

CLEPA White Paper on Education, Training and Learning to Increase Competitiveness in the Automotive Industry

Executive Summary

This paper outlines how education, training and learning issues have come to affect the European automotive industry and its competitiveness in the global market, and how all stakeholders, including the industry itself, social partners, national governments and the European institutions, need to meet this challenge together to sustain jobs and incomes for millions of Europeans in the future.

A vital industry for Europe

The European automotive industry is a key player in the European Union today. Human resources are the automotive industry's main asset, with an estimated 10 million workers employed in the motor vehicle manufacturing industry across Europe. Of those, approximately 8 million jobs are to be found in the automotive supplier industry. Consequently, being one of the biggest employers in Europe, it is necessary that the automotive sector maintain its competitive edge, as only this will allow the companies to continue employing people in Europe.

Today it has become clear that the European automotive industry is losing competitiveness as challengers from lower-cost economies have increased their share of world automotive markets at the expense of the European suppliers and manufacturers. To reverse this dangerous trend, the public and private sector in Europe must, above all, seriously invest in education, training and learning for all.

A knowledge-based industry with increasing skill needs

Over the past decade the automotive industry has gone through profound changes due to the challenge from global competitors. The industry continues to rapidly transform in the face of technological developments that change both processes and products, making the automotive sector an increasingly knowledge-based sector, characterised by lean thinking. In the European automotive industry today, competitiveness largely depends on three factors: price, innovation and quality. Since it is difficult for the European automotive industry to compete solely on the basis of cost, the competitiveness of the industry will therefore depend on the companies' capability to put forward innovative products and high quality, technically advanced solutions for products as production and development, while also being at the cutting edge of marketing and distribution. Only a well-trained, skilled and motivated workforce can make this a reality. The quality of the workforce, in turn, will be determined by the quality of education, training and learning.

The increasing sophistication of vehicles and production requires both basic competences and new skills, whether personal (e.g. problem-solving, team working, customer care), technical (e.g. Information and Communication Technologies), or theoretical (e.g. mathematics, foreign languages). A number of different areas are being affected, such as the degree of multi-skilled knowledge (e.g. electrical, mechanical), the need for re-skilling as new techniques are introduced, the timing and breadth of courses and training, and the way in which training is delivered. This growing demand for skilled workers is especially significant for suppliers, who have taken more responsibility in areas such as design and development, as car manufacturers continue outsourcing to the supplier industry.

Currently, up to 75% of the value of the car comes from the suppliers, and an increasing amount of technology in vehicles today is developed by suppliers, such as ABS, Electronic Stability Programmes (ESP), airbags and navigation systems. The company who wants to be successful in this new environment will have to create a faster, smarter and better organisation, and this requires a highly productive workforce.

The issue of attracting and retaining employees with the right level of skills in the automotive sector has long been a prime concern for the industry. The European automotive industry is losing competitiveness partly due to the lack of skilled labour to fill open positions. The imbalance between the supply and demand in the educational system in many countries across Europe is contributing to a mismatch in the labour market, which is also felt in the automotive sector.

Through this White Paper on education, training and learning, CLEPA seeks to give impetus for dialogue and joint work on education and training between all stakeholders, to improve the competitiveness of one of Europe's largest industries. CLEPA wishes to call for a stronger emphasis on, and commitment to, education, training and learning throughout Europe, at all levels. Meeting this challenge requires improved cooperation between industry, national governments, trade unions and the European institutions, and more extensive use of EU-wide programmes, as independent national actions are no longer enough to counter problems facing the whole continent. Moreover, it includes reform of primary, secondary and tertiary education, changing curricula and introducing new courses and methods, as well as starting pervasive awareness campaigns on the necessities of, for instance, lifelong learning. Meeting this challenge also includes a stronger focus on vocational training, continuous teacher and trainer education and exchanges with industry, as well as more initiatives and incentives for on-the-job learning, in order to create a culture where lifelong learning is not only a guiding principle, but also an attractive part of life. The public authorities (education and research, notably) and the automotive industry need to work together to identify the most pressing needs and implement the solutions to them. Many good examples already exist in Europe, and they should be followed, not merely applauded. This way we can sustain and improve the competitiveness of the European automotive industry and contribute to the Lisbon goal of making Europe the most competitive and dynamic knowledge-based economy.

Investment in change today will cost Europe significantly less than the lost employment of tomorrow.

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CLEPA White Paper on Education, Training and Learning to Increase Competitiveness in the Automotive Industry

1. Introduction

The European automotive industry is a key player in the European Union today. The 'Engine of Europe' is a fitting description of the European automotive industry, not only due to its size, complexity and economic contribution, but also owing to its role in providing mobility for millions of Europeans. Human resources are the automotive industry's main asset, with an estimated 10 million workers employed in the motor vehicle manufacturing industry across Europe. Of those, approximately 8 million jobs are to be found in the automotive supplier industry.¹

In our global business climate, the potential for economic sustainability and future growth is ultimately dependent on individual competence, which can only be supplied in a society characterized by a high educational level.

Today it has become clear that the European automotive industry is losing competitiveness as challengers from lower-cost economies have increased their share of world automotive markets at the expense of the European suppliers and manufacturers. To reverse this dangerous trend, the public and private sector in Europe must, above all, seriously invest in education, training and learning for competitiveness to ensure that the automotive industry, as one of the major employers in Europe, maintains its competitive edge. Only this investment will allow the companies to continue offering jobs and income for millions of Europeans.

In the wake of the 2004 report of the European Employment Taskforce, and following the 1999 ACEA/CLEPA White Paper on education, training and learning, the CLEPA 2005 White Paper on education and training outlines the issues the automotive industry is facing in these specific fields and suggests a number of action-oriented steps to improve the situation, which at present is characterised by slow and uneven reforms in education, training and learning across a Europe reluctantly facing up to the challenges of a knowledge-based society and an ageing workforce.

While many of the initial recommendations from the 1999 White Paper remain, there is a need to look at the automotive sector in a new way. The accelerated rationalisation and globalisation of the industry, together with the enlargement of the European Union and the emergence of a new set of competitors has changed the conditions of the industry, which faces new demands of time efficiency as well as continuous technological development in the face of ferocious competition and rapid change. These challenges are proving difficult to meet for both manufacturers and suppliers, and can have devastating consequences, as in the recent collapse of MG Rover and Collins & Aikman.

The first part of this paper will present an overview of the industry, and the following sections will outline the key areas and main challenges for the automotive industry in

¹ CLEPA estimated figures for 2004-2005.

education and training, highlight some 'good practice' examples, as well as consider a number of action proposals in order to sustain a European automotive sector. CLEPA argues for improved cooperation, continuous reassessment and accelerated reform of education and training policies by *all* relevant parties, through, for instance, deduction of training costs, voluntary self-regulation, systematic involvement of interest groups, and more EU-wide programmes to complement the patchwork of national programmes, in order to maintain competitiveness and provide sustainable growth in a knowledge-based economy. Education and training must reflect the changing socio-economic and competitive framework conditions and its objective must be to create, throughout the European work population, the ability for production of high quality products and services, and innovation. Investment in change today will cost Europe significantly less than the lost employment tomorrow.

This document forms part of the work of the CLEPA Working Group on Education and Training, and has been produced by the members of the working group, representing individual supplier companies as well as industry associations and education and training companies across Europe. The paper is a result of discussions within the training group as well with other stakeholders from areas such as the vehicle manufacturing industry and trade unions. CLEPA wishes to thank all those who contributed to the project through interviews and providing materials.

2. Strategic objective

The main objective of this policy paper is to stress the importance of continuous education, training and learning for competitiveness of one of Europe's largest industries. Mobilising resources for competence development is a shared challenge. CLEPA seeks to provide impetus for dialogue and joint work on education and training needs between all concerned parties in the EU25, with the objective of ensuring the survival of the European automotive industry in Europe, and hence the jobs and incomes of millions of Europeans, whilst contributing to the Lisbon goal of making Europe the most competitive and dynamic knowledge-based economy in the world.

Competence development and continuous investment in education and training must be a priority on *all* stakeholders' agenda. While there currently is a positive trend in the EU towards devoting more funds to Community education and training programmes, the global competitive climate is making it increasingly difficult for European automotive companies to sustain their education and training budgets. It should be stressed that there is a strong case for employers to invest in their workforce in light of the substantial returns gained in terms of productivity, competitiveness and efficiency. The industry has not sat idle, but although progress has been achieved by all key actors on education, training and learning issues over the past six years since the initial 1999 ACEA/CLEPA White Paper on education, training and learning, there are still major deficits in important areas, such as key competences and lifelong learning, which have to be dealt with urgently. Therefore, the CLEPA white paper identifies some of the most pressing issues and needs in education and training for the European automotive industry and proposes a diverse range of actions to meet these challenges. It will be used extensively to communicate these issues to all relevant stakeholders at European, national, regional and local level.

3. Overview: the European automotive industry

3.1 The strategic importance of the industry

The European automotive industry is a vital part of the European economy and the largest employer in the European industry portfolio. According to figures published in the European Commission's European competitiveness report 2004, 2.13 million workers were employed directly in the manufacture of motor vehicles and components in the EU25 in 2002.² In terms of employment, these figures are grossly underestimated. In real terms, the figure for employment in the motor vehicle industry, including both manufacturers and suppliers, is assessed to be closer to 10 million employed, with European automotive suppliers alone employing approximately 8 million people over ca 5000 companies.³

Further, automotive businesses are leaders in global best practice in many areas of manufacturing, purchasing, product development and logistics, and the skills and knowledge of the industry provide a key source for improvement throughout the whole manufacturing sector. The automotive sector, and especially Toyota, pioneered lean manufacturing which has come to be recognised as an over-arching solution to many of the ills of traditional manufacturing. Sectors ranging from retail to healthcare have learned and benefited from the automotive industry and their lean practices. For instance, in the UK, the automotive industry has worked together with the aerospace industry, using the same approaches as have been tried and tested in the automotive sector. Telecoms have also learned from the automotive industry, applying approaches such as cellular manufacture.

The automotive industry is also a major driver of new technologies. In 2000, roughly 19% of all R&D in manufacturing was undertaken by the automotive sector, and in Germany alone, R&D expenditures by car manufacturers accounted for more than 30% of the total domestic R&D expenditures in manufacturing.⁴ Moreover, because the automotive industry acts as systems integrator of a number of important industries, including the chemical, electrical and electronic parts, steel, glass and textiles sector, most of the education and training issues, which concern the automotive industry are also relevant to many other industries.

3.2 Global competition

In total, Europe is the second largest producer of motor vehicles after the Asia-Pacific area, in terms of passenger vehicles, light and heavy trucks. Divided into market segments, Europe is the world's largest producer of passenger cars for the world market, with a share of 42%, followed by Asia-Oceania with 35% and America with 21%. America produces the largest share of trucks for the world market with 56%, followed by Asia-Oceania with 30% and Europe with 14%. China dominates the bus sector, producing 70.3% of the world market, followed by South Korea, which has an output of 14.3%.⁵

Over the past decade, competition in the automotive industry has intensified on a worldwide scale. The competition from areas such as Asia-Pacific, including Japan and Korea, and North and South America, as well as from emerging competitors Russia, India,

² Pp 157, European Commission (2004) *European Competitiveness Report 2004*

³ CLEPA estimated figures 2004-2005.

⁴ Pp158, "European Commission (2004) *European Competitiveness Report 2004*

⁵ Pp 160-162, European Commission (2004) *European Competitiveness Report 2004*

China, and the Middle East is becoming increasingly felt by the European automotive industry. Today there is widespread evidence that the European automotive industry's competitive position is rapidly worsening due to competition from lower cost economies. China and India in particular offer an alarming challenge, with rapid growth and bigger domestic consumer markets. Manufacturers and suppliers are constantly under pressure to remain competitive in price, as well as in technology. Recent figures show that Asia was the most successful region in 2003 in terms of growth, with China as the major growth market in the region, providing an important stimulus for the Asian economies.⁶ The sales volume in Asia continues to expand at a fast pace, with the majority of the vehicles sold there being produced locally. Further, Asia continues exporting to, in particular, Western Europe, causing an even fiercer competitive climate.

Because there is little sign that this trend will change in the foreseeable future, a concerted effort has to be made to make sure that the European market position does not worsen, and that the European automotive industry can remain competitive in the borderless automotive economy. The EU candidate countries and the new EU member states have emerged as a great production opportunity for the European Automotive industry. As well as new markets, these countries offer lower labour costs (only some 20% of total added value of a product are wage costs), longer working days (ca 40 hours per week), the availability of a skilled workforce, and 'green-field' labour relations. This has led to an increasing amount of vehicle manufacturers opening new assembly plants in the Central and Eastern European Countries (CEECs), with corresponding developments taking place in the supplier industry. The most appealing destinations for suppliers are the Czech Republic, Hungary, Ukraine, Slovenia and Bulgaria. According to a study carried out by Ernst & Young, one in three German suppliers have operations in Eastern Europe and this figure is expected to rise to 39% in the near future.⁷ The sustainability of the advantages the CEECs hold will depend on choices made by the CEEC governments, not only in the sectors of fiscal and social policies but also in education, research and development. Examples from Scandinavian countries and the UK show that good overall economic performance can be achieved with greatly different social and fiscal policies. Investment in research and technical and skill development is, however, indispensable. This applies to CEECs and western European countries alike. As welfare spreads, labour costs rise and other advantages need to be created to compete. Being relatively "young" open economies the CEECs should try to benefit from the advantages of their leaner legal systems and high compatibility with EU's regulatory framework. This will not be self-evident as they face political pressures both from inside and outside. Nevertheless, it should be kept in mind that the number of jobs created in the CEECs (some 160 000) is still significantly smaller than in Western Europe. In terms of production, one in every five German cars is produced in Eastern Europe.⁸

⁶ Pp 34, Verband der Automobilindustrie (VDA) (2004) *Annual Report 2004*

⁷ Ernst & Young Study (2004) *Automotive Manufacturing in Western Europe Under Threat?*

⁸ Ernst & Young Study (2004) *Automotive Manufacturing in Western Europe Under Threat?*

3.3 Rapidly changing environment

Over the past decade, the European automotive sector has shifted from an industrial to a knowledge-based industry. The conditions of the industry have radically changed due to technological advances, production automation, legislation and regulation such as the Block Exemption and Design Directive, mounting overcapacities, soaring raw material prices and competitive global markets. From being a low-skilled sector, the automotive industry is gradually changing to a more high-skilled labour force, especially with regard to the increased emphasis on research and development, and engineering. The European Industrial Relations Observatory has pointed out that, with progressively more sophisticated vehicles and rising investment costs, the optimum economic scale increases. Companies have sought to achieve economies of scale by standardising parts across their model ranges, producing more models from fewer platforms.⁹ Meanwhile, the modern car also has to meet the needs of the consumers, who often expect ever-increasing levels of customisation, comfort, and safety features in increasingly fuel-efficient vehicles.

The increasing sophistication of vehicles and production requires an increase in both basic competences and new skills. A number of different areas are being affected, such as the degree of multi-skilled knowledge (e.g. electrical, mechanical), the need for re-skilling as new techniques are introduced, the timing and breadth of courses and training, and the way in which training is delivered. The growing demand for skilled workers is especially significant for the automotive suppliers, who have taken more responsibility in areas such as design and development, as vehicle manufacturers (VMs) continue outsourcing to the supplier industry. Manufacturers are moving toward a systems-oriented approach in which a limited number of system suppliers or system integrators – with design, engineering, and other advanced capabilities – supply preassembled and tested modular systems, delivered (just-in-time and just-in-sequence) directly to the VMs. Manufacturers expect these system suppliers and integrators to coordinate both internal and external product development activities with their own supply base. As a result, up to 75% of the value of a car now comes from the suppliers, bringing in technology such as ABS, Electronic Stability Programmes (ESP), airbags and navigation systems. Therefore, the knowledge that formerly has been required at the vehicle manufacturing level has now both increased and moved down the supply chain, and suppliers need to be more technically adept than ever before. Overall, product cycles are shorter and the need for innovation greater. In 1990 it took six years to go from concept to production in the automobile industry. Today that process takes just two years¹⁰. However, the pressure to innovate can be difficult to manage, especially for the SMEs, as they find it tough to meet the costs of innovating activities.

The change process in the automotive industry has also called for an introduction of new working structures. The move to 'lean manufacturing' has over the past decade brought about major changes in working practices and organisation at all levels, and has been one of the main factors driving change in the skills and knowledge that people need to do their job. With cost reduction and lean manufacture, the automotive industry has moved away from traditional forms of "job individualism" towards a more flexible work structure, emphasising the ability to work in different teams on different projects as well as the need for multi-skilling on the shop floor. The rate of technological change has raised the skill

⁹ Pp7, European Industrial Relations Observatory (2004) *Trends and Drivers of Change in the European Automotive Industry*.

¹⁰ Pp2, World Bank Publication (2003) *Lifelong learning in the global knowledge economy: challenges for developing countries*.

requirements of most jobs and placed a premium on flexibility. Flexibility in labour deployment can only be ensured through training to acquire additional knowledge and abilities.

The industry is introducing new education and training concepts to help managers and team members in different departments to develop and coordinate solutions that are flexible and cross departmental boundaries. On-the-job learning and the concepts of continuous job and site rotation are modes of training, which can enhance flexibility, providing a wider perspective. In some cases, multi-sites have been set up to enhance the quality and transferability of supplied goods and services through harmonizing learning contents and delivery, to arrive at the same set of skills to produce to the required customer specifications. However, flexibility must not compromise quality and solutions have to be found to manage the contradiction between the demand for company-specific qualifications and flexibility, on the one hand, and market-related, universal flexibility and mobility on the other hand.

3.5 Human resources implications

As a result of the transformation to a knowledge-based industry, there is a clear trend towards only recruiting people with at least secondary education, also for those occupational groups traditionally referred to as “low-skilled”. This means that jobs that previously did not demand more than basic skills now require a certain level of literacy, numeracy, language and IT skills. For instance, the role of receivals, stores and despatch and supply chain logistics in the supplier industry has intensified in workload and complexity, becoming increasingly high-tech and time pressured due to time-to-market measurements and just-in-time and just-in-sequence delivery. Accuracy is key and employees need to be familiar with electronic integrated management systems as booking in of parts and materials becomes progressively more computerized.¹¹ It should be noted that this change in skill needs is not only restricted to what used to be the “low-skilled” jobs, but is prevalent across the entire spectrum of occupational groups in the automotive supply chain.

The issue of attracting and retaining employees with the right level of skills in the automotive sector has long been a prime concern for the industry. The European automotive industry is losing competitiveness partly due to the lack of skilled labour to fill open positions. The imbalance between the supply and demand in the educational system in many countries across Europe is contributing to a mismatch in the labour market, which is also felt in the automotive sector. If this trend continues, it will be difficult for the European automotive companies to maintain sustainable growth and jobs across Europe. Instead, investments, factories and employment opportunities will be moved to competing markets outside of Europe, where education policy is less rigid and where there is more practical orientation, and closer contacts with industry. This trend has already begun, with both European suppliers and manufacturers moving production, *as well as* research and development centres to, for instance, India and Brazil, where the quality of knowledge is, at the least, the same as in the EU, paired with lower labour costs. As an example, Bosch already employs 3000 engineers in Bangalore, India.

¹¹ Skills4Auto (2004/2005) *Study on Skill Gaps in the Automotive Supply-Chain in the West and East Midlands*.

The slow pace of reform in education and training across Europe is not only a direct human resources problem for the automotive industry, it also has immense repercussions on Europe's economy and competitiveness overall. The automotive industry is not alone in its position, nor is it secluded from the rest of industry. As the automotive industry becomes more knowledge-based, with a stronger emphasis on accuracy, requiring more skilled employees, the competition for skilled labour among the different industries in Europe will also intensify.

3.6 The importance of education and training for growth and competitiveness

Competitiveness in the European automotive industry largely rests on three factors: price, innovation and quality. Since it is difficult for the European automotive industry to compete solely on the basis of cost, the competitiveness of the industry will therefore depend on the companies' capability to put forward innovative products and high quality, technically advanced solutions for products as well as for production and development, while being at the cutting edge of marketing and distribution. Hence, it is essential to have a well-trained, skilled and motivated workforce. This, in turn, will be determined by the quality of education, training and learning.

Human resources are central to the creation and transmission of knowledge and a determining factor in the European automotive industry's potential for innovation. Personal and professional development supports flexible deployment of skills in a borderless automotive economy. Employees in most industries are increasingly required to demonstrate significant judgement and flexibility, while maximising performance and improving productivity. But to become more efficient and competitive, people need the right skills and therefore to be better trained, more innovative, more customer focused and more determined. This can only be done through education and on-going development (so-called 'lifelong learning') and through rewarding people who are willing to change inside the organisation and learn new skills. The Employment Taskforce has pointed out that "workers, if they are to remain and progress in work, need to accumulate and renew skills regularly" and that the "productivity of enterprises, and the overall competitiveness of our economy, is directly dependent on building and maintaining a well-educated, skilled and adaptable workforce that is able to embrace change".¹²

Crucially, companies as well as educational bodies need to, first of all, be able to identify the new competences needed in the industry as well as retain and pass on the tacit knowledge of older workers, to remain competitive. Enterprises are generally more aware than public organisations of their own specific skills needs and are thus more capable of designing efficient, relevant training that meets their requirements. Yet, many companies do not invest adequately in training because they are not fully aware of the benefits, or do not realise the risks of not maintaining the skills of their staff.¹³ Little or no investment in training and learning will lead to negative consequences for most parts of the industry, as the company who wants to be successful and survive in a highly competitive, global economy will have to create a faster, smarter and better organisation, and this requires a highly productive workforce.

¹² Pp 10, European Commission (2003) *Jobs, Jobs, Jobs - creating more employment in Europe" Report of the Employment Taskforce, chaired by Wim Kok*

¹³ Pp 50, European Commission (2003) *Jobs, Jobs, Jobs - creating more employment in Europe" Report of the Employment Taskforce, chaired by Wim Kok*

3.7 Skill scarcities

Currently, the deficiencies in basic skills and key competences are the main factors leading to poor quality control, lost orders and miscommunication with customers. The sector's main skill scarcities are 'soft' skills and technical skills at all levels, which poses varying degrees of problems for companies often depending on their size. Larger businesses tend to have an easier time recruiting highly skilled graduates, and further handle part of their skill requirements through graduate training and extensive apprenticeship programmes. For instance, many companies such as Valeo and Bekaert put their graduate recruits through up to two years of training in order to specialize their skills and create a business awareness, so that they can better understand their role and relate it to the business and manufacturing. The industry is complex, and there is a need to retain people for several years to build sufficient understanding, and with differentiating technologies, it takes time to build skills. This challenge can be met through more widespread cooperation between industry and schools and universities. Currently, the nationally oriented education policies constitute part of the problem, as they do not serve the needs of the international industry sector well.

Skills shortages particularly pose a problem for the smaller companies in the supply chain, who form a significant part of the automotive supplier base. Many of the small and medium sized enterprises (SMEs), which depend on multi-skills, tend to find recruitment difficult and, with lean production, have little spare capacity to engage in training programmes. Often in smaller companies there is no back up for the person who goes away on training. Also, soft skills, such as communication skills and project management skills are problematic for SMEs, while these skills are not widely taught in schools or universities, and because most of the time they cannot recruit or train, for instance, professional buyers. In particular, the producers of single components have difficulties in finding the resources and skills to innovate, and together with that they often lack the scale to address the high volume requirements of standardisation, their scarcities make them particularly vulnerable to competition from lower cost countries outside Europe. It is especially the most vulnerable companies who need help to invest in education and training, and support from an educational system which recognises their needs. Ultimately, an increase in the competence supply in the labour market and improvement of quality in the field of education and research is imperative to retain a competitive automotive industry in Europe

4. Education, training and learning and the automotive industry

In the global economy of the 21st century, investment will locate where human ingenuity and know-how will provide the strongest return, therefore we must continually invest in enhancing the intellectual capital of Europe. This involves not just focussing on cutting edge programmes at the post-graduate level, but providing the highest quality education at the primary and secondary levels, along with effective remedial programmes. There are new tasks for schools and universities as knowledge is being developed and applied in new ways. Educational systems can no longer emphasize solely task-specific skills but must also focus on developing learners' decision-making and problem-solving skills and teaching them how to learn on their own and with others. Just as business is investing in technology to enhance quality and effectiveness, so too should the educational sector invest in new technology and methods of delivery to enhance the accessibility and performance of the system.

In a knowledge-based industry such as the European automotive industry, a number of basic competences are required, whether personal (e.g. problem-solving, team working, customer care), technical (e.g. Information and Communication Technologies), or theoretical (e.g. mathematics, foreign languages). Already in 1999 in the ACEA/CLEPA white paper on education and training, the automotive industry stressed the need for EU member state governments to ensure that every young person in Europe leaves the education and training system qualified and skilled with a basic understanding of mathematical, scientific and technical disciplines, as well as competences, ranging from social and communication skills to methodological and analytical skills. The Employment Taskforce in their report of November 2003 has since reiterated this.¹⁴ It cannot be stressed enough that this remains one of the basic prerequisites for competitiveness and sustainable growth within the EU.

The following section focuses on education at all levels for the automotive industry.

4.1 Basic Education

The skills required in a knowledge-based society need to be implemented from the beginning of education, in order to be utilised throughout life. Students need to take with them a better sense that learning will be a part of whatever jobs they have – for a lifetime. Primary and secondary education play a vital role in laying those foundations, teaching the new competences required to make Europe – and hence European industry – competitive on a global market, instilling a culture of lifelong learning.

The competence most important for the automotive industry is scientific and technical skills. Currently, too few students are choosing technical streams in school, which creates an imbalance in supply and demand of skills needed in the manufacturing industry. Attracting the right level, and experience of, process and technical skills is proving difficult for the industry. Moreover, the science available in school is often detached from everyday life and work experience. Better links are needed with the real world of science and there is an urgent need for efforts to be made by national governments and the European Union institutions to ensure that science and technology is promoted as a viable choice for young people in school, leading to careers in sectors at the cutting edge of innovation and design. This is especially relevant as regards promoting gender equality and getting more young women into technical and engineering professions. As pointed out by in the High Level Group on Human Resources for Science and Technology appointed by European Commission in their 2004 report “Increasing human resources for science and technology in Europe” more hands on experience is necessary especially in primary and secondary level courses, which should be designed to meet the interests of young people.¹⁵

Scientific and technical skills

Scientific and technological development is fundamental for the competitive knowledge society and all citizens need a basic understanding of mathematics, science and technology. The automotive industry in Europe is especially dependent on a workforce with scientific and technological skills with everybody thinking about how to retain the

¹⁴ European Commission (2003) Jobs, Jobs, Jobs - creating more employment in Europe" Report of the Employment Taskforce, chaired by Wim Kok

¹⁵ European Commission (2004) *Report by High Level Group on Human Resources for Science and Technology appointed by European Commission: Increasing human resources for science and technology in Europe*

competitive advantage that comes from quality and innovation. For example, as a result of a recent global needs assessment conducted by General Motors, the corporation again emphasized the employees' level of technical knowledge as a necessity for a stronger market position.¹⁶

Scientific and technical skills need to be present throughout a business in the automotive sector. Technical expertise in processes and equipment, and knowledge of materials, as well as the ability to acquire new learning as these change, are imperative skills both in the design room as well as on the shop floor. Manufacturing technicians are key in making it possible, for instance, for the automotive supplier to meet more stringent customer expectations, and to reduce the cost base through productivity, quality and reliability improvements. Overall, the technician's role is increasingly a more responsible and complex one, with a growing need for a higher calibre of employee.¹⁷ Moreover, while engineers and manufacturing operators need advanced technical knowledge and skills, sufficient technical know-how is also important for sales, marketing and purchasing staff to understand the technicalities of the parts they promote and purchase. As there is a growing need for a more widespread understanding of scientific and technical knowledge and skills throughout an organisation, the bar is raised for what constitutes sufficient scientific and technical literacy at primary, secondary and tertiary level.

Considering the relative lack of students choosing technical and engineering educations, and the inability of today's career guidance to gauge skill requirements for the future, more cooperation between governments/public institutions and the industry in education and training is urgently required to stimulate interest in science and technology among school children. Initiatives have been taken in, among other places, the UK by the Department of Trade and Industry's Automotive Unit and the automotive industry to engage school pupils in engineering and manufacturing. Whether it's a company visit, competition or event such as the annual Imagineering Fair¹⁸, these all offer an insight into the world of engineering for both students and teachers, and the varied and exciting career opportunities available. Another example of successful private-public collaboration is the Volvo cooperation with the local government in Gothenburg, Sweden, to open an upper secondary vocational school, Göteborgsregionens Tekniska Gymnasium AB (GTG), located at the Volvo plant. Every year 120-140 students are admitted to GTG to go through a 3-year programme focussing on automotive technology, taught by teachers from Volvo. The school, started in 1998, is to 49% owned by the local government, while the remaining 51% is owned by AB Volvo and Volvo Cars. Similarly, the Czech automotive industry association, AIA, initiated a project in 2003 called IQ Auto, which aims to connect its member companies with appropriate vocational and secondary schools in their region. In Germany, this type of cooperation has recently been initiated on an industry-wide scale, with nine leading German industry businesses (including automotive suppliers Bosch and Thyssen Krupp) launching the "Wissensfabrik" ("Knowledge Factory"). Pooling together companies of

¹⁶ Chalmers University of Technology, News Summary, <http://chalmersnyheter.chalmers.se/Article.jsp?article=3958>.

¹⁷ Skills4Auto (2004/2005) *Study on Skill Gaps in the Automotive Supply-Chain in the West and East Midlands*

¹⁸ 'Imagineering' is a varied engineering and manufacturing event with many hands-on activities suitable for different ages. The event attracts upward of 50,000 visitors each year. The initiative for Imagineering came from members of the Institution of Mechanical Engineers and the Institution of Electrical Engineers in the Midlands, concerned by the increasing shortage of qualified, skilled engineers of all disciplines across a wide spectrum of manufacturing industries. It has won the support of many UK manufacturers and organisations, including BMW, Caterpillar, Delcam, IMI, Jaguar, the National Grid, Sandvik and TRW Lucas.

different sizes and from different sectors, the "Knowledge Factory" aims to improve education in Germany and thereby strengthen German industry's global position. The campaign is based on concrete actions to enhance Germany's competitiveness in terms of know-how. For 2005 this means that each participating company has committed itself to cooperate with neighbouring schools and other institutions with the aim of promoting reading, writing and technical competence as well as a better understanding of technical and economical matters. This type of cooperation is imperative for the future of the automotive industry in all countries across Europe and national governments and industry alike should make sure that similar projects are undertaken in their countries. These initiatives can also be supported through awareness campaigns undertaken at EU level, aimed at primary and secondary education, underscoring the possibilities and opportunities available through scientific and technical studies.

4.2 Tertiary education

Given that the higher education sector is situated at the crossroads of research, education and innovation, it is of particular interest to the automotive industry, which views it as key to the competitiveness of the sector.

Currently, many of the automotive suppliers across Europe consider it problematic that university graduates do not have the 'right' scientific and technical skills to match industry needs when they enter the labour market to work in a sector that has to be at the cutting edge of technology and innovation. In addition, many universities in Europe do not teach their students the key 'soft' competences required in industry today, ranging from communication skills, to team-working and knowledge of how to plan business. These skills are imperative in industry and must be incorporated into course curricula. Meeting industry needs in skills and knowledge will only be done through more widespread cooperation and exchange between industry and tertiary education, so that the transfer of knowledge and ideas can be ensured in both directions. Further, regarding science and technology, universities should ensure that courses for *applied* science and technology are available, since most science and technology positions in the automotive industry are application oriented.

Raising education and research standards at national level consequently also requires more resources, and therefore, for instance, a higher percentage of the various member states' GDP should be allocated to education and research. The Finnish state enterprise Senate Properties set an example of investment solutions, borrowing €50 million from the European Investment Bank (EIB) in May 2005 for the construction of new higher education and research facilities in Finland, and the extension and upgrading of existing infrastructures.

Ventures between tertiary education providers and the automotive industry are becoming increasingly important. An example of good practice in this area is the French Mecatronique programme, launched in September 2003, which is a contractual partnership between the Yvelines Institute for Science and Technology (ISTY), the Centre for the Formation of Engineering Apprentices (Le Centre de Formation de Apprentis Ingenieurs – CFAI) and FIEV (the French industry association for automotive suppliers), and is aimed at integrating three distinct technological branches in the automotive sector – mechanics, electronics and computing - with practical business application. The three-year programme offers students the opportunity to gain practical experience with companies while studying, as well as a mentor within the company who acts as a constant point of

contact. The purpose is to provide not only scientific and technical skills, but also communication skills, which are imperative in the automotive industry. The graduate apprentice receives a diploma from the 'Commission du Titre d'Ingenieurs' (The French Society for Chartered Engineers).

For years the EU countries have lacked the will to set up a single framework for education and training similar to the EC Framework Programme for R&D. Not surprisingly, the European educational scene remains quite fragmented despite the often-positive impact of programmes such as Leonardo da Vinci and Erasmus. Yet, change is underway as the new Integrated Action Programme for lifelong learning will start in 2007. A noticeable increase in funding is foreseen (ca 13 billion over 7 years) - pending approval by the EU Council of Ministers in the difficult negotiations over the financial perspectives for the Union. One challenge for these two programmes will be to create a logic continuum from early stages of education all the way to research and working life. Until now, synergies have been insufficient both on EU and national levels to alleviate the skill shortages facing the automotive sector among others.

4.3 Vocational training

Vocational training was for a long time pushed to the sides and saw fewer applicants when university expansion took place, but has remained a valuable source of training and education in the European automotive industry. Although vocational training is important for all enterprises within the sector, it is especially central for SME employers, who value vocational training extremely highly and require a workforce with more vocational qualifications.¹⁹ Nevertheless, vocational training is not promoted equally with university education in many countries, and the teaching of entrepreneurial skills is widely neglected. CLEPA would like to emphasize in this context the importance of creating special vocational "automotive" courses and educations throughout Europe, as has been done at secondary school level by, for instance, Volvo and local government in Goteborg, Sweden (mentioned above). Such education should not be limited to the specific company colleges that exist, but should be widely available to those who wish to further their knowledge and gain a recognised qualification in automotive technology post secondary level.

Vocational training needs to be made more accessible, and should be improved by stronger practical orientation. For example, some countries across Europe have caps on age for funding eligibility, which need to be removed in order to provide broader access to this type of education and training.²⁰

In terms of further and on-going vocational training, the recognition and validation of non-formal learning and on-the-job learning is especially vital for European SMEs and their employees, as this is their main tool for the development of competencies. Therefore it is necessary that a system be set up where competencies and vocational experience acquired by employees on the job can be certified. While it is clear that competence goes beyond qualifications, a system which recognises these qualifications would facilitate

¹⁹ The European Association of Craft, Small and Medium-sized Enterprises (UEAPME) has pointed out that small businesses usually have to pay more for training than large companies and the content and delivery of formal training is usually not tailored to the needs of SMEs. Smaller companies also have particular difficulties in accessing quality information, guidance and funding for training. Therefore, vocational training is very important to this group. (Policy Fact sheet n°3, Vocational training and Lifelong learning on www.ueapme.com)

²⁰ Policy Fact sheet n°3, Vocational training and Lifelong learning on www.ueapme.com

employment processes for, among others, SMEs as well as enhance labour mobility for individual citizens.

Organising apprenticeships is another way for companies to make sure they can secure employees with the right vocational skills, but for many businesses the costs of putting young people through advanced apprenticeships mean real sacrifices elsewhere. In the automotive industry many of the larger enterprises, such as Webasto and Mann+Hummel, run apprenticeship programmes. Although for some companies it may not always be easy to find good apprentices with knowledge of, for instance, milling, turning and welding, the need for process skills in the industry needs to be addressed, and could be done through the expansion of apprenticeship programmes and increased vocational training. Apprenticeship not only contributes to reducing unemployment amongst young people, it also contributes to the development of entrepreneurship among the younger generation and ensures the continuity of craft trades and SMEs. Apprenticeships must therefore be further promoted and supported at national and European level through, for instance, apprentice scholarships for young people and training tax credit systems, where a certain percentage of wages for an apprentice in a qualifying skilled trade would be refunded, making it easier also for SMEs to take on apprentices. On an industry level, companies should treat apprentices as potential future employees, and not as reduced labour. This way, trained apprentices are more likely to stay on in the business, returning on the investment made by the employer.

4.4 In-company training establishments and company colleges

Many of the larger companies in the automotive industry, such as Delphi and Bosch complement the knowledge of their graduate recruits through up to 2 year long graduate training programmes, which aim to provide them with in-depth learning from real experience. Graduates can in this way develop their technical and commercial skills through a number of projects that will give them extensive experience of the automotive business. No graduate can contribute to the business unless the business is understood, and this is primarily done through the sharing of knowledge with existing professionals in the organisation, often backed up by management training from external experts and consultants. However, as pointed out before, the setting up of in-company training establishments does not constitute an option for many SMEs, where the lack of time to train, finding substitutes for those training, and the cost of training remain obstacles difficult to overcome.

Other companies have started their own colleges. In order to provide their business with the right level of skills, Skoda Auto has established their own Skoda Auto College, which is a private tertiary, non-university school with a trade-specific academic baccalaureate programme. The aim is to educate highly qualified specialists in the field of operation management in engineering and marketing and the programme includes traineeships at Skoda Automotive or within the Volkswagen Group, and job opportunities at Skoda Auto after graduation.

In a bid to foster the culture of continuous learning and to ensure that employees remain updated on skills and competences, some companies have also set up in-company training for experienced employees. GKN has developed the GKN International College of Engineering (ICE), inaugurated in 1990, which provides a specialized training ground for medium to senior levels of engineers and professionals in other functional areas, covering their needs in carrying out their technical and management roles. Similarly, Faurecia has

set up Faurecia University, which develops and implements training programs designed to enhance the development of managers and professionals, as well as specialist skills. The training program aims to ensure the success of the organization's core businesses and plays a leading role in building a strong corporate culture. Faurecia University provided over a million hours of training in the Group in 2004. Such platforms bring together the collective experience amongst employees for sharing and cascading, and moreover, not to reinvent the wheel with regard to problem solving.

The car manufacturer Ferrari also runs a very successful and all-encompassing education and training scheme for all their employees. The main programme, Le Rotte della Conoscenza (the routes of knowledge) has 28 different courses divided into 5 main areas, covering shop floor to top management. Overall, the Ferrari programmes have a very high rate of participation in all education programmes, including those courses which are paid for but undertaken during the employee's own, un-paid time, such as e-learning and English language courses. Through these courses, covering all aspects of work at Ferrari (and the perceived attractiveness of the brand), the company is helping to instil a culture of lifelong learning and thus managing to keep the updated and skilled workforce they require for their products.

There is also collaboration between the industry and universities aimed at educating and training those already working in a company. Recently General Motors identified continuing education from the world's highest ranked universities as an important factor for strengthening the company's technical knowledge and ensuring competitiveness in the industry. GM initiated a partnership with Chalmers School of Technology in Sweden in 2002, and through completely web-based courses from Chalmers School of Continuing and Professional Studies, GM's engineers have been able to strengthen their knowledge in fields such as safety, the environment and materials worldwide. GM has emphasized this type of web-based education as a model for its other university partners to adopt.²¹

4.5 Partnerships

The challenge, especially for SMEs, to reach a competitive level in science and technology, as well as in other skills, can be met by establishing partnerships between governments and industry, and in particular the industry associations. Such a 'good practice' example is the industry-led Automotive Academy in the UK, which promotes world-class training for people at all levels in the UK vehicle manufacturing and its supply chain. Established as a partnership between Government and industry, the Academy promotes globally competitive standards of training and skill development throughout the UK's automotive industry and has been created with the backing of up to £12 million (approx €17.7 million) of Government funds through the Department of Trade and Industry. As an integral part of the UK Society of Motor Manufacturers and Traders (SMMT) and a sister company to Industry Forum, the Automotive Academy is perfectly placed to increase the level of skills throughout the whole industry.

Initiatives similar to some of the tasks undertaken by the Automotive Academy are also underway in, for example, Sweden, where money from the European Social Fund (ESF), Objective 3, is being sought to help encourage skills development, competence and employability in the automotive industry. The Objective 3 programme aims to contribute to

²¹ Chalmers University of Technology, News Summary, <http://chalmersnyheter.chalmers.se/Article.jsp?article=3958>.

speeding up change and renewal within working life. The purpose is to give individuals the chance to develop their competence to match the demands of working life today. The ESF can play a key role in promoting employment and growth, and should be used more to promote cooperative projects in education and training in the automotive industry. However, issues have been raised among the members of some of the national automotive supplier industry associations regarding the rather complicated and long application process. Especially some smaller companies find that they do not have the capacity to apply for ESF funding, and therefore in the end, decide to refrain from doing so. This is a problem which must be dealt with by the European Commission as well as the national and regional authorities who administer ESF grants, as they need to ensure that the money reaches those companies most in need.

4.6 Research and Development

Being intelligent and competitive in the automotive industry hinges on technology, and technology, in turn, is reliant on research and development. Therefore, it is absolutely vital for the European automotive industry to have a well-trained workforce to go into research and development within the sector if it is to remain competitive.

Research has to be an attractive option both in the private sector as well as in the public sector, to reach better results overall in the R&D community in Europe. As most employment opportunities for researchers are created by industry, it is important that industry works towards improving conditions for the development of research. However, the level of public funding per researcher in Europe, which is clearly well below that of the US²², also needs to increase in order to create more and better research. Further, it is important to ensure that those already in scientific and research professions find their careers, prospects and rewards sufficiently attractive to keep them there. In addition to allocating more national resources to education and research as mentioned above, the European Commission's 7th Framework Programme will also play an important role for European research in the coming years. This edition of the programme will bring back a specific theme on transport with a budget of €5.9 billion in addition to themes such as ICT that address technologies used widely by the automotive industry.

The research agendas developed by the European technology platforms such as ERTRAC (European Road Transport Research Advisory Council) support the need to take a new "transport systems" perspective that considers the interactions of vehicles, transport networks and the use of transport services, which can only be developed at European level. RTD costs in all these fields are rising substantially and collaborative activity at EU level is essential to enable a "critical mass" of diverse RTD providers to address the scale and multidisciplinary challenges in a cost-effective way, as well as meeting the political, technological and socio-economic challenges on issues such as the "clean and safe vehicle" of the future interoperability and intermodality, safety, capacity, security and environmental impacts in an enlarged Union.

In principle, CLEPA supports this approach. However, considering that the budget of €5.9 billion will be divided among various modes of transport, its impact will depend on the share the road transport receives. The EC and member states should recognise the fact

²² Pp 180, European Commission (2004) *Report by High Level Group on Human Resources for Science and Technology appointed by European Commission: Increasing human resources for science and technology in Europe*

that road transport accounts for the majority of passenger transport and cargo. This must be reflected when deciding the budget for this section.

Faced with an increasing competition in the internal market and globally, European SMEs need to increase their knowledge and research intensity, expand their business activities to larger markets and internationalize their knowledge networks. Most member state actions relevant to SMEs do not encourage and support trans-national research cooperation and technology transfer. Actions at EU level are necessary to complement and enhance their impact of actions undertaken at national and regional level. In the 7th Framework Programme research for the benefit of SMEs is estimated at €1.9 billion. These financial means will be allocated through two schemes: Research for SMEs (to support small groups of innovative SMEs to solve common or complementary technological problems) and Research for SME associations. Participating in European projects gives much needed contacts, stimulates exchanges of best practices and innovation that single companies or researchers might not afford to acquire alone.

4.7 Collaboration through industry associations, clusters and transnational projects

A knowledge economy needs efficient innovation systems of firms, research centres, universities, consultants and other organisations to tap into the growing stock of global knowledge, assimilate it and adapt it to global needs, and create new technology. In the automotive industry there is a growing number of such systems, in varying shapes and sizes. The limited resources of the automotive SMEs to set up in-house training is to certain extent compensated by collaboration between companies in projects or through more permanent arrangements such as national associations, European associations (CLEPA) and clusters. The CLEPA SME and Training Working Groups are examples of active forums for the exchange of experiences and pooling of investments on the EU level. Apart from analyzing developments in the sector they focus on SME-adaptable methods such as e-learning. As a result, their members have participated in a number of EU projects in this sector.

Clusters

Clusters vary in structure but are usually regional groupings of different companies and technology poles (universities etc) with the goal of reinforcing competitiveness of all their members. This way they differ from national associations that typically represent companies in the same sector. Successful clusters tend to integrate the whole production chain in their network (including producers, service industries and technology poles) in order to generate a flow of communication and know-how between them. Although it should be recognised that not all training and knowledge can be shared with a third party, and therefore needs to remain in-house, the collaboration through associations and clusters has proved successful for companies as well as for schools and universities involved, increasing their knowledge of the industry and the technologies applied. Examples of successful clusters in the automotive sectors are: Verbundinitiative Automobil VIA NRW (Nordrhein-Westfalen, Germany); Cluster Acstyria (Styria, Austria); AC, Automobil-Cluster (upper Austria); WAF, the Welsh Automotive Forum (Wales, UK); CISFI, Consorzio per l'internazionalizzazione, Sviluppo e Formazione delle imprese (Piemonte, Italy); ARIA, Association Régionale de l'Industrie Automobile (Nord-Pas de Calais, France); ACICAE, Agrupacion Cluster de industrias de componentes de automocion de Euskadi, (Basque country); and the Pannon Automotive cluster (Hungary).

Transnational projects in the automotive industry

For the European automotive sector, solutions are increasingly found in transnational cooperation as industries create partnerships within the EU and internationally. Transnational projects in education and training in the automotive industry are important in maintaining the competitiveness of the industry as a whole in Europe. Bringing together automotive companies who normally compete with each other, as well as other actors equally concerned with research and key learning issues, promotes the transfer of knowledge between industry and universities, between large manufacturers and their suppliers, and between social partners. CLEPA has an important role to play in the coordination of transnational projects in the automotive sector, including both manufacturers and suppliers, working towards being able to provide benchmarks and best practice within education and training for the industry through initiatives such as Learn4Auto. While there are inherent difficulties in meeting this goal due to competition, intellectual property rights, and general lack of time, it is important that the positive results that come from learning from each other in competence development and sharing best practice across borders are understood as factors which will enhance the competitiveness of the industry. CLEPA members are ready to initiate projects that bring together regional actors involved in research such as universities, research centres, industry and public authorities. One initiative could be to develop a set of instruments to address specific research activities including “mentoring” of regions with a less developed research profile by highly developed regions.

Another initiative has been the European Learning Automotive Network, ELAN 2, which just finished its second round in 2004. ELAN 2 is a project, supported by the European Commission through the Leonardo da Vinci II Programme and the partnership comprised car and truck manufacturers, major university research centres, a major supplier and a trade union, representing six European countries. The project, which follows on from a series of EU-supported projects initiated by the automotive industry over the last ten years, has focused on needs resulting from technological and organisational changes in the European automotive industry, in the context of tough global competition.

The pre-competitive research project cluster EU Five-Days Car, involving CLEPA, individual companies, universities and the European Commission, also provides a good practice example of transnational cooperation between industry, technical schools, and the European Community, which should be encouraged and spread. Although the main objective of this project is to promote collaborative European automotive R&D to maintain and strengthen the industrial competitiveness, it has had indirect benefits in supplying skills for the partners involved. The projects under EU Five-Days Car have provided a window of opportunity not only for the companies participating, but also for students and lecturers involved, sensitizing them to the challenges and cutting-edge technology in the industry, leading to changes in the course curricula and better recruitment. In this environment, the European Commission plays an important role in addressing and promoting collaborative research activities.

5. New competences for sustainable growth

The following section will look at some of the newer, ‘softer’ competences which are crucial in order to sustain a competitive vehicle industry in Europe, and addresses the need for continued professional development of teachers and trainers to ensure a well-trained workforce with skills and competences that meet industry’s requirements. It also

considers the need for a common European qualifications framework so that these skills and competences can be translated and labour mobility enhanced, and suggests a number of actions to meet these new, joint challenges.

5.1 Problem solving

The capacity to recognise and resolve problems is, today, the decisive factor, which enables individuals to adapt to the continuously changing industrial work environment. This has become increasingly evident in the automotive industry, which is characterised by "lean enterprises", where all employees, irrespective of their position, need to become more involved in company-wide problem solving and continuous improvement activities. Six Sigma is a prevalent quality and problem solving topic in automotive companies, which focuses on driving defects to a nearly non-existent level. It requires deep involvement of top executives but is also dedicated to the notion that the best solutions come from the operational level, and thus necessitates involvement throughout the organisation. Ford has developed a similar lean manufacturing tool for problem solving known as 8Ds. The focus of the approach is to use it in a team environment. Teams are to be cross-functional and include members from both manufacturing as well as design engineering. Ford's 8D approach was developed to deal with problems and discover the weaknesses in the management systems that allow the problems to occur. Increasingly, companies who practice lean manufacturing are requiring their employees to also understand the 8D and Six Sigma approach to problem solving.

Best practice in problem solving and innovative thinking needs to be defined, and more widely encouraged in the automotive industry, at all levels, and in all parts of the supply chain. Employees must learn to better manage tools and techniques for lean enterprise practice, as well as risk management and integrated loss prevention. The task for education and training systems is to increase the capacity to cooperate and to take action, and develop individual capacities to solve problems. Problem solving skills should be taught from secondary education onwards, and collaboration between universities, industry and leading edge training and consulting bodies needs to be established and supported to assist this. Real application of problem solving skills must become not just another aspect of industrial activity, it must become a normal, habitual way of life.

5.2 The ability to work in a team

Working in teams is imperative in a lean environment, not least for problem solving, and has been a positive new experience for management and workers in the European automotive industry. The goal of teamwork training is to increase employee flexibility, competence and motivation. This will result in less need for supervisory control and, as a consequence, to flattening hierarchies, establishing more efficient work and management structures. Training is as important for team members as it is for team leaders, and teamwork is as essential on the shop floor as it is among senior managers and directors. Extensive management training also naturally extends beyond the initial set of team and group leaders. Team members wishing to be promoted are required to take management training and learn and qualify to do all the jobs done in the team. For many companies teamwork is also becoming spread over different plant locations, with virtual teamwork and virtual management. This type of teamwork requires stronger skills in not only working together, but also in solving problems and conflicts of interest, as well as understanding different business cultures, and therefore puts an even stronger emphasis on this skill need.

It is becoming evident in the automotive industry that the commitment of the workforce to modern team concepts is directly linked to the quality and quantity of the training they receive. The better education and training for teamwork is, the more effective, systematic, and structured the approach will become. Therefore, there is an urgent need to make teamworking skills part of all stages of education and training, changing curricula in the education system to include additional, modernized courses, with room for internships. All through our educational life, learning is considered an individual activity. Although in the classroom we learn with others, this is not the same as learning as a team. Learning as a team involves the group assimilating new skills that are utilised together by the group, rather than just individuals acquiring new skills for their own use. Industrial life involves many situations where team learning is important, and we must encourage educational bodies to understand the difference between team and individual learning, and to promote team based learning more actively.

5.3 Information and Communication Technologies (ICTs)

New technologies applied to human performance are a key cross-industry trend everywhere, and it will become increasingly important for all citizens to be comfortable with the use of these technologies. In the modern automotive and manufacturing industry, ICT skills are needed throughout the supply chain, and across all occupational groups. Strong computer literacy is paramount when working with advanced software and programming. However, with increasing automation and computerised documentation, basic IT skills have also become necessary on the shop floor and in supply chain logistics, where lean practices and just-in-time delivery depends on increasingly computerised documentation. In essence, there are few people who will not come face to face with computers and information technologies, and therefore it is essential to ensure that the entire workforce has received IT training. One of the more interesting perspectives of ICTs in the area of education and training is the growing potential for e-learning.

e-Learning

Today, traditional training methods cannot fully meet the requirements of multinational automotive companies who need innovative methods and techniques to adapt their global training policies to the specific needs, languages and cultures of their different locations. Providing a more effective way to update employees' knowledge and skills, speedily and in numbers, is crucial to the survival of automotive companies in the current context of fierce competition and rapid changes, and e-learning is proving to be at least as effective as traditional training approaches, achieving better cognition and retention rates and ensuring speed-to-competency, while enabling results monitoring. Further, although e-learning tools have a higher up-front cost than traditional instructor led training, the cost per delivery (recurring delivery) is significantly lower.

According to a study carried out among automotive suppliers in Sweden, although knowledge about e-learning is limited, there is an increasing interest for e-learning throughout the industry, especially among the Tier1 and Tier2 suppliers. Flexibility, cost effectiveness and repetition were identified as some of the most important reasons for using e-learning. The e-learning courses that were most popular were courses in quality and project management, as well as customer specific courses.²³

²³ Scandinavian Automotive Suppliers (SAS), Mindset & Scandinavian School of Business, Economics and Law at Göteborg University (2004) *Study on Educational needs in companies within SAS*, Göteborg .

As a result of the growing need for localised e-learning content, CLEPA has, together with automotive suppliers and national automotive associations in Europe, launched the **Learn4Auto project** (www.learn4auto.com). The project is co-funded by the European Commission within the e-content programme, which contributes to the eEurope 2005 Action Plan. The objective behind Learn4Auto is to deliver effective, multilingual training tailored to the needs of automotive suppliers in a number of European countries, through a highly flexible, low-cost and “learner-friendly” e-learning web portal. Multi-lingual and multi-cultural e-learning solutions can help the automotive industry to sustain competence and skills among employees, essential to meeting the industry's demands; implement global training policies tailored to local needs; reduce education and training costs, while making education and training more flexible and efficient; make education and training available in the workplace, regardless of time and place; implement a modular approach to training, reflecting the cross-sectoral nature of jobs. However, e-learning should not be regarded as a panacea for education and training everywhere or as an automated process, but as a complement to traditional learning, which can reach a large number of employees in a short period of time.

In essence, distance learning technology has enabled companies as widely dispersed as GM to make the automotive specific, cutting-edge knowledge that is so necessary to remain competitive in the ever changing, highly competitive automotive arena available to employees throughout the world. Projects such as Learn4Auto are vital in implementing new concepts such as e-learning, and both public institutions and industry should endorse the initiatives that are found on the European level. More effort must be put into encouraging, facilitating and mobilising public and private efforts to adapt learning in the European Union member states to the possibilities and opportunities offered by innovative information and communication tools. The introduction of new technologies, notably IT-based technologies must also be accompanied and supported by training policies for teachers and trainers. On a EU level the follow-up of the Lisbon process should quickly be reflected in the support programmes of the Community. The imminent merger of four European Community education and training programmes into one, and the start of the VII Framework Programme for research provides such an opportunity and should be geared to promoting some pragmatic actions in sectors with a strong job creation capacity.

5.4 Language skills and cultural awareness in an international environment

Europeans are privileged with an increasingly international environment as a result of the continuing completion of the European Single Market and integration in general. This unique situation must be considered as an opportunity to create a competitive advantage. However, the lack of language proficiency and knowledge of other cultures is still one of the main obstacles to mobility and international cooperation and collaboration. One of the challenges faced by the automotive sector today is the *national* focus on education and training programmes, when they instead need to be international. The European automotive industry is an increasingly multi-lingual, multinational business environment, where improved linguistic proficiency is a prerequisite for working in companies with expanding international business. The growing intensity of global planning, networking and interaction with manufacturers' organisations as well as between the manufacturers, systems integrators and the companies constituting the automotive supply-chain, require competences such as communication skills, fluency in at least one foreign language as

well as an understanding of different business cultures and international management practices.

Preparing people for international business assignments and implementing cultural awareness can be a challenging task, but is necessary in order to remain cost effective and competitive. International companies also need to support globally diverse design and development teams, helping them work together most effectively for innovation and rapid time-to-market. Learning or seeking advice between plants in different countries can be a quick and cost effective way to solve a problem, but will require language skills and cultural awareness. These skills are also especially important for purchasers, as global sourcing increases and materials and components may be cheaper in another part of the world.

While the benefits of language learning should be extended to all citizens as a lifelong activity, in line with the Commission's 2003 Action Plan for the promotion of language learning and linguistic diversity (COM(2003) 449 final), it should be made a priority in schools everywhere across Europe today to make sure that all students receive education and training in at least two foreign languages from an early age. Language teachers have a crucial role to play in building a multilingual Europe, as they are called upon to exemplify openness to others, tolerance of differences, and willingness to communicate. The institutions responsible for training language teachers need to ensure that these teachers have a profound understanding of the role language plays in, for instance, European industry. As pointed out by the European Commission, these institutions should, through European cooperation programmes, develop closer working ties with counterparts across Europe and produce practical teacher training courses and materials that draw upon the best experience in Europe, aiming to improve the teaching of teachers.

5.5 Teacher and trainer education and training

Teachers and their trainers have a pivotal role to play in the definition and introduction of new teaching areas. They are in fact the main players in inspiring students and integrating most of the skills brought up in this paper into the content and practice of education and are thus instrumental. Therefore, the training of teachers and others involved in education and training of young people must be in the forefront of European action to promote pedagogical innovation.

It is clear that the changes needed in teacher education are not just matters of changing the rules, or of reorganising schools, training institutions or universities, or rewriting the curricula. These measures do not themselves result in much qualitative change unless a further step is taken to assist the teachers and trainers in developing their professional skills. Intensifying links with, and enhancing understanding between, education and training institutions also requires more short-term placements for teachers into industry and commerce. Teachers, at all levels, have to be given more authentic pictures about, for instance, science and technology, and the careers related to these subjects. Currently there appear to be few such programmes available. The European Community and the EU member states have to invest solidly in the training of teachers and trainers. Focus should be put on the development of initial and continuing teacher education and training by the identification and dissemination of best practices. Continuing professional development is imperative in the teaching profession, and every teacher should be entitled to it. Moreover, adult education and methods adapted to the learning style of an ageing workforce should be given higher priority in order to meet industry needs.

5.6 European Qualifications

Steps are being taken at both national and EU level to tackle the increasing complexity of modern education, training and learning systems, and CLEPA welcomes the consultation process and setting up of a voluntary European Qualifications Framework, proposed by the European Commission. This enables qualifications frameworks at national and sectoral level to be related to each other, thus facilitating the transfer and recognition of the qualifications of individual citizens and providing guidelines for cooperation between stakeholders at different levels. Within the proposed European Qualifications Framework it is especially important that the Commission ensures that the validation of non-formal and informal learning remains one of the main focal points of the framework as this would facilitate employment processes for, among others, SMEs as well as enhance labour mobility for individual citizens.

It is central that Member States' governments take a European perspective in qualifications issues and that they are more open towards EC-led initiatives, working towards common goals. Differing curricula, diploma requirements and research programmes cause barriers to free movement of workers. Therefore, in order for Europe to play a more competitive role in the world markets, Member States should invest in qualifications, which are fully recognised and accepted throughout the EU.

6. Continuous education, training and learning

6.1 Facing up to the challenge of an ageing workforce

Within the automotive industry, those enterprises and workers most in need of investment, such as SMEs, the unskilled and, especially, older workers, are those benefiting the least. Europe's ageing workforce is characterized by high rates of age-biased skills and knowledge deficits, along with high inactivity and unemployment rates. As the proportion of the older working-age group rises, maximizing their employment rates and productivity will be vital to ensure a sustainable functioning of the economy. Urgent action is needed to develop more encompassing lifelong learning strategies and workplace training for older workers, to ensure that a higher share of those currently aged 55-64 stay in work, and to keep a much larger share of those currently in their 40s and 50s in employment.

Since the late 1990s, the European Commission has identified the low employment rate among older workers as one of the main areas for action, introducing guidelines to slow down this trend such as encouraging the member state governments and social partners to develop a policy focussing on continuous training, flexibility of working hours and age oriented HR policies, recommending the strengthening of older workers' employability through revising hiring regulations and introducing appropriate practices in the workplace and adopting the Employment Directive on equal opportunities irrespective of gender, race and age criteria. ("Towards a Europe for all ages" (COM (1999) 221 Final), Guidelines for Employment Policies (EU9909187F), etc.). Many countries have adopted a mix of tax and educational measures to discourage the use of early retirement, promote the hiring of older workers and upgrade the skills of mature workers. In Germany, collective agreements include several regulations concerning age, especially the industry-wide agreements, and as far as training is concerned, the project "New Deal 50 Plus", launched by the British government in 1999 with the aim of upgrading the skills of workers above 50,

is particularly interesting. Such projects should be widely supported, advertised and campaigned in the EU25.

In the automotive industry, there is a need to up-skill, for instance, older manufacturing operators, to provide them with knowledge such as basic IT skills. Up-skilling and updating the knowledge of older workers is an urgent and challenging task, which must be undertaken if both old and new EU member states are to remain competitive. (It should be pointed out though, that outdated skills could occur at any age, because of the fast pace of change in the industry.) In the CEECs, the demographic challenge is coupled with major shifts in the sectoral employment structures. These shifts suggest that the demand for a more qualified labour supply will increase further and therefore the supply of skills needed to match the new demand will rely heavily on the up-grading and up-dating of the skills of the present workforce.²⁴

Motivation for learning is a key factor, which requires a learning climate and oriented corporate culture. The organisation of work, the information network, systems used for work acknowledgement and evaluation are all important factors in creating a motivating environment. Possible actions to promote motivation for learning among older workers include recognition of achieved results through “token” rewards; introduction of skill-based pay; transparency in career opportunities and equal treatment for older workers and young workers. Further, using a suitable methodology capitalising on the workers’ concrete expertise, the knowledge acquired over the years and the “problem solving” ability inherent in their activity can help and motivate older workers to continue training and learning. It is evident across the automotive industry that older professionals subscribe to both traditional and online learning and re-skilling to ensure their own employability. In view of the fact that travel, time away from the job and the home, and the leaner operation environment may restrict movement particularly for these professionals to have access to any necessary learning elsewhere, e-learning is particularly important for this age-group, and should be strongly encouraged by all stakeholders.

Above all, the negative stereotypes attached to older employees need to be changed. Companies should tackle this issue with an overall approach based on the development of a continuous learning culture, going beyond age differences and acknowledging everyone’s needs. This culture embraces behaviours, style of management, organisational models, industrial relations systems and HR policies. In the long run, lifelong learning should be not only a guiding principle, but also an attractive part of life.

6.2 Knowledge Management

Remaining competitive in the automotive industry does not only require new skills, it also requires the retention of the important, often tacit, knowledge that already exists within a company. There is increasing awareness that knowledge is a valuable organisational asset that should be managed in the same way as other organisational resources. Automotive companies need to ensure that vital skills and knowledge are retained in the firm when older people retire. One way of doing this is to develop innovative age management strategies and human resources policies that recognize value and utilize job competences (skills, knowledge, attitudes) of older workers using knowledge management methods. Knowledge must be identified, acquired, stored, developed and shared to increase the value and effectiveness of an organization. Organisations need to develop

²⁴ UEAPME, *Policy Fact sheet n°3, Vocational training and Lifelong learning* on www.ueapme.com

knowledge management systems and supporting management frameworks.

KNOWMOVE (www.knowmove.org) is a new project for and by automotive suppliers and manufacturers, developed together with CLEPA, trade unions and the European Commission through the European Social Fund (Article 6), to encourage automotive companies to recognize their older workers as a valuable resource. The aim is to make full use of the job competence (including tacit and business practice knowledge) of older workers in the workplace, encouraging and motivating older workers to stay longer in the labour market focusing their contribution on knowledge transfer and mentoring functions, and providing improved working conditions, as well as fostering innovation within companies by encouraging the free flow of ideas between older and younger workers. These approaches and models will be piloted by the trade unions and automotive companies involved in the project during 2005-2006, and the lessons learnt will be disseminated at European level through the direct involvement of social partners (automotive trade unions and industry associations).

6.3 Making lifelong learning a reality

The skills and competences, which have been described above, can only be of value and contribute to enhancing the competitiveness of the European automotive industry if they are continuously updated and built upon. In an anticipated turbulent, unpredictable and highly competitive environment, many people will find themselves switching jobs four or five times in their life. Therefore "learning" is acquiring a much more action-oriented meaning that will cover the whole period of the individual's initial education period and subsequent professional life. Thus, education and training can no longer be restricted to the first third of someone's lifetime. It has to become a life-long feature of individual, social and professional development. The spirit of learning has to shift away from training to be an employee, towards an entrepreneurial spirit and the ability and willingness of the individual to make a positive contribution. In the automotive industry, with its rapidly evolving technologies, the depreciation of intellectual capital is an urgent problem that can only be addressed with continuous updating and upgrading of skills.

Ensuring a culture of continuous learning becomes even more pressing as the EU is facing unprecedented demographic changes that will have a major impact across society and the economy. People are living longer and in better health. According to the European Commission's Green Paper "Confronting demographic change: a new solidarity between the generations" (COM (2005) 94), fertility rates have dropped to 1.5 children per woman, and in 2030 Europe will have 18 million children and young people fewer than today. By then, the number of "older workers"(aged 55 to 64) will have risen by 24 million and the EU will have 34.7 million citizens aged over 80 (compared to 18.8 million today). The declining birth rates and general ageing of the population implies that economies will no longer be able to rely solely on the skills of new labour force entrants -people will need to submit themselves increasingly to adult continuing education processes to match employing companies' expectations and skill needs.

Resulting from the constant technological developments in the automotive industry as well as the demographic changes taking place in the Europe, the concepts of "lifelong learning" and "learning organisation" must be seen as the paradigms of both the industry as well as education and training institutions Europe-wide.

The capacity to learn more rapidly than competitors is one of the only durable advantages of competition. This means that companies have to develop into "learning organisations". A prerequisite for achieving the ultimate and broader goal of making a company a "learning organisation", is that workplaces have to be changed into a continuous working-learning environment. To achieve this ambitious goal, a broad acceptance of the "continuous learning" concept by the workforce is required. This requires an individual capacity for continuous change and employees with a high level of basic qualification and motivations. Many of the vehicle manufacturers and larger suppliers have had learning management systems in place for a few years, and employees are beginning to realise that in such an organisation, it is impossible to continue a career if you are unwilling to continue learning throughout your working life. In this environment, it is imperative that individuals take more direct responsibility for their own continued training. Currently, some factors, such as negative attitudes towards learning, unwillingness to take personal responsibility or financial constraints, inhibit greater lifelong learning activity on the part of individuals.

Changing attitudes is probably the biggest challenge there is to the implementation of lifelong learning in the European Union. Many in the European automotive industry have acquired the experience over the last years of radical adaptation, that it is not so much organisational, technological change and cost reduction that has created some of the most important problems in the change process, but the difficulty to change peoples' mindset, perceptions, attitudes and mentalities, irrespective of the individual person's position in the organisation. These factors need to be addressed by looking at both the demand and supply side. In addition to encouragement, (paid) time off for training and the provision of financial support (targeted at triggering interest), on the one hand, and improved information and more accessible provision (targeted at eliminating barriers), on the other hand, have to be considered together.

Although many of these initiatives need to be taken by the individual companies, continuous training and education, and the motivation it requires, can not be achieved by the industry alone, but requires cooperation from national governments in removing or lowering taxation on educational courses for employees, as well as more awareness campaigns to highlight the further education and training incentives already provided by various governments across Europe. For instance, the Belgian regions have implemented a system of training cheques, where companies pay 50% of their training costs (up to €6000) and the regional government pays the other 50%, so that a company can receive a subsidy of €3000 to set up a training programme. In France, there is now in place a new education and training law where there is an obligation to invest 1.6% of a gross salary in education and training, redistributed among employees. Employees can train outside working hours should they like and all employees are entitled to ask for 20 hours of training per year for six years up to 120 hours.

Still, there is also a need for a more extensive use of EU-wide programmes and funding initiatives for education and training, such as the European Social Fund, and a heavier focus from the European institutions on pan-European awareness campaigns, bringing public attention to the good initiatives that exist in Europe. These initiatives should not merely be applauded, but should be encouraged and provide learning opportunities for all.

7. Action proposals for education, training and learning

Action Area	EU level	National level	Industry level
Proposals for lifelong learning and competitiveness	The follow-up of the Lisbon process should quickly be reflected in the support programmes of the Community. The imminent merger of four European Community education and training programmes into one, and the start of the VII Framework Programme for research provides such an opportunity and should be geared to promoting a set of pragmatic actions in sectors with a strong job creation capacity.	The concepts of lifelong learning and learning organisation must be seen as the paradigms of both the industry as well as education and training bodies Europe wide.	Industry must allow all employees the opportunity to update their competences and learn new skills, be it through internally or externally managed courses, participating in projects led by industry associations, or being part of a cluster.
	The European institutions should strongly work towards ensuring the approval of the budget for the new EU Integrated Action Programme for Lifelong Learning.	A higher rate of the various Member States' GDP should be spent on education, training and research.	The industry should define the methods that will motivate older workers to develop lifelong learning and stay in employment.
		Governments should prioritise education and training on the European agenda, and should start this commitment by approving the budget for the new EU Integrated Action Programme for Lifelong Learning.	Lifelong learning in industry should be promoted by rewarding people who are willing to change. Incentives to continue learning and training need to be addressed by looking at both the demand and supply side. In addition to encouragement, (paid) time off for training and the provision of financial support (targeted at triggering interest), on the one hand, and improved information and more accessible provision (targeted at eliminating barriers), on the other hand, have to be considered together.

Action Area	EU level	National level	Industry level
		National governments must encourage and ease lifelong learning in the industry by removing or lowering taxation on educational courses for employees, as well as initiating more awareness campaigns to highlight the incentives for further education and training already provided by various governments across Europe.	Invest more in education and training in 'old' Europe, and not just lower-cost countries.
		National, regional and local governments should introduce projects with the objective of upgrading the skills of workers above 50. Such projects should be widely supported, advertised and campaigned in the EU25.	
Action Proposals for Research and Development	In transport R&D, a "transport systems" perspective has to be taken that considers the interactions of vehicles, transport networks and the use of transport services. This can only be developed at European level. The Member States and the European Commission must ensure that the funding allocated to research into transport systems should be distributed so that a fair level reaches the road transport sector, as it accounts for the majority of transport in Europe.	The level of public funding per researcher in Europe needs to increase in order to create more and better research in the R&D community, similar to that in the US.	Industry needs to improve the R&D climate for researchers within industry to reach better results, comparable with those of some of its global competitors.
		Member States must adapt policies and taxation to ensure that SMEs increase their knowledge and research intensity, internationalise their knowledge networks and expand their business activities to larger markets.	

Action Area	EU level	National level	Industry level
Action proposals for collaboration between stakeholders to further competition	The European Social Fund should be used further to promote cooperative projects in education and training in the automotive industry. Both the European Commission and the national and regional governments who administer the funds must tackle the problems associated with applying for the financial support, ensuring that the funding reaches those companies most in need.	Governments should work towards establishing strong partnerships, such as automotive academies, with the automotive industry, particularly the industry associations in all countries in the EU25. Especially SMEs can benefit from such partnerships, where the challenge to reach a competitive level in science and technology, as well as in other skills, can easier be met through establishing cooperative frameworks for training, learning, research and development.	Automotive companies and industry associations should push for the establishment of partnerships with governments, working towards ensuring competitive levels in skills throughout the supply chain.
			SMEs should take the step and participate in regional, national and European projects and knowledge networks, as this gives much needed contacts, stimulates exchanges of best practices and innovation that single companies or researchers might not afford to acquire alone.
			CLEPA should establish a 'good practice' data bank for education and training, to build up networks and encourage international know-how exchanges.
Action proposals for reform areas in primary, secondary and tertiary education	The European institutions, together with Member States, should work towards promoting secondary and post-secondary education that reflects industry needs, such as automotive courses. These should include specific aspects such as safety technology, fuel efficiency, recycling, robotics, applied chemistry, design and the wider issues of economic impact, environment, logistics and total quality.	The individual Member States must ensure that every young person leaves the education system qualified and skilled, with a basic understanding of mathematical, scientific and technical disciplines as well as competences, ranging from social and communication skills to methodological and analytical skills.	The automotive industry should put effort into enhancing the experience of science, engineering and technology education throughout all stages of the educational systems in Europe through, for instance, inviting school visits, taking on students for work experience, initiating design competitions and providing lectures and presentations for classes.

Action Area	EU level	National level	Industry level
		National and regional authorities must, together with educational bodies, ensure that curricula for education at all levels reflect the competences required in Europe today, including 'soft' key competences such as problem solving skills as well as more traditional subjects such as science and technology as applied in the work place. The level of literacy required for scientific and technical skills should be defined at primary, secondary and tertiary education.	Enterprises, industry associations and clusters should propose further and better cooperation with universities and technology poles, to push R&D and innovation, and ease recruitment of graduates with relevant skills and knowledge.
		Science and technology must be promoted as a viable choice for students, and the acquisition of scientific and technical skills should be encouraged at a national level.	
		Further, better and more pragmatic cooperation between industry and tertiary education institutions needs to be established to ensure that curricula reflect applied knowledge and that there is a supply of graduates with the 'right' skills, to push research, development and innovation forward.	
Action proposals for vocational training	Vocational training should receive more attention within the European level education and training policies. A survey should be carried out to chart the supply and demand for vocational training programmes suited to the automotive sector. The European Commission should create incentives for both schools and students to strive for better quality of curricula and performance. Prizes, competitions and excursions at EU level could be promoted to this effect. Such measures would also raise the profile of a career in the automotive industry	Vocational training needs to be made more accessible, and should be improved by stronger practical orientation. Special vocational "automotive" courses and educations should be created <i>throughout</i> Europe. Such education should not be limited to the specific company colleges that exist, but should be widely available to those who wish to further their knowledge and gain a recognised qualification in automotive technology at secondary and post-secondary level education.	

Action Area	EU level	National level	Industry level
Action Proposals for apprenticeships	Apprenticeship programmes should be further promoted at European level, with more focus on apprentice exchange programmes, making it attractive to the European student.	Apprenticeships must be further promoted and supported at national level through, for instance, apprenticeship training tax credit and scholarships for young apprentices.	Apprenticeships should be increased throughout industry, both in SMEs as well as the bigger companies, and apprentices should be regarded as investments and future employees and not as discounted, temporary labour.
Action proposals for key competences		National, regional and local governments need to ensure that educational systems focus on developing learners' decision-making and problem-solving skills, teaching them how to learn on their own and with others. Problem solving skills should be taught from secondary education onwards, and collaboration between universities, industry and leading edge training and consulting bodies needs to be established and supported to assist this.	Industry should define best practice in problem solving and innovative thinking and encourage it throughout the automotive industry, at all levels, in all parts of the supply chain. Employees must learn to better manage tools and techniques for lean enterprise practice, as well as risk management and integrated loss prevention.
		Teamworking skills need to be made part of all stages of education and training and educational bodies should be encouraged to understand the difference between team and individual learning, promoting team-based learning more actively.	Companies should identify the new competences needed in the industry as well as retain and pass on the knowledge of older workers.
		National and regional governments should make it a priority in schools everywhere across Europe today that all students receive education and training in at least two foreign languages from an early age.	
		Member states should, together with industry associations and clusters, work towards finding ways of making it easier for SMEs to access training for subjects such as communication skills and project management skills, for example, through automotive academies.	

Action Area	EU level	National level	Industry level
<p>Action proposals for professional development for teachers and trainers</p>		<p>Intensifying links with, and enhancing understanding between, education and training institutions requires more short-term placements for teachers into industry and commerce. The EU member states have to invest solidly in the training of teachers and trainers. Focus should be put on the development of initial and continuing teacher education and training by the identification and dissemination of best practices. Teachers, at all levels, have to be given more authentic pictures about, for instance, science and technology, and the careers related to these subjects. Continuing professional development is imperative in the teaching profession, and every teacher and trainer should be entitled to it and persuaded to continuously update their knowledge and teaching methods throughout their career. Moreover, adult education and methods adapted to the learning style of an ageing workforce should be given higher priority in order to meet industry needs.</p>	<p>The European automotive industry needs to intensify links with teacher and trainer education and training, and provide teachers, at all levels, with accurate and authentic pictures about science and technology and the careers related to these subjects. Industry should open doors for this type of placement.</p>
		<p>The introduction of new technologies, notably IT-based technologies must be accompanied and supported by training policies for teachers and trainers.</p>	

Action Area	EU level	National level	Industry level
		<p>The institutions responsible for training language teachers need to ensure that these teachers have a profound understanding of the role language plays in European industry. These institutions should, through European cooperation programmes, develop closer working ties with counterparts across Europe and produce practical teacher training courses and materials that draw upon the best experience in Europe, aiming to improve the teaching of teachers.</p>	
<p>Action proposals to ensure European Qualifications</p>	<p>The Commission needs to ensure that the validation of non-formal and informal learning remains one of the main focal points of the European qualifications framework. An action plan should be drawn up in collaboration with the automotive industry and the education authorities concerned to remedy any mismatches of supply and demand.</p>	<p>Governments need to take a European perspective and to be more open towards EC-led initiatives, working towards common goals. Differing curricula, diploma requirements and research programmes cause barriers to free movement of workers. In order for Europe to play a more competitive role in the world markets, Member States should invest in qualifications, which are fully recognised and accepted throughout the EU.</p>	
		<p>National governments should encourage the setting up of a system where competencies and vocational experience acquired by employees on the job can be certified. While it is clear that competence goes beyond qualifications, a system which recognises these qualifications would facilitate employment processes for, among others, SMEs as well as enhance labour mobility for individual citizens.</p>	

8. Conclusion

Through this White Paper on Education, Training and Learning, CLEPA has sought to provide impetus for dialogue and joint work on education and training between all stakeholders. Overall, it is clear that governments, the European Commission and the European Parliament, public authorities, private companies and their professional representations, public and private education and training institutions and the unions must focus harder on education and training needs in Europe to ensure the competitiveness of the European automotive industry, and hence, employment and income for millions of Europeans.

The European automotive sector must be at the cutting edge of innovation, research, development and quality to remain competitive, and this can only be achieved by a highly-skilled and trained workforce willing to learn throughout their careers.

CLEPA believes that the European institutions, particularly the European Commission, have an important role to play in supporting the improvement of European education and training, strengthening research and development in the EU25, and providing a shared European outlook to counter problems facing the whole continent. Nevertheless, many of the problems associated with education and training need to be tackled on a national and regional level, and so it is the individual member states' and regions' responsibility, together with industry, to develop and implement education and training that meet the requirements of a knowledge-based industry and society.

The stark reality is that if public and private sectors on both European and national levels do not support investment in education, training and research, the competitiveness of the European automotive industry will ultimately dwindle. Therefore, it is up to the key stakeholders in this industry to forge resolutely ahead by setting up future dialogues and forums, with a view to implementing the correct measures to ensure the competitiveness of the automotive industry for the workforce of today and for future generations.

The current situation is precarious and we must act now!

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