisely the quantitative significance of the need to renew skills, as well as the professions, sectors, and regions that will be most affected by job transformation (see in particular, the COE's work, volume 1, which assess the impact on the volume of employment, its structure, and its location).

It is currently the case that each stakeholder produces its studies following its own logic, methodology and requirements. All that work is not currently shared, and cannot be shared or have any operational continuation due to the lack of a common language (see the work done by sector observatories or carried out within regions, PMQ (Prospective des Métiers et Qualifications – Outlook on professions and qualifications), etc.).

The challenge here is to set up a stronger and more structured link between the elements of the diagnosis which are available and the regulation of training offer and content.

- ◆ Taking account of the strategic nature of the technological revolution, the State and social partners must agree on **a common doctrine on training** (accessibility, priorities, and financing). For example, the traditional meaning of the notion of "vulnerable person" usually relates to jobseekers and to unqualified people; it needs to be revisited for it to include employees whose jobs are / territories where employment is under threat or likely to be profoundly transformed due to technologies.
- ◆ **Plan an adapted governance, with national steering, to overcome compartmentalisation:** Faced with a broad-spectrum transformation – the speed of which exceeds that of the institutions being transformed, the main thing is not to launch into Meccano[®]-style operations that last for years and waste a lot of energy. Of course, each institution must undergo transformation, but adapted governance must be promoted that frames, so to speak, historic segmentations and introduces horizontality into diagnoses and decision-making. It is therefore necessary to go beyond:



- a merely vertical rationale (sectors, branches, etc.);
 - geographical segmentations (regional authorities form a level that is relevant for the fine geolocation of the needs of businesses and for the training offer, but there is no national “feedback” arrangement, no safety rope, and no overall anticipation. There is still an occasional lack of co-ordination and co-operation between the State, regional authorities, and social partners, even if the development of territorial platforms that are based on local labour markets can be observed);
 - sectoral logic (secondary and higher education / vocational training). For example, open up *lycées* (secondary schools) and faculties much more widely to vocational training. As part of the European skills strategy, the recent establishment of a “National coalition” that brings together stakeholders from all backgrounds (public authorities, social partners, businesses, etc.) and that enables visibility to be given to the various initiatives for developing an overall strategy on developing employment and skills in relation to digital technology must thus be encouraged.
- ◆ **it is essential to ensure that experiments are fully included. From the very outset, plan assessment and dissemination of best practices ;**
 - ◆ **establish a link that is more sustained, swifter, and more collaborative between diagnoses and decisions.**

5. Strands of change

All the levers above must be activated to meet quantitative needs in a satisfactory schedule. We must adapt our system of education, training, guidance and certification, so that acquiring and certifying “appropriate” skills more attractive and simpler for everyone.

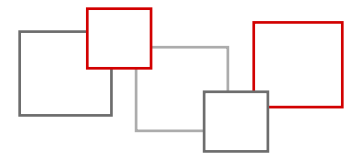
An overall skills strategy must plan for action on the following levers:

5.1 Improve knowledge of skills and their development

Having the right indicators would enable errors of analysis to be avoided: until now, the angle of attack to make progress in that subject has led to prioritising an approach based on digital technology and, as such, aimed at the digital sector and digital skills. That approach is obviously necessary, but it remains largely insufficient:

- ◆ **France could take part in the module on “problem-solving in a digital environment” for PIAAC;**
- ◆ **with the financial involvement of regional authorities, guarantee the implementation of relevant diagnostic tools at local level, to get to know the supply and demand in relation to skills in territories and ensure their compatibility with national and international reference surveys;**
- ◆ **systematically carry out sectoral analyses of changes in professions and skill requirements, and use new methods to guarantee their “freshness” and relevance.**

Sectors often have observatories of professions and skills. Some of them have carried out forward-looking analyses of the impact of the digital transition. However, that movement is still far from being generalised, and it must still be placed on a systematic footing.



This forward-looking diagnosis can also be done by different industries. The example of the shared forward-looking vision of jobs and skills in the digital sector is an interesting one. That type of approach is no longer built up from projections based on macro-economic scenarios, but on the “realities of industrial and territorial strategies”, and it highlights the usefulness of involving all the stakeholders concerned, not just experts, to enable better adaptation to businesses’ expectations. As part of a partnership between the CNI, France Stratégie, and the Céreq (Centre d’Etudes et de Recherches sur les Qualifications – Centre for Research on Education, Training, and Employment), the initial results of that experiment carried out on the digital sector were made public in June 2017. The initiative is laudable; however, it remains quite isolated for now, and it could be more clarified.

- ◆ **develop research and experiments (complementary to those already undertaken by the National Education system) on social and situational skills;**
- ◆ **develop research to assess the consequences of training for the skills of tomorrow for employers** (productivity and a higher ability to innovate) **and workers** (better recognition of their skills, improvement in working conditions, and professional -including salary- development);
- ◆ **bring together in a single tool all existing data** (public statistics, administrative data, job offers, etc.) to enable sectors or territories to extract them easily, a proposed homogenous format to guarantee the comparability of analyses, etc. This tool could thus be a support for making businesses aware of a culture of anticipating their changes in relation to skill requirements;
- ◆ **accelerate “digital EDECs”:** EDECs (Engagements de Développement de l’Emploi et des Compétences - Commitments to Developing Jobs and Skills) are useful tools to support businesses and their employees in the economic changes that sectors must deal with. However, until 2016, they only imperfectly took account of the digital transformation. Their current repositioning to take better account of the digital transformation and its opportunities must be boosted. In that regard, the EDEC signed in November 2016 in the textile sector, and which was clearly focused on digital transformation, is an interesting precedent, in the same way as EDECs signed in the plastics-processing sector (in July 2017). In the same way, in conjunction with interprofessional OPCAs, inter-sector digital EDECs must be encouraged, especially for smaller sectors. In that regard, a recent EDEC signed with the Agefos PME (Association pour la Gestion de la Formation des Salariés des Petites et Moyennes Entreprises – Association for training in SMEs) targets micro-businesses / SMEs in particular.

5.2 Improving our system of school careers and vocational guidance, and better disseminating the CEP

- ◆ **All guidance stakeholders must be made aware of:**
 - the attractiveness challenge for certain sectors, especially in relation to digital technology / robotics, and of the massive requirement need for expert skills in those sectors;
 - new professional skills that will be soon required for several professions and jobs; and



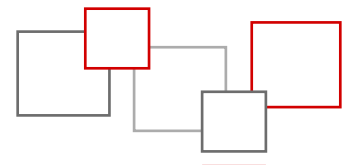
- transversal skills which are essential to acquire, right from initial training, for ease of finding a job in the future and to be able to manage any career path under good conditions.
- ◆ **The challenge of girls' access to scientific training is also essential.**
- ◆ **Identifying shortcomings in transversal skills** (digital, social, and situational) **must be genuinely organised**, over and above what Pôle Emploi will do on a systematic basis. Several stakeholders and institutions can be mobilised to that end (Journées Défense et Citoyenneté (Defence and Citizenship Days); social workers from municipalities and *départements*; HR teams within businesses).
- ◆ **New awareness-raising campaigns must be organised that are aimed at** (information and communication items taken from the work mentioned above) **small and medium-sized businesses** on the need to invest in training their employees in the use of digital tools, in conjunction with available making practical means and solutions, such as self-diagnosis tools, so that they can take up the challenges of digital technology for their employees, and give the latter the time needed for training, **and at workers, especially, but not only, those who are least qualified** and who are most vulnerable in the face of the rapid development of new technologies.
- ◆ **CEP (Conseil en évolution professionnelle - Professional development consulting):** *A priori*, the CEP is a powerful tool for guiding and supporting workers in managing their career paths, as well as for identifying the skills that they will have to mobilise. However, as was underlined by the CNEFOP's (Conseil National de l'Emploi, de la Formation et de l'Orientation Professionnelles - National Council for Vocational Guidance, Training, and Employment) second report on monitoring and implementing the CEP of July 2017, it remains largely unknown, especially for workers in post. Better dissemination of the CEP would be especially facilitated by incorporating it into the CPA (Compte personnel d'activité – Activity personal account) site, and by sustained communication efforts on the part of institutions in charge of its implementation.

5.3 Reforming our certification system

Our professional-certification system is a result of the 2002 Act, and it was a genuine step forward. However, it is a very imperfect response to the objectives that were assigned to it: ensure that everyone is properly informed and that the training offer is understandable, regulate the certification offer to guarantee that certifications are tailored to the needs of individuals and businesses, and facilitate access to certification (see the IGAS-IGAENR report). Despite the important work done by the CNCP, the latter is not able to ensure relevant regulation of the certification offer, in particular because of limited powers and means. It is important to:

- ◆ **set up an interministerial structure (High Commission or Agency type -as proposed by the recent IGAS-IGAENR report⁴), with active participation by social partners**

⁴ IGAS and IGAENR, 2016, "Evaluation de la politique de certification professionnelle"



Such a light, “mission” structure, that nonetheless has more human means than the CNCP, would rely on all existing stakeholders (public administrations, social partners, the AFPA, Pôle Emploi, digital stakeholders in the job market, regional authorities, etc.), whose work it would bring together as well as having authority to act.

Its mission would be to redefine a shared skills reference framework. It would be in charge of registering certifications with the RNCP and would be given the means to ensure that those certifications are up to date, whether it involves titles from ministries, from professional sectors, or from other certification holders. That would contribute to better guarantee the relevance of the training offer in relation to requirements in a context of technological revolution, to enable everyone to find their way and take the right decisions at the right time, and to guide the training offer and financing (public, social partners, and regional authorities) accordingly.

- **set up a shared reference framework of all professional skills**

Our certifications and the training offer must be much more understandable than they are currently for young people, workers and businesses, in order to enable them to have the right information at the right time, and thus be able to make the right decisions.

For that purpose, it is important to first have a common language, i.e. a shared, public reference framework of professional skills, continuously adapted on the basis of observed and foreseeable changes in the job market.

That reference framework should cover all skills, including transversal skills (digital, social, and situational), as well as the various levels to which they are mastered. Currently, for transversal skills, CLÉA covers only the basic core, not higher skill levels.

It should be **organised in skill sets**, so that all certifiers can organise all their titles into identical sets to ensure better transferability.

It would be set up under the authority of the High Commission / Agency in line with ROME – the Public employment service reference framework–, the work done at European level in the area (ESCO) and the one done by professional sectors.

Social partners and in particular representatives of professional sectors and their Observatories as well as of specific industries would have a permanent entitlement to take the initiative in updating the reference framework based on changes in trades.

- ◆ **speed up the review of qualifications, titles, or CQPs if changes are identified in a trade in conjunction with the rapid spread of technologies.** That means two changes to our certification system:

- ensure that professionals (and, thus, social partners) are better associated with drawing up and reviewing titles. That association is very unequal, as was emphasised in recent opinions issued by the Conseil National Education-Economie (National Education-Economy Council), which made relevant recommendations that are shared by the Conseil d’Orientation pour l’Emploi;

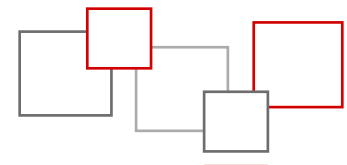


- being able to suspend the registration of titles, qualifications, and certifications that have not been regularly reviewed; that means setting a general principle of compulsory periodic review;
 - plan for changes in the reference framework of skills to be able to trigger a process to update the corresponding certifications on the initiative of the high commission / agency.
- ◆ **establish simplified procedures for rapidly creating new certifications on a temporary basis for new trades that appear in line with technological progress;**
 - ◆ **update the content of qualifications to better take account of transversal skills;**
 - ◆ **speed up PIX (a planned public online platform for assessing and certifying digital skills) so that it becomes a recognised certification and accessible to all.** PIX could go together with supplementary professional-sector certifications for higher levels. In that way, France could position itself as a reference in Europe in relation to a mode of assessing and certifying basic digital skills;
 - ◆ **set up simple certifications of social and situational skills, at all levels and starting with the secondary-education system;**
 - ◆ **set up simple certifications, e.g. using digital badges, of skills (especially transversal skills) acquired somewhere other than in training or at work;**
 - ◆ **guarantee genuine co-ordination of the studies and work done by all public and private certifiers.**

5.4 Promoting all the levers available for developing skills

Training is one of the levers available for developing skills, but it is not the only one.

- ◆ **The link between apprenticeships (formal, non-formal, and informal) and their certification must be improved.**
- ◆ **Training at work** must be encouraged.
- ◆ **The VAE (Validation des acquis de l'expérience – Job experience certification) must be encouraged, thus reformed in depth. It is a way of recognising skills and a relevant way to access qualification,** whilst enabling paths to be made secure and encouraging social promotion. The tool is in principle tailored to a skill-development strategy, and it has been faltering for a long time. Several recent reports have proposed paths of reform, (COPANEF in February 2016, IGAS and IGAENR in October 2016); they must be implemented, in addition to those already planned by the Act of 8 August 2016.
- ◆ It is also necessary to acquire the tools needed to monitor the paths for acquiring skills and certifications, especially, of course, for people with low or no qualifications. Over and above training programmes and certifications, the career path itself can be a key to professional success.



5.5 Tailoring the training offer to the swift change of the technological context

More than ever, the initial and vocational training system is a **strategic sector**.

The context of the technological revolution all at once **enables and requires** that it change in its methods and content to meet the needs identified in this report.

Those changes must cover initial training, lifelong training, and how they are linked. On the one hand, because the context of rapid change turns acquiring and updating skills into a continuous process. On the other hand, many requirements relating to the skills of workers in post – whether it is a matter of requirements for expert skills in the technologies sector, or requirements for transversal skills – relate to skills (especially knowledge) that should have been acquired during initial training.

The consequences of the technological revolution under way confirm the direction of lifelong training reforms since 2002: (professional certification, consideration of “transversalities”, new pooling, new investments or new margins for manoeuvre given to workers to better master their career paths and professional development (CPA), tools aimed at helping them in that regard (skills assessments, CEP, and the idea of support towards and in employment). As has been stated above, workers cannot be made solely responsible for their training; businesses and public service also have an essential role. **Accelerating the implementation of those tools must be a priority.**

They also invite us to go much further.

- ◆ **Training must develop in its methods**

The manner in which skills are acquired (education) counts as much as the skills themselves:

- ✓ ***There must be continuing adaptation of schools and universities to a digital environment***

Schools and initial training are not intended to adapt continuously to short-term transformations of job markets, which are generally local ones. However, digital transformation **brings about a profound and long-lasting modification of educational practices** (“extended school”, individualisation of learning, online tutorials, etc.). Moreover, digital technology supports **a culture of trust, doubt, risk, error, and skills**, rather than knowledge only. Those values were not always conveyed by schools in the past; schools must adapt. Teachers and instructors must have basic digital skills. What is more, they must be involved in, the development of practices relating to digital tools and culture. In like manner, “knowing how to guide oneself” should be considered a skill taught at school; it is one of the dimensions of the emancipation of individuals and of their professional success. Several experiments are currently under way; they must be assessed accurately.

- ✓ ***The sector of lifelong training and the regulation that governs its activity must undergo their own revolution in conjunction with the technological revolution***

The digitalisation of training opens up new avenues for inventing and implementing differentiated, multimodal teaching. It is a pathway for more personalised content, as well as lower costs that can allow more employees and jobseekers to access training. Training itself can be located at the workplace and get around reluctance relating to “going on a course”. It also enables audiences that are sometimes very remote from training to be reached more easily (for example, people who are supported as part of IAE (Insertion par l’Activité Économique – Insertion through Economic Activity) and for whom digital tools for assessing and acquiring skills ought to be developed).



As has been shown by the IGAS report on the digital transformation of lifelong training (2017), the training sector lags behind in its digitalisation (according to a survey carried out by the sector of private training bodies, in 2016, 52% of private training bodies made no turnover from distance digital training), but it is also decisive if the intention is to acquire the means for a programme aimed at preparing for the transformation of so many jobs across the country and guaranteeing accessibility to training programmes for all regions and for businesses of all sizes (micro-businesses).

Support must be provided for professions that, henceforth, must not only deal with new methods – not only in a face-to-face setting –but also support individuals along the whole of their training paths.

Taking account of the strategic nature of the sector and of the immense challenge of the volume of training to be undertaken within fairly short periods, public action must support that change in conjunction with professionals.

◆ **The content of training programmes must change:**

- **there must be an increase in the offer, financing, and assessment of training programmes for transferable skills or skills that are complementary to technologies;**
- **the training offer must also adapt to the hybridisation of professions** brought about by the technological revolution: in the profound transformation of jobs that is under way, certain skill sets to be acquired must be acquired for jobs in very different sectors;
- **how management is taught must change** to promote the dissemination of the most relevant types of work organisation and human-resources policies, in conjunction with the dissemination of technologies, and the best able to link a skills policy (GPEC) to the performance of the business.

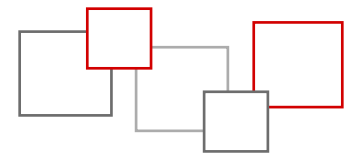
◆ **The volume of training programmes must change:**

- **we must acquire a national feedback ability in relation to the training offer for new or strategic skills linked to technologies:**

If there appears to be a lack of training programmes for **skills that are deemed new and strategic** (linked to new technologies, the digital transition of some current professions and jobs, or basic transversal skills for all), **the state must be given the means to act directly by acting on the offer and its mapping. That has already become the case for jobseekers:** the Act of 9 December 2016 provides that the State can *“organise and finance, for the benefit of people seeking employment, training programmes of which the low level of development or the emerging nature justify, whether temporarily or in the longer term, actions defined at national level to meet skills requirements.”*

In that spirit, it could be planned to **widen the field of intervention of the university (*Grande École*) of digital technology**, whose scope is currently limited to certain training programmes, most often short ones, for the least qualified young people and on a few job segments in the digital sector.

- **taking account of the needs assessed by the Council** (50% of current jobs are likely to be significantly transformed, and 13% of workers currently in employment are likely to have



difficulty with numeracy and literacy in the context of a more digitalised economy), **the training action must be reconsidered**. The Act of 8 August 2016 already provides initial details on the training action. Training programmes that are at least partly online are valuable in acquiring new skills even before “standard” face-to-face training programmes are set up, as well as for ever-growing numbers of people across the whole country and in small-sized businesses.

- the digital transformation affects employment and skills in sectors with a large labour force. Moreover, a considerable number of workers, whether or not in employment, must acquire new transversal skills. Even if costs can be reduced for training programmes in larger numbers and with at least partial recourse to digital means, it is unthinkable that standard financing of vocational training can be enough to meet all needs. **Accordingly, it is necessary to organise the pooling of new financing, bringing together the State and social partners, to be able to act in time and “in bulk” where needed and as soon as needed, and not only in relation to jobseekers and young people.** It is already the case that the FPSPP’s (Fonds Paritaire de Sécurisation des Parcours Professionnels – Joint Fund for Safeguarding Career Paths) calls for projects entitled “Mutations économiques et technologiques” (“Economic and technological changes”) follow such a logic, but the context of those calls for projects remains a large one, it does not directly pinpoint the digital transition, and it remains provided with limited means. **Taking account of the size of the requirements, it will be important not to finance training programmes that have not been shown to work for access to employment or remaining in employment.**

It will also be important to keep in mind that any skills update or increase in skills is not necessarily due to training actions; skills can also be acquired through professional practices or in informal settings.

- apprenticeship provides a good fit between skills delivered during initial training and the needs of businesses. It has been shown to work for the professional insertion of young people. Thus, it must also be developed as a mode of access to digital professions (digital CFA (Centre de Formation des Apprentis – Apprentice Training Centre)), as has been done in other countries (ie. United Kingdom).
- Innovative second-chance programmes must be developed that enable drop-outs to acquire digital skills.