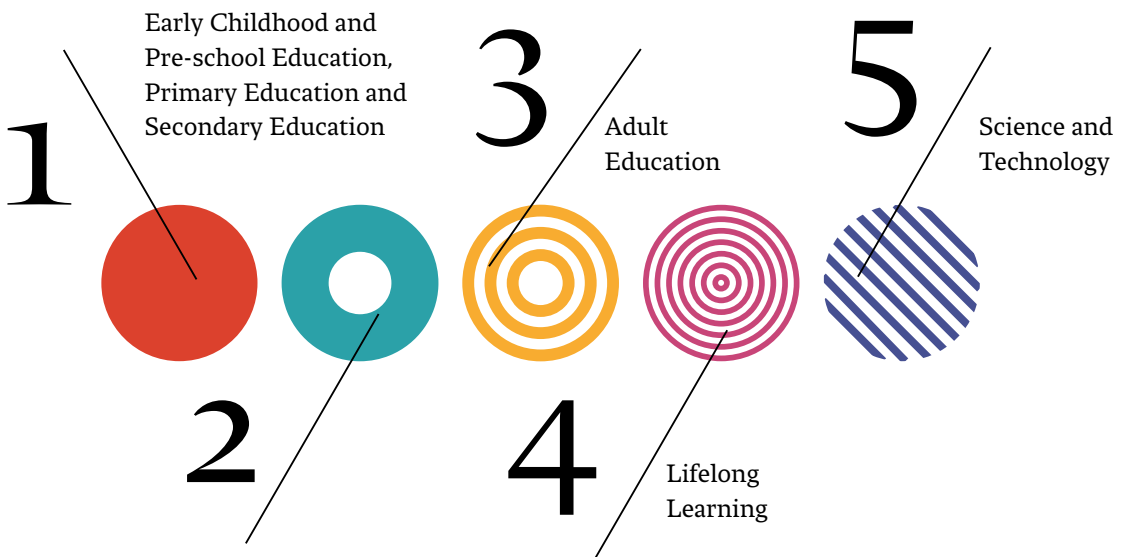


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Strategy for Education, Science and Technology



STRATEGY FOR EDUCATION, SCIENCE AND TECHNOLOGY

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Strategy for Education,
Science and Technology



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INTRODUCTION

Croatia recognises education and science as its developmental priorities: they can provide Croatia with long-term social stability and economic development, as well as safeguard its cultural identity. The reasons for this are that Croatia is currently:

- facing dynamic changes in its society, economy and culture in a globalised context where no country exists as a separated community;
- facing challenges such as the application of new technologies, environmental protection and population ageing, which can only be resolved through science;
- faced with limited human, material and natural resources, meaning that each of these resources must be used in the best possible way;
- faced with limited possibilities of predicting long-term development and has to be prepared to adjust.

In order to reach the level of highly developed countries, Croatia has to be an open, mobile and innovative society.

Education and science are of special public interest. In Croatia, education is available to everyone on equal terms, in accordance with their abilities. The state accepts the responsibility for the development and management of the education system, in collaboration with the private sector.

The need to develop a Croatian strategy for education, science and technology arose due to the profound changes that Croatian society is currently facing. These changes (as highlighted above) are the consequence both of the changed globalised context and of internal social, economic, cultural and demographic changes. Such circumstances require long-term thinking about the place of education and science in society, especially when aiming to develop an innovative society and economy that can adapt to future challenges that are difficult (or impossible) to foresee today. In modern societies, the capital of creative human knowledge is a distinct advantage for the development of a country, arguably more so than the capital of natural resources and routine work, or even than financial capital. Such societies have therefore significantly increased their investment in knowledge, which has taken a leading place in projections for strategic development. The basis of education is the concept of lifelong learning, which encourages individuals of any age group to learn and provides them





with continuous access to education and the possibility of recognition of various forms of learning.[1] Lifelong learning, science and innovation form the knowledge triangle, whose effective functioning is enabled by the support of the state. Education at all levels will be able to fulfil its role in the knowledge triangle in a more permanent way if research and innovation results have an impact on educational processes. Educational environments also have to be improved by encouraging creative thinking and innovative action.

Education will be founded on the following principles: general primary education will be compulsory; horizontal and vertical mobility through the system will be ensured; all persons— especially those exposed to marginalisation and exclusion — will be included in the education system, which will be based on scientific knowledge; human rights and children’s rights will be respected; all the staff in the system will be competent and will respect professional ethics; decisions will be made democratically with the participation of all key stakeholders; schools and teachers will be autonomous in planning their work; and both inter- culturalism and the European dimension of education will be respected.

Croatia must, on the one hand, become involved in the strategic planning of the European Union expressed through a series of documents such as Horizon 2020, Innovation Union, A Digital Agenda for Europe, Youth on the Move, A Resource-Efficient Europe, Industrial Policy for Green Growth, Agenda for New Skills and Jobs and European Platform against Poverty and Exclusion. On the other hand, Croatia must also take into account its specific needs, which can only be met in the long term. For this reason, the Strategy is designed to propose measures in line with the strategies of the European Union, as well as objectives expected to be met by 2025. This Strategy is also based on a series of Croatian documents and publications aimed at organising or improving the education and science system, such as: Croatia on the Threshold of the Third Millennium (2000); Declaration of Knowledge (2002); Croatia Based on Knowledge and the Application of Knowledge (2004); Education for a Technology-Dependent Knowledge Society (2007); Croatian Schooling — Current State and a Vision of Development (2008); and Knowledge — The Basis of Competition and Development (2011). Based on the positive experiences of some countries, developing a strategy such as this one is only possible if a vision of long-term development is followed. The approach adopted in this Strategy (which is based on the Guidelines for the Strategy of Education, Science and Technology developed by the Croatian Academy of Science and Arts — MZOS/MSES, 2012) strives for a comprehensive, flexible and efficient education system that merges all levels and forms of education and research into a harmonious and transparent whole based on common positive values, principles and goals.

The demographic situation in Croatia from 1990 until today is characterised by depopulation and population ageing. Population projections until

2050 indicate a demographic trend in terms of the ageing of the general population and of the working-age population, as well as a considerable decrease in the number of school-age children. Such changes in natural dynamics, migration balance and the age structure of the population have a strong impact on workforce reproduction, thus restricting the overall work potential and labour productivity, as well as the overall economic development of Croatia. Moreover, these changes have major societal impacts and imply the need to re-examine the network of all education institutions including kindergartens, primary schools and adult education institutions.

Since globalisation has resulted in changes that are rapid and unpredictable (in part thanks to new technologies), this Strategy needs not only to facilitate the flexibility and adaptability of the education and science systems, but also to make the Strategy itself subject to continual review and to periodic revisions. Therefore, the precondition for the continuous, consistent and long-term implementation of the Strategy is that it be adopted by all relevant stakeholders, including by Croatian society as a whole and by all major political parties.

Croatia's human and material resources are limited and this situation will not change in the near future. It is therefore essential to plan gradual changes that take into account the existing strengths of the education and science systems. It is also essential to ensure that the implementation of this Strategy does not have a negative impact on the quality of the system and that the funds and efforts invested reach the best possible results. The Strategy is therefore based on the following principles: evidence-based policy making; the efficiency and enhanced funding of the system; the introduction of changes in a gradual and logical manner; and the systematic monitoring and evaluation of the results of implemented measures.

This Strategy is based on the fundamental principle of ensuring the autonomy of all education and scientific institutions, as well as the autonomy of their staff. It is therefore essential to create the preconditions to achieve this goal. Firstly, the outcomes of each education segment and of research need to be clearly defined — in this respect, the Croatian Qualifications Framework is an important tool. Another precondition is the existence of a quality assurance system that validates the success of educational processes and research. This system is currently only partially developed (AZVO/ASHE) or is not fully implemented (NCVVO/NCEE), whereas some parts of the education system are not covered by any type of quality assurance at all (in early childhood and pre-school education, primary education and adult education). An important precondition for the autonomy of educational staff is raising their level of competences by enhancing the system of teachers' initial education and continuing professional development.

Autonomy of early childhood and pre-school institutions, primary and secondary schools, adult education institutions, higher education institu-





tions and research institutes, combined with adequate financial rewarding of staff, fosters a sense of initiative and creativity among the staff. It also ensures the dignity of professionals in early childhood and pre-school education, teachers, other educational staff and researchers, as well as facilitating the easier adaptation of educational and research processes, thus improving their quality. Up to now, higher education and scientific institutions have had autonomy, whereas the autonomy of primary and secondary education institutions has been almost completely restricted. Ensuring the autonomy of schools and kindergartens will allow teachers and professionals in early childhood and pre-school education to become creators of student-centred learning activities.

Autonomy implies assuming responsibility for the outcomes of the educational process, which are validated by a system of self-evaluation and external evaluation. Success must be rewarded by providing additional incentives to education institutions and their staff, whereas a lack of success must result in providing assistance or imposing sanctions.

Universities play a special role in the implementation of the measures for the achievement of this Strategy's goals: they are places where new knowledge is created and transferred to students and other beneficiaries; they play an active role in the creation and implementation of the educational and research process; finally, universities are places where those who will be implementing the educational and research process are educated. Research universities, where education is based on research, are the foundation of knowledge-based (and innovation-based) societies and economies. Such universities are characterised by diversity instead of uniformity and similarity, as well as by inter-disciplinarity, multi-disciplinarity and trans-disciplinarity in education and research. The educational paradigm of 'learning through research' is present at such universities. Universities must assume an active role in transferring innovations from science to the economy and to society. Universities also play an important role in the lifelong learning system by developing education curricula, training programmes (especially by experts working in the education system) and contemporary teaching aids. Universities must play an active role in their immediate environment (social, economic and cultural) with which they need to interact constantly. Special attention must be paid to strengthening the links between universities and the economy.

A successful economy cannot only be built by establishing marketing and market mechanisms if there is a lack of new and innovative products that can be placed on the market. Every economy consists of technologies, and real economic growth can only be achieved by innovating existing technologies or by introducing new technologies, processes and services. A successful innovative environment must therefore take into account all three components of the innovation process: innovation, development and marketing.

The process of implementing a strategy for the development of the education and research area, which includes the adoption of adequate legislation and concrete measures and decisions, must be accompanied by the support of all ministries, their agencies and other state institutions, as well as the coordination of all strategies for education and science. The implementation of this Strategy will be coordinated and monitored by a special expert committee at the Prime Minister's Office of the Republic of Croatia.

MISSION AND VISION OF THE CROATIAN EDUCATION AND SCIENCE SYSTEMS

The mission of the Croatian education system is to ensure high-quality education that is available to all on equal terms, in accordance with every individual's abilities. The mission of the Croatian science system is to enhance global knowledge through research and to contribute to the welfare of Croatian society, especially the economy.

This Strategy is based on the vision of Croatia as a society in which high-quality education has a major impact on every individual's life, on relationships in society and on economic development. Croatian society will be democratic, tolerant and innovative, and every person's individuality will be able to fully develop. The economy will be largely based on advanced technologies (thereby enabling the creation of a high added-value), and well-educated individuals will be able to find suitable jobs.







LIFELONG LEARNING

Lifelong learning refers to all activities aimed at the development of knowledge, skills, attitudes and values during one's lifetime (either through their acquisition or improvement), in the context of personal, social or professional development. Such a comprehensive concept covers learning at all stages of life and in all forms. It includes programmes of formal education (early childhood and pre-school education; primary education; secondary education; higher education; and adult education and training), non-formal education, as well as incidental and spontaneous acquisition of knowledge, skills, attitudes and values through non-formal and informal learning. Lifelong learning represents the basis for personal development and for developing the capability of individuals to continuously adapt to changing circumstances in their personal lives, in the workplace and in the community.

The most important principles of lifelong learning for individuals are:

- the possibility of acquiring, improving and/or expanding knowledge, skills, attitudes and values;
- the possibility and the need for the development of personal potential in different stages of life;
- the possibility of access to different forms and contents of learning with the aim of achieving personal goals and developing abilities;
- the right to recognition of knowledge and skills acquired in different environments and through different forms of learning.

The outcomes of lifelong learning should primarily lead to the realisation and development of personal potential and should become an important element of active citizenship, while also enabling better employability of the individual, i.e. by increasing their competitiveness on the labour market. The dynamism, flexibility and competitiveness of more developed knowledge-based societies (which are also 'learning societies') are associated with the extent to which citizens are involved in various forms of lifelong learning and to the quality of the education process. In addition to the need of individuals to constantly learn, it is also important for organisations to keep educating themselves or support a learning environment — not only in the private sector, but also in the public, state and local administration.

For these reasons, the promotion and development of the concept of lifelong learning implies the need to integrate, permeate and align the often



conflicting objectives and activities of public policies (related to: social, economic and regional development; cultural development; employment; and social welfare) with the aspirations and potential of individuals. In addition to the public and state administration and education institutions, stakeholders such as trade unions and civil society organisations will also be included to a greater extent in the development and implementation of an integrated and harmonised approach to the processes of lifelong learning. Integrating lifelong learning and education policy with other policies and objectives of personal development and social aspirations is defined as a separate unit in the guidelines for the implementation of this Strategy. Several implementation measures are planned for the achievement of this objective. Among these, an analytical basis for tracking, monitoring and examining human resources will be developed that will link data from the education system, labour market and social welfare system. This primarily involves developing new databases and linking various registers of different government bodies. Databases will also be used in models for labour market forecasting and for defining future needs for specific occupations and qualifications. Special attention will be paid to the acquisition of knowledge and skills through work (work-based learning), especially at the level of vocational and higher education, as well as in adult education and training. Experience from industrially developed countries shows that a greater exposure to the world of work during education increases the employability of learners and allows them to adapt faster to the workplace.

The acquisition of key competences lays the basis of the lifelong learning concept. Key competences represent a transferable, multifunctional set of knowledge, skills and attitudes necessary for an individual's personal fulfilment and development, social inclusion and employment. The key competences for lifelong learning and functioning in society, as recommended by the EU Council and the European Parliament from 2006,² should be acquired primarily at a younger age, during the initial formative period and through different forms (and paths) of education and learning. The key competences are: communication in the mother tongue; communication in foreign languages; mathematical competence and basic competences in natural sciences; engineering and technology; digital competence; learning to learn (capability of learning processes, of organisation of one's own and other people's time, of collecting, analysing and evaluating/assessing information, etc.); social and civic competences; sense of initiative and entrepreneurship; fostering cultural awareness and national identity, creative and artistic expression.

The process of acquiring and further developing a particular group of key competences should foster: critical thinking; aesthetic evaluation/assessment; responsibility to oneself, others and the environment; teamwork; problem-solving skills; core ethical values; parenting skills, civic activism; media, financial and consumer literacy, etc.

well as cultural and other social challenges, a European Commission document related to the strategic rethinking of education³ points to the importance of equally acquiring transversal and key knowledge, as well as skills in science, technology, engineering and mathematics (STEM) from an early age. Such knowledge and skills are necessary for managing in a society dependent on technology and for implementing future activities in scientific research and technological development. They also serve as a solid foundation for lifelong learning. The European Commission document also states that vocational knowledge and skills should be of the highest quality, comparable at the global level and focused on work-based learning.

The performance of Croatian fifteen-year-olds in international assessments of knowledge (PISA)⁴ is average (or below average) in the area of linguistic and mathematical literacy and in the natural sciences. This indicates that the approach taken in primary schools related to the acquisition of knowledge, to teaching key competences and particularly to teaching application-oriented skills must be changed.

In Croatia, there are also many generations of individuals who, despite completing formal education, do not possess the specific knowledge and skills necessary for functioning in today's society. There is also a large population of elderly people who have not completed primary education. It can be assumed that almost none of them have acquired the key competences or possess the elements of what is referred to as 'functional literacy' (or 'new literacy'), which includes basic computational knowledge and skills, good knowledge of one's mother tongue, basic knowledge of a foreign language and the willingness and motivation to learn. Adult education programmes aimed at acquiring such knowledge and skills will be organised and provided to all of the above-mentioned groups of citizens.

In order to ensure the acquisition and development of the aforementioned competences, a set of curricula, processes, programmes and educational outcomes will be developed at all levels of education. The acquisition of these competences will also be strengthened by non-formal and informal types of lifelong learning.

Factors such as rapid changes in the labour market, population ageing and increasing global competition indicate the need to make use of all available knowledge and skills, regardless of where and how a person has acquired them. The validation of outcomes of non-formal and informal learning opens up new opportunities to individuals who have acquired certain knowledge and skills over their lifetime to obtain a formal recognition of such achievements and thereby become more employable and/or create the preconditions for their further education.

The system and processes for validating non-formal and informal learning have not yet been developed in Croatia. European trends, best practice





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and strategic/policy recommendations for the development and implementation of a system of validation of non-formal and informal learning⁵ represent starting points for the implementation of such a system in Croatia.

Young people are an important part of the population that should, in addition to attending formal education (early childhood and pre-school education; primary education; secondary education; and higher education), become much more involved in other various forms of lifelong learning. It will be crucial that the outcomes of such forms of learning be validated by a system of recognition of non-formal and informal learning, which is planned in this Strategy.

For the identification, development and management of human resources, it is essential to both strengthen existing and establish new and more efficient support processes and systems. In particular, it is necessary to ensure the recognition of individuals' abilities from an early age, the promotion and development of individuals' potential, and the provision of lifelong personal and professional guidance and counselling. Such processes will be purposely built into the education system from early childhood and pre-school education to higher education, as well as in adult education and through the public employment service. In the process of identifying and developing skills, particular attention will be paid to gifted individuals. For this reason, a number of measures proposed in the primary and secondary education reform are focused on gifted students.

High-quality and motivated educational staff (professionals in early childhood and pre-school education, teachers, adult educators, school principals and other educational staff) represent the foundation of the whole system of lifelong learning. Structural preconditions will be established to raise their awareness of the need for continuing professional development in pedagogy, didactics/methodology, psychology and adult education and to provide them with high-quality vocational training. Higher education institutions and adult education institutions^{6*} will develop new and high-quality programmes for their initial or further education and for their continuing professional development.

The dynamic development and application of information and communication technologies (ICT) is radically changing the paradigm of education and learning. The impact that ICT will have on the ways in which knowledge, skills, values and attitudes will be acquired, transferred and applied in the future is still difficult to predict. This Strategy defines measures for the development and diffusion of e-learning and for the introduction of expert teaching systems and other modern teaching methods based on information and communication technologies. These measures will be aimed at all levels and types of education. Open educational contents and tools with free access will also be developed and supported.

In accordance with the third mission of higher education institutions, universities in particular must take on new responsibilities related to the creation, organisation and implementation of various lifelong learning programmes.

All relevant EU resolutions and guidelines⁷ stress the need to implement the principle of lifelong learning in all forms of programmes for the acquisition of knowledge and skills. They also highlight the importance of including the highest possible number of citizens in lifelong learning, regardless of their age, social status and prior education.

The concept of lifelong learning is promoted in a number of policy documents from Croatia, including the White Paper on Croatian Education,⁸ the Education Sector Development Plan 2005–2010,⁹ the Development Strategy of the Vocational Education System in the Republic of Croatia 2008–2014, the Strategy for Adult Education,¹⁰ the Adult Education Act and other regulations related to adult education. The need for lifelong learning and education is also addressed by the Croatian Academy of Sciences and Arts in the Declaration on Knowledge (2002), Declaration on Knowledge — Croatia Based on Knowledge and Application of Knowledge (2004),¹¹ as well as in the conclusions of the Academy's 2011 round table 'Knowledge — The basis of competitiveness and development' and in its statement 'The importance of knowledge and application of knowledge for overcoming the crisis and further development of Croatia'¹²). In the two latter documents, the Academy underlined the need for deliberate human resources planning, for a new and expanded mission/role of universities in lifelong learning and for the necessity of transforming the education and research system as a basis for the social and economic development of the country. Finally, in the Guidelines for the Strategy for Education, Science and Technology (MSES, Committee for the development of guidelines for the Strategy for Education, Science and Technology, 2012)¹³ the concept of lifelong learning is dealt with in a separate chapter.

Despite such mainly declarative efforts, the development and application of the concept of lifelong learning is still in its early stages in Croatia. This Strategy therefore defines the objectives, activities and measures for its complete, coherent and harmonised realisation. Since there is insufficient awareness in Croatia of the importance and need for involving as many citizens as possible in various forms of education, training and learning, part of the proposed measures will include also a motivational dimension.

In the following section of the Strategy, five objectives relating to the overall education system (including both formal and non-formal education) have been identified and defined:

- develop a system for identifying, promoting and developing the capabilities and potential of individuals, and strengthen services for lifelong personal and professional guidance;
- improve quality and establish a quality assurance system;





- develop the processes and system for the recognition of non-formal and informal
- learning;
- improve the system of continuing professional development of educational staff;
- promote the application of information and communication technologies in education and learning.

The above-mentioned objectives do not include accompanying measures, since those are defined in separate units of this Strategy related to each specific level of education.

OBJECTIVE 1: DEVELOP A SYSTEM FOR IDENTIFYING, PROMOTING AND DEVELOPING THE CAPABILITIES AND POTENTIAL OF INDIVIDUALS, AND STRENGTHEN SERVICES FOR LIFELONG PERSONAL AND PROFESSIONAL GUIDANCE

Based on best-practices from developed societies, where human resources are the basis of economic success and social progress, it is essential for Croatia to gradually build a system that will deliberately identify, nurture, guide and foster the development of individuals' potential and capabilities.

Recognising talent and providing appropriate support for personal growth and development of each individual is the central mission of the education system. From early childhood and pre-school education up to higher education, it is necessary to continually recognise and encourage the development of competences and personal potential of children, youth and adults. At the same time, personal preferences should be harmonised with positive values and with social development objectives.

The key stakeholders in the development of such a coherent system for identifying, supporting, counselling, developing and guiding individuals' special abilities and talents will be educational staff, education institutions, employment agencies, clubs and associations, as well as foundations and financial institutions.

At the moment, artistic and sports talents are successfully recognised, while effective models of identification of other personal talents or potentials are not sufficiently developed. To track young people's preferences, special abilities and other relevant characteristics for their personal and professional development, it is necessary to systematically define the ways in which such support can be provided, based on best practices from European countries. For this reason, in the parts of this Strategy related to early childhood and pre-school education, primary education

and secondary education, measures are defined to address the recognition, fostering and guidance of gifted individuals.

In Croatia, such processes have begun to develop in recent years and are now improving and spreading. A consistent and harmonised system for human resources and career management (i.e. a system for personal and professional counselling and guidance) is therefore in the process of development. However, despite significant breakthroughs by public employment services and higher education institutions, there is still room for expansion and strengthening of these activities. Although such services exist in some primary and secondary schools (as well as in adult education institutions), they are still underdeveloped and cover an unsatisfactory number of users. Existing informational, counselling and guidance services are not sufficiently accessible and are not simplified or adapted to groups such as citizens with low educational attainment, the disabled, disadvantaged groups and elderly citizens. It is necessary to establish more career counselling and guidance centres and services, so that they are appropriately distributed across regions, structured as a network and easily accessible to all citizens, and to youth in particular.

In addition to professional guidance, a transparent system will be developed to provide easy access to basic information about formal education programmes (their contents, access conditions, outcomes and benefits). (See measure 1.3.2. in the Adult Education section).

New models of e-counselling can help in ensuring faster access to initial information and guidance. For such actions, it is necessary to develop a suitable basis (a dynamic database) and modern software solutions for the identification of users' preferences, abilities and competences. E-guides and mobile applications with advice on managing personal education and career paths should also be developed.

For all the planned activities described above, there is an insufficient number of trained counsellors and mentors that can tackle this type of complex tasks. There is also an insufficient number of formal education programmes to train such counsellors/mentors, either in the context of lifelong learning or within the higher education system. The prerequisite for the development of such programmes is to define competence standards for counsellors and mentors. For this reason, measures aimed at defining such competences are included in the Strategy sections related to primary and secondary education. By ensuring newly educated experts in counselling and mentoring, a basis will be provided for an increase in the number of counselling services, for enhancing their quality and for networking.

In this context, it is relevant to note that Croatian representatives have already been included in working groups of the European Lifelong Guidance Policy Network (ELGPN¹⁴). ELGPN is an important stakeholder that supports the development of national policies for lifelong guidance in Europe.





In order to encourage and promote an entrepreneurial environment and the effective transfer of entrepreneurial knowledge and skills, a network of counsellors, mentors and trainers from a group of experienced entrepreneurs should also be established.

OBJECTIVE 2: IMPROVE THE QUALITY OF EDUCATION AND ESTABLISH A QUALITY ASSURANCE SYSTEM

Quality assurance in education includes both internal quality assurance of institutions (based on self-evaluation) and external quality assurance (based on prescribed standards and criteria and carried out by an authorised agency that is itself subject to external evaluation). Quality assurance is the result of a process of evaluation covering institutions (e.g. processes and procedures, material and personnel conditions), educational programmes (e.g. relevance, methods of acquisition and assessment of learning outcomes) and student performance (e.g. exams, success in further education, employability).

The current system of external quality assurance and quality enhancement at the level of primary and secondary schools includes only a very limited level of evaluation of institutions (educational staff) and programmes. Such evaluations are carried out by AZOO/ETTA and MSES (for general education), by ASOO/AVETAE and MSES (for vocational education and training and adult education) and by NCVVO/NCEE (for external assessment). Quality assurance in higher education is carried out by higher education institutions themselves and by AZVO/ASHE, in line with the Standards and Guidelines for Quality Assurance in the European Higher Education Area.

Although in 2008 one of the strategic objectives for the development of vocational education was the establishment of a quality assurance system in vocational education and training, by 2012 this goal had not yet been fully achieved. Meanwhile, while the Adult Education Strategy (2004) recognised the importance of quality education, it did not aim for the development of a coherent system of quality assurance in adult education. In higher education, however, a quality assurance system is already regulated and institutionalised. Nevertheless, there is room for considerable improvement of the higher education quality assurance system. Namely, it is focused on the evaluation of procedures and the fulfilment of set standards and criteria, but lacks verification of efficiency as a key quality indicator.

The absence or inadequacy of a system of quality assurance of education is one of the factors that lead to multiple mismatches between available educational programmes and labour market demand, as well as to obstacles to enrolling in further education. Due to the lack of coordination

between higher education enrolment quotas and regional and local development policies, a large number of graduates are unemployed, despite the fact that there are vacancies for other occupations for which there is an insufficient number of qualified candidates. Employers also indicate that the competences acquired in the formal education system are not adequate for certain occupations.

Quality and quality assurance must primarily be the responsibility of educational providers and must be an integral part of their operational processes. However, in order for qualifications acquired in Croatia to be internationally recognised, the methods of ensuring and certifying quality need to be in line with internationally agreed principles. The quality assurance system must therefore be structurally defined, based on clear and objective standards, criteria and guidelines for quality enhancement, as well as on clear methods of evaluation. Additionally, the quality assurance system must have a clear division of authority and responsibility and must ensure the involvement of relevant stakeholders. While the internal quality assurance will be focused on quality enhancement, external quality assurance will provide objective recommendations for improvement.

In addition, the quality assurance system will also monitor efficiency indicators with regard to educational objectives. If the objectives of the educational processes are related to the acquisition of qualifications, the continuation of education or entering the labour market, the quality assessment will take into account the student performance with regards to their enrolment in further education or their employability.

The HKO/CROQF is developing the necessary elements and instruments for quality assurance of education. It represents a long-term basis for the establishment of an appropriate system at all levels, as well as for all forms of education and learning. The Ordinance on the HKO/CROQF Register defines the procedures for proposing and evaluating occupational standards, qualifications standards and learning outcomes by sectoral councils. Each approved qualification standard should be aligned with the relevant occupational standard (through learning outcomes). In this way, both employers and education institutions will be able to see more clearly which competences lie behind a given qualification (when considering candidates for further education or employment). Of course, educational programmes for acquiring a given qualification (accredited by competent agencies) can differ — and this is necessary when providing a diversity of educational programmes. However, all accredited educational programmes should be aligned with respective qualifications standards.

This Strategy proposes that the accreditation of educational programmes should be carried out by the agency responsible for a given level or type of education. The agencies in question are the following: AZOO/ETTA (for general education programmes), ASOO/AVETAE (for vocational education and training and adult education programmes) and AZVO/ASHE





(for higher education). Each of these three agencies is itself subject to external evaluation.

Based on the new data that will be available (and the related analyses that will be conducted) regarding the performance of students with different profiles in higher education, corrective measures will be implemented. Furthermore, a system for monitoring the employability of participants through a Registry of Human Resources will be developed, which will provide a necessary statistical basis for the monitoring of employees and the unemployed, and for further qualitative studies and analyses that will be carried out by the agencies responsible for vocational, higher and adult education. The results of such analyses will be taken into account in defining recommendations for the development of qualifications standards and for adapting educational programmes, as well as for reaching decisions about their funding.

In the Strategy sections related to primary, secondary and adult education, a number of objectives (and related measures) are proposed to improve the quality of educational staff and to develop a coherent system of quality assurance at those levels of education. For this reason, those objectives and related measures are not stated in this section.

OBJECTIVE 3: DEVELOP A SYSTEM AND PROCESSES FOR THE RECOGNITION OF NON-FORMAL AND INFORMAL LEARNING

The Croatian Qualifications Framework Act (2013) set the legal basis for the regulation of an integral system of recognition and validation of non-formal and informal learning.

For the development of such processes it is necessary to ensure a consensus of all relevant stakeholders. It is also necessary to create a legal basis for ensuring that all citizens can exercise their right to assessment and recognition of previously acquired competences. At the same time, it is essential to change the cultural view of non-formal and informal learning, promote learning and also promote a wide acceptance of non-traditional learning paths.

The system of validation of non-formal and informal learning is intended primarily for adults who already have work experience and 'life experience'. The validation of outcomes acquired through different forms of education and learning shortens the time that adult learners need to spend in education programmes. In this way, significant savings are achieved, both for the individual and for the community. Additionally, barriers are removed between the formal education system and competences acquired through other forms of education and learning.

The recommendations of the Council of the EU define the main stages in the process of validating non-formal and informal learning as the following:

- identification of learning outcomes that an individual has previously acquired;
- documentation of the acquired learning outcomes;
- assessment of the acquired learning outcomes;
- certification of the assessed learning outcomes in the form of qualifications, partial qualifications or in some other form.

In the validation and recognition of non-formal and informal learning it is also necessary to provide expert support and guidance to individuals. All participants included in the process of validation and recognition of prior learning need to have the possibility of acquiring additional competences. The validation should be carried out by the institutions that have the best expertise in a particular subject or in particular area of knowledge and skills.

The first attempt to enable adults to validate competences acquired outside the formal education system was regulated by the 2007 Adult Education Act. The Act stipulated that adults could demonstrate their knowledge, skills and abilities through examinations, regardless of the manner in which they had acquired them. Subsequently, the Vocational Education Act ('Official Gazette', no. 30/09) stipulated that the competences acquired through non-formal and informal learning could be demonstrated by examinations, in accordance with occupational standards and vocational qualifications. The Act stipulated that the procedure and manner of conducting the examinations to assess competences acquired through non-formal and informal ways would be prescribed by the Minister.

In addition to promoting the principles of quality assurance of education, the implementation of HKO/CROQF at all educational levels will also enable transparency, comparison and transfer of qualifications between different education institutions. This can occur both at the national level and at the European level (through its referencing with the EQF), with learning outcomes as the common reference point. In accordance with the Recommendation of the European Parliament and the Council of 2008 on the Establishment of the European Qualifications Framework for Lifelong Learning, qualifications acquired in EU Member States should include a clear reference both to the level of the national qualifications framework and the level of the European Qualifications Framework.

One of the support mechanisms for the recognition and transfer of acquired qualifications, (both within the country and internationally) is the indication of volume, i.e. of the workload needed for achieving certain learning outcomes. This should be the result of developing a Credit System for Vocational Education and Training (ECVET) and linking it with the credit system in higher education (ECTS). Credit points for vocational





education support the development of a system oriented towards learning outcomes, the development of a system for validation and recognition of prior learning and the development of qualifications and assessment methods based on learning outcomes. The vocational education and training system and the development of vocational qualifications will therefore be based on the principles of HKO/CROQF.

Instruments developed by the European Commission, such as Europass and Youthpass, will further facilitate the visibility and recognition of competences acquired through non-formal and informal means (especially competences acquired through volunteering, internships and different work experiences abroad). The use of these instruments, as well as the validation of non-formal and informal learning, will be developed on the bases and principles of the HKO/CROQF.

The establishment of processes and systems for the recognition of acquired knowledge and skills, especially those resulting from non-formal and informal learning, is a long-term challenge for our community. By applying the principle of lifelong learning, envisaged by the HKO/CROQF and strategic EU documents, such a system will enable better horizontal and vertical progression and flexibility. According to the Croatian Qualifications Framework Act, the procedure of application, recognition and validation of previously acquired units of learning outcomes will be prescribed in detail by the Ordinance on Recognition and Validation of Non-formal and Informal learning. The procedure will also be conducted in accordance with appropriate programmes for validation of units of learning outcomes from the HKO/CROQF Register.

The introduction of the system will start after a careful analysis of positive and negative experiences from other countries.

OBJECTIVE 4: IMPROVE THE SYSTEM OF CONTINUING PROFESSIONAL DEVELOPMENT OF EDUCATIONAL STAFF

Professionals in early childhood and pre-school education, teachers, counsellors, school principals and other educational staff are faced with many new challenges and are expected to possess contemporary competences. Several European documents define a new competence profile for teachers and emphasise the need for their continuing professional development (Improving the Quality of Teacher Education, 2007¹⁵; On improving the quality of teacher education, 2008¹⁶; Common European Principles for Teacher Competences and Qualifications, 2010¹⁷; Supporting the Teaching Professions for Better Learning Outcomes, 2012¹⁸). Trainers and mentors will need to have specific competences to be able to impart practical knowledge and skills, while career counsellors will

need to have knowledge of psychology and a broad understanding of the labour market. School principals will be expected to have organisational, managerial and financial skills, in addition to teaching experience.

Digital sources of knowledge are becoming increasingly accessible to students and adults. Teachers, counsellors, mentors and trainers therefore need to develop the ability to introduce new approaches through information and communication technologies (and related tools) and create new digital educational content. For this reason, continuing professional development will be vital for all teachers and educational staff in the process of identifying, developing and guiding the knowledge, skills and abilities of individuals.

In Croatia, no detailed analysis or recommendations have been developed yet on the content of basic occupations and on the competences required by professionals in early childhood and pre-school education, teachers, school principals, counsellors, mentors or trainers. This Strategy has therefore defined measures for the establishment of appropriate competence standards of occupations and qualifications at the levels of early childhood and pre-school education, primary education, secondary education and adult education. New programmes for the additional education of counsellors, mentors and trainers will result in the acquisition of partial qualifications for such occupations.

The establishment and improvement of a system of continuous lifelong development of teacher competences is defined and developed as a set of measures in the Strategy section related to the early childhood and pre-school education, primary education and secondary education (*Objective 4: Raise the quality of teaching and improve the status of the teaching profession*). The licensing of teachers and school principals is defined as a set of measures under Objective 5 (*Improve the quality of management of education institutions*), which include defining the role, the necessary competences, the basis for the institutionalisation of education, the programme and the procedures for such licensing.

Programmes for adult learners in the field of vocational education and training are predominantly conducted by teachers who are usually experts in their respective fields, but who are not sufficiently trained in methodology. Experts with rich experience are both useful and necessary staff members, but they should be further educated in the adult education field. After all, the Adult Education Act (article 10) states that adult educators have the right and the obligation of professional and adult education training. Since many of them have no formal qualifications for carrying out teaching activities, each programme related to the acquisition of qualifications should also define a desired competence profile of teachers and specify the modalities of recognition of previously acquired knowledge and skills. In the first phase of implementation of this Strategy, the licensing procedure in adult education will only be compulsory for teachers of primary-level adult education (in accordance with the





measures from the section of the Strategy on primary and secondary education). For other formal programmes in adult education, a project should be launched aimed at the development of necessary competences, organisational and financial preconditions, as well as procedures for the establishment and implementation of such a licensing system (see measure 1.1.3. of the Adult Education section of the Strategy).

Programmes of additional lifelong education for professionals in early childhood and pre- school education, teachers, counsellors and other educational staff will be carried out in accordance with pre-defined required competences, occupational standards and qualifications. For delivering programmes for continuing professional development of employees in education, a special measure is proposed within the Adult Education section of the Strategy (measure 1.1.4).

At the level of higher education, teaching staff have insufficient training on teaching methods and (more broadly) on adult education. In fact, most teaching assistants, lecturers, assistant professors and professors do not have such knowledge. Suitable programmes for their further education should be therefore developed and provided. Additionally, the Higher Education section of the Strategy proposes attendance of a mandatory programme of additional education in methodology and pedagogy as one of the conditions (criteria) for the appointment of a first teaching position. For existing teachers, higher education institutions can stimulate participation in such additional (optional) training by making it an element in the evaluation of the quality of the institution.

OBJECTIVE 5: BROADEN AND ENHANCE THE APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN EDUCATION AND LEARNING

E-learning provides temporally and spatially flexible access to up-to-date and current multimedia and interactive teaching materials. When integrated into teaching, it enables the dynamic use of Croatian and international repositories of educational content, digital libraries, archives and museums. Furthermore, information and communication technologies (ICT) provide modern opportunities of adjustment to personal learning styles, collaborative learning and acquiring skills for project work and teamwork, as well as providing access to a wider range of learners (learners with special needs, learners in remote locations, foreign learners, etc.). The expansion of e-learning increases the role and importance of teachers, as mentors, coordinators and instigators of the educational process. E-learning also places learners at the centre of the learning process, thereby encouraging them to take an active role and responsibility for their educational outcomes.

Some e-content is developed and is available as a support to the educational process in primary and secondary schools in Croatia, through the national web portal entitled 'Nikola Tesla'. Through this portal, CARNET provides information and infrastructural support to e-learning, as well as a system for managing educational content and a system for video-conferencing. In order to supplement these existing e-tools, the development of other tools for all levels of education should systematically be supported (e.g. reviewed e-books, multimedia demonstration lessons, exercises, simulations, expert systems for teaching, development of one's own software tools for e-learning, etc.).

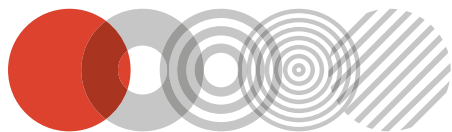
Teaching staff in higher education need to take on new commitments regarding the creation, development and review of such contents and resources for the level of primary, secondary and adult education.

A second planned group of activities is related to the creation and organisation of open repositories of knowledge and teaching resources (e.g. digitised books, lexicons, manuals, periodicals, heritage, various archival materials, scientific and professional articles). Systematic care should be taken to ensure the collection, preservation and permanent availability of such information, educational content and teaching resources. The concept of massive open online courses, consisting of large-scale free repositories of academic and other educational content (largely financed by private funds), could in the near future fundamentally change our approach to providing education. A justified concern that arises is that the neglect of didactic knowledge in current and future e-contents and resources (which are already competing or will compete for public funding) could result in their overproduction and problematic quality. For this reason, actions aimed at the encouragement and evaluation of e-contents and resources would address such a concern. In this process, the publishing industry (in the context of its restructuring in the media industry) will probably try to present such e-products as necessary and useful for financing from both the state budget and local budgets. Therefore, the formation of two groups of contents should be encouraged:

- free content, financed by public or EU funds;
- commercial content, which will require infrastructure for distribution and for implementation of peer-reviews.







EARLY CHILDHOOD AND PRE-SCHOOL EDUCATION, PRIMARY EDUCATION AND SECONDARY EDUCATION

The section of the Strategy covering early childhood and pre-school education, primary education and secondary education contains guidelines for the transformation and continuous enhancement of education as the foundation for the development of human potential. The baseline for the development of this Strategy was an analysis of the current state of the system. On this basis, priority development areas, specific strategic objectives and measures for their fulfilment have been defined.

This Strategy is related to the Strategic Framework for European Cooperation in Education and Training.¹⁹ In accordance with this strategic framework, special emphasis has been placed upon the following priorities: strengthening the adoption of and support for the concept of lifelong learning; enhancing the quality and effectiveness of education and training; promoting equality, social cohesion and active citizenship; and strengthening creativity and innovation at all levels and in all types of education.

Furthermore, the Strategy takes into consideration the European Commission's new strategic framework for education (Rethinking Education, 2012^{20, 21}). Despite difficult economic circumstances, the European Commission strongly highlights the importance of investing in education and in the development of skills that are necessary for effective adaptation to changeable living conditions, for employment and for better socio-economic outcomes. It also places special emphasis on the enhancement of the quality of pre-school and school education, the prevention of early school leaving, the better harmonisation of education and training with the labour market, the improvement of educational outcomes and life skills, and strengthening vocational education and training with a focus on linking it with the world of work.

In this Strategy, the proposed vision of education places the child/student at the centre of the process: the education system must provide the child/student with the best possible conditions and support for successful learning and for comprehensive personal development. The type of education that is promoted is education that actively fosters the comprehensive individual development of every child and young person; that promotes social equality and democratic values; and that greatly



contributes to the social and economic development of the country. The aim is to establish an education system that enables every person to acquire the knowledge, skills and attitudes necessary for a successful life in contemporary society.

The proposed modifications lead towards establishing a system that should enable every person to:

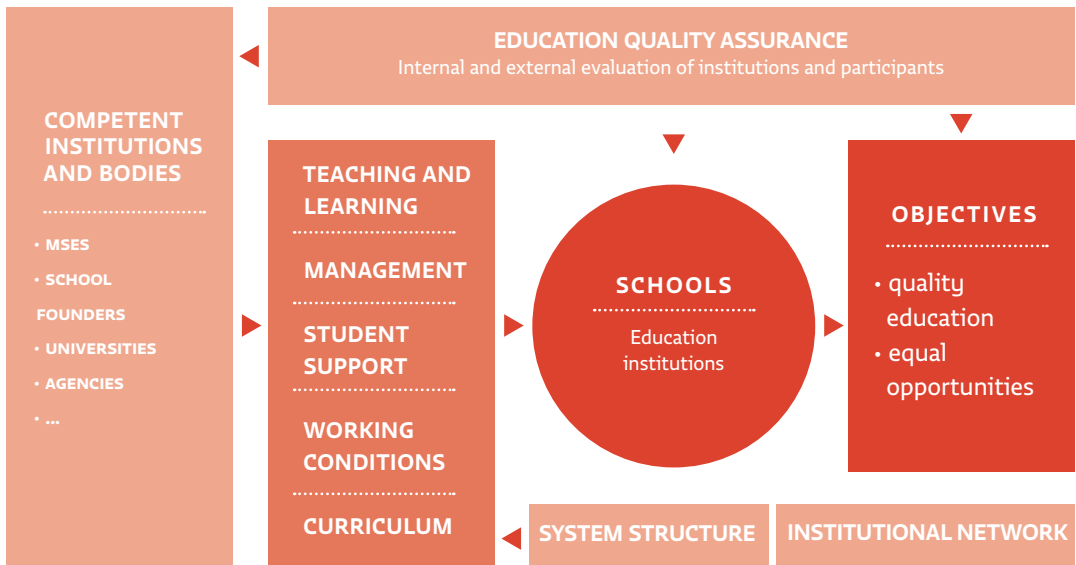
- develop the ability to participate actively in social and cultural events and become capable of accepting and participating in establishing a value system that is in line with the principles of contemporary democracy;
- become capable of communicating in a multicultural and multilingual community; be able to function in today's technically-developed society, fostering the active sustainable development movement, which presumes the acquisition of important knowledge and skills, especially in the area of mathematics, natural sciences, technology and information and communication technologies, as well as the social sciences and humanities;
- become capable of lifelong learning and continuous acquisition of new knowledge and skills essential for successful adaptation to changeable living and working conditions;
- develop one's personal creative potential and use it for one's own benefit and the benefit of society as a whole.

The starting point of this Strategy is the fact that, in the future, young people will work in certain jobs that do not yet exist. Technological changes will continue altering the world in ways that are yet unpredictable, whereas many challenges will demand major adjustments of the economy and of society. In such a world, which will be increasingly complex, it is essential for every child/student in the education system to develop a habit of learning and of acquiring new knowledge and skills in order to adapt to new challenges throughout their lifetime. There is also an ever-increasing need for people to be well-informed and well-educated in order to function successfully in society, as well as for democratic behaviour and tolerance to be developed in the earliest years of education. Every person must acquire the knowledge, skills and attitudes that will enable them to meet their cultural needs in a globalised intercultural environment, while at the same time respecting and nurturing their own cultural and historical heritage.

CONCEPTUAL FRAMEWORK

The education system is seen as a coherent unit in which all its participants and institutions — kindergartens, primary schools, grammar schools (gymnasia), vocational schools, arts schools and student dormitories — receive adequate support and have a high level of autonomy, but also assume great responsibility for the quality and outcomes of their work.

education institutions as the places where educational processes and human potential development take place. This conceptual model includes factors that have the greatest impact on the quality of education and on equal opportunities for all children and students:



In order for education institutions to accomplish their mission more efficiently, this Strategy focuses on strengthening human, material and organisational capacities, as well as curricular and structural changes. Along with the establishment of a quality assurance system, such measures can influence the achievement of better outcomes, of a higher degree of equity and of greater satisfaction of all participants in the education system.

One of the fundamental intentions of this Strategy is to initiate and provide the conditions for education institutions to develop into organisations that continually assume responsibility for ensuring their own quality (e.g. by creating and testing new forms of work). To achieve this, the level of regulation of their work needs to be lowered considerably in order to achieve an optimal level of institutional autonomy. More authority needs to be given to educational staff and institutions when making decisions regarding the curriculum, the organisation of teaching and learning, and the work of the school as a whole.

This strategic approach aims to establish a comprehensive, flexible and effective education system that links all levels and types of education into a coherent whole based on common positive values, principles and objectives, as specified in the National Curriculum Framework.²²

This Strategy aims to ensure that the education system attains the following characteristics:

- a culture of quality whose aim is to ensure continuous



development and enhancement of one's own work and the success of all participants in the education process;

- equal opportunities that enable all children and young people within the education system to achieve their full individual potential, in accordance with the Constitution of the Republic of Croatia and legal regulations, and independently of their sex, gender, national or social background, sexual or religious orientation, academic abilities or other characteristics;
- autonomy and responsibility enabling education institutions, educational staff (professionals in early childhood and pre-school education, teachers and other educational staff) and children/ students to achieve the best results in their own manner, while also remaining open to and ready for external evaluation of their own work;
- creativity and innovation as prerequisites for the development of creative thinking and expression at all levels, which implies searching for new and original ideas, explanations and solutions to problems; encouraging innovation among all participants in kindergartens, schools and everyday life.

The Strategy focuses on eight development areas:

- the enhancement of the development potential of education institutions;
- a comprehensive curricular reform that includes all levels and types of education;
- modifying the structure of primary education;
- improving the quality of teaching and enhancing the status of the teaching profession;
- improving the quality of management in education institutions;
- developing a comprehensive student support system;
- providing optimal working conditions for education institutions;
- establishing an education quality assurance system.

The fulfilment of these strategic objectives is expected to have a strong synergic impact that will significantly improve the current state of our kindergartens, schools and entire education system.

The strategic objectives will be fulfilled through the implementation of planned measures within the framework of coordinated projects in priority development areas.

OBJECTIVE 1: ENHANCE THE DEVELOPMENT POTENTIAL OF EDUCATION INSTITUTIONS

One of the main intentions of this Strategy in the area of early childhood and pre-school education, primary education and secondary education is to facilitate the transformation of education institutions into organisations that continually assume responsibility for ensuring their own quality and development. Such a transformation will unlock the innovative and developmental potential of schools, which provides a strong basis for improving the quality of education.²³ It will result in the ability of institutions to launch a range of projects and other activities to address current needs of participants in the educational process, as well as addressing concrete challenges faced by kindergartens, schools and student dormitories on a daily basis.

Currently, there is a low degree of school autonomy in Croatia, especially regarding the curriculum and the organisation of teaching and learning. This results in a situation in which innovation in schools is rare. The existing model of management in the education system clearly discourages the development of innovative processes in schools. This is primarily due to the numerous administrative obstacles encountered by any school that tries to introduce innovation into certain aspects of its work in order to address problems it faces or in order to improve quality.

The autonomy of education institutions is seen in this Strategy as an opportunity for self-regulation, as opposed to external governance by education authorities through regulations and decisions. Although it is not the only factor to consider, autonomy of education institutions is nevertheless essential for enhancing the development potential and overall work of education institutions.²⁴ It is therefore necessary to reach an optimal level of autonomy among education institutions, which is defined in this Strategy as the maximum level of freedom that education institutions can have while ensuring that an equally high level of quality of education exists throughout the whole system. Reaching an optimal level of autonomy in our education system means providing educational staff and education institutions with significantly greater authority and freedom. Autonomy should be provided primarily with regards to making decisions about the curriculum, but also with regards to decisions about the organisation of teaching and learning and about the work of the school as a whole.

- **MEASURE 1.1.** Reduce the level of regulation of educational and administrative activities of education institutions
COMPETENT BODY: MSES
IMPLEMENTATION: MSES
INDICATORS: Level of increase of institutional autonomy among education institutions. Number of areas of work for which decisions are made independently by teachers and education institutions.





Increasing the level of autonomy of education institutions will result in their increased accountability²⁵ and must therefore be accompanied by appropriate mechanisms for systematic support²⁶ Such support will primarily be provided by the key institutions of the education system (MSES, founders of education institutions, AZOO/ETTA, ASOO/AVETAE, NCVVO/NCEE).

Enhancing the development potential of education institutions requires specific support measures. These include relevant training in the area of educational innovations, as well as the establishment of mechanisms for cooperation between education institutions and for the exchange of experience and good practice. In addition, both expert and financial support must be provided to education institutions regarding the development, implementation and evaluation of innovation projects. Support will be provided by contracting experts (such as professionals from the scientific community, experienced practitioners, etc.) to assist the institution to work on its innovation project for a certain period of time. Financial support implies the provision of financial resources for development projects allocated to the institutions by means of a tender, on the basis of defined criteria and through the participation of a larger number of potential beneficiaries.

- **MEASURE 1.2** Provide the following to education institutions: (1) specific training of staff (2) opportunities for continuous cooperation and exchange of experience and good practice (3) expert and financial support in developing, implementing and evaluating innovation projects

COMPETENT BODY: MSES

IMPLEMENTATION: ASOO/AVETAE and AZOO/ETTA in cooperation with higher education institutions and other experts

INDICATORS: Number of implemented professional training programmes. Number of education institutions participating in activities regarding cooperation, exchange of experience and good practice in the area of educational innovations. Number of institutions implementing development projects and provided with expert and financial support.

OBJECTIVE 2: IMPLEMENT A COMPREHENSIVE CURRICULAR REFORM

Until the mid-2000s, the primary and secondary education system in Croatia was solely focused on educational content prescribed by syllabi. Since then, education policy has gradually tried to develop and introduce changes with the aim of modernising the system by shifting the focus from content to educational outcomes (learning outcomes)²⁷, as well as from an exclusive focus on transmitting content to the development of competences.

The strategic document Croatia in the 21st Century (2001) specified the need to implement a curricular reform that would include introducing changes in educational content and forms of teaching and learning. Similar goals were set in the document Education Sector Development Plan 2005–2010 (2005). The project 'Croatian National Educational Standard (CNES)' and the adoption of the new Syllabus for Primary Schools in 2006 launched qualitative changes at the primary school level regarding programme content. The Syllabus for Primary Schools determined, among other things, student educational achievements at the level of individual subjects and efforts were made to influence the way the educational process was implemented. At the secondary school level, particularly with regard to grammar school (gymnasium) programmes, there have been no significant programme changes since the mid- 1990s. Regarding early childhood and pre-school education institutions, their work was determined by the Pre-school Children Education Programme in 1991. The adoption of the Strategy for the Construction and Development of the National Curriculum for Pre-school Education, General Compulsory and Secondary School Education (2007) allowed for broader interventions in the education system. The National Curriculum Framework (NCF) is a document that aimed to achieve the alignment of different levels and types of education and that also adopted the European Framework for Key Competences for Lifelong Learning. The NCF also defined expected student achievements for each educational cycle at the level of education areas. Following intense and long discussions, the document was adopted by decision of the Minister in the second half of 2011.

In the Development Strategy for the Vocational Education System of the Republic of Croatia 2008–2013, the Agency for Vocational Education and Training and Adult Education (AVETAЕ) specified the focus on the development of competence- and learning-outcome- based qualifications as the first strategic objective. In line with that strategy, but also concurrently with the preparation of the NCF and independently of the strategy, the AVETAЕ launched a process (with the support of a number of IPA projects) for determining the methodology and preparation of occupational standards, qualifications and curricula for a number of vocational qualifications, whose experimental implementation began in the school year of 2013/2014.

Moreover, work on the preparation of the Croatian Qualifications Framework (CROQF) was intense during this period. The CROQF is a reform instrument for regulating the whole qualifications system at all education levels through occupational standards and qualifications standards based on learning outcomes and aligned with the needs of the labour market, individuals and society as a whole. The CROQF highlights the focus on the development of competences based on verifiable learning outcomes.

However, the planning and preparation of the above-mentioned education policy documents was not coordinated, which has had the following consequences:





- a) There are no commonly defined educational values, principles and objectives of different education levels and types.
- b) There is a lack of uniformity in the conceptual definition of the terms 'curriculum', 'competences' and particularly, 'educational outcomes' / 'learning outcomes' / 'student achievements'.
- c) There is a lack of coordination regarding the methodological approach to the preparation of curricula and to the determination of educational outcomes/learning outcomes/student achievements
- d) There is no coherent system for monitoring, evaluating and assessing/estimating the level of development and acquisition of educational outcomes/learning outcomes/student achievements. It follows that the level of connection between the different parts of the Croatian education system is inadequate, which may have a negative impact on the level of quality and equity in the system.

This review of key documents has demonstrated that, over the past 15 years, education policy has (regardless of political affiliation) tried to steer the strategic development of the system of early childhood and pre-school education, primary education and secondary education towards the development of competences, towards changing current forms of teaching and learning, and towards a clear focus on the need to define educational outcomes (learning outcomes). In the period covered by this Strategy, the continuity of this strategic direction will be ensured. Therefore, the aim of this section of the Strategy is the implementation of a comprehensive curricular reform and linking of the different parts of the education system into a coherent, interconnected, flexible and effective unit based on common educational values, principles and objectives.

The comprehensive curricular reform will focus on:

- a) the development of core competences for lifelong learning;
- b) clearly defined educational outcomes that do not solely belong to the cognitive domain (knowledge), but are also in line with the defined core competences for lifelong learning (the development of skills, attitudes of creativity, innovation, critical thinking, sense of initiative, entrepreneurship, aesthetic evaluation, responsibility, relationship to oneself, others and the environment, behaviour, etc.);
- c) open systems of methodology and didactics providing professionals in early childhood and pre-school education, teachers, children and students with the freedom to choose content, methods and forms of work;
- d) clearly defined standards/criteria for the level of development and acquisition of educational outcomes, which will provide the basis for a more objective, valid and reliable assessment by means of various forms

of internal and external evaluation.

The curricular solutions that need to be developed at all levels and in all types of education should be:

- scientifically-based, contemporary and child- and student-oriented;
- appropriate for the developmental age of the child/student;
- relevant for the current and future life of the child/student;
- open to changes and continuous review in accordance with the development of society,
- the economy, science, technology and education;
- and providing an adequate level of autonomy of education institutions and taking into consideration the autonomy of professionals in early childhood and pre-school education, teachers, school principals and other educational staff.

The NCF is a document that can serve as a basis for linking the different parts of the pre- tertiary education system into an inter-related, coherent unit. The values, objectives and principles defined in the NCF are taken into consideration in this Strategy. The educational values in question are the following:

KNOWLEDGE

Croatia is committed to the development of a knowledge-based society, because knowledge is the fundamental driver of production and development in a society. Knowledge, education and lifelong learning are crucial to the development of Croatian society and of every individual. They enable individuals to better understand and critically reflect on themselves and the society in which they live, to cope with new circumstances and to be successful in life and work.

SOLIDARITY

Solidarity implies systematically training children and youth to show concern for others, for the family, for the weak, the poor and the under-privileged, for inter-generational care, for the natural environment and for their overall living environment.

IDENTITY

Education fosters the strengthening of an individual's personal, cultural and national identity. Today, in the era of globalisation — in which there is a strong mix of different cultures, world views and religions — people need to become citizens of the world, while at the same time preserving their national identities, cultures and cultural landscapes, as well as their social, moral and spiritual heritage. The Croatian language in particular must be preserved and fostered, with an emphasis on the importance of its correct usage. Education must awaken, foster and develop one's personal identity — which includes accepting diversity. Special care will





be given to providing education in the language and script of national minorities, thereby ensuring the integration of minority education into the education system of Croatia.

RESPONSIBILITY

Education fosters the active participation of children and youth in social life and promotes their sense of responsibility for the well-being of society, nature and work, as well as a sense of responsibility for their own well-being and that of others. Responsible action and behaviour presumes a logical and responsible balance between personal freedom and personal responsibility.

The goals of the education system are as follows:

- providing a systematic approach to teaching that fosters and enhances the intellectual, emotional, physical, aesthetical, social, moral and spiritual development of students, in accordance with their abilities and aptitudes;
- developing student awareness regarding the preservation of the material, natural, spiritual, historical and cultural heritage of Croatia, as well as regarding Croatian national identity;
- promoting and developing awareness of the Croatian language as a key factor in Croatian identity, and systematically fostering the Croatian standard (literary) language in all areas, cycles and at all levels of the education system;
- educating students in line with general cultural and civic values, including those of human rights and children's rights, thereby rendering children competent to live in a multicultural world, to respect differences, to be tolerant and to participate actively and responsibly in the democratic development of society;
- ensuring that students acquire core (general educational) and vocational competences, enabling them to live and work in a continually changing social and cultural context in which they will need to meet the requirements of the market economy, of modern information and communication technologies, and of scientific knowledge and accomplishments;
- fostering and developing independence, self-confidence, responsibility and creativity of students;
- training students for lifelong learning.

The principles defined in the NCF, which constitute the baseline for the preparation of other curricular documents and which have been adopted in this Strategy, are as follows:

HIGH-QUALITY EDUCATION FOR ALL

Ensuring the conditions (material and technical resources, information and communication technologies and hygienic conditions) for the achievement of the highest educational standards, as well as high pro-

fessional standards of education institutions.

EQUAL EDUCATIONAL OPPORTUNITIES FOR ALL

All children and students are entitled to achieve their highest educational potential; the equality of educational opportunities is based on social justice; education and schooling cannot be privileges of a minority nor can they be limited due to differences on the basis of ethnicity, sex, gender or other socially conditioned differences.

COMPULSORY GENERAL EDUCATION

The acquisition of core competences is a right and an obligation of every individual, providing everyone with the fundamental knowledge that is necessary for life and that constitutes the basis for further learning.

HORIZONTAL AND VERTICAL MOBILITY

Providing the opportunity for students to change type of school during their education (horizontal mobility) and to pursue further education and complete a higher level of education (vertical mobility).

INCLUSION OF ALL STUDENTS IN THE EDUCATION SYSTEM

Taking into consideration the educational needs of every child, student and adult learner, especially those who are exposed to marginalisation and exclusion.

SCIENTIFIC FOUNDATION

Making changes and improvements to the whole education system in accordance with contemporary scientific knowledge.

RESPECT FOR HUMAN RIGHTS AND CHILDREN'S RIGHTS

Genuine respect for every child and individual and for human dignity.

PROFESSIONAL ETHICS AND COMPETENCE

Educational work implies great expertise of all education institutions and their high level of responsibility.

DEMOCRACY

Pluralism and democratic decision-making; inclusion of all key factors in the process of creating and implementing education policy.





INDEPENDENCE OF EDUCATION INSTITUTIONS

Ensuring a sufficient degree of freedom and independence of education institutions for planning their activities, programmes and projects (aimed at children, students, parents, professionals in early childhood and pre-school education, teachers and other educational staff) as part of their curricula, and of creating their education institution's identity. Ensuring freedom of choice of educational content, freedom to apply different methods and freedom to organise educational work in the process of implementing the National Curriculum.

PEDAGOGICAL AND SCHOOL PLURALISM

Degree of freedom and independence with respect to adopting different approaches to pedagogical and educational work.

EUROPEAN DIMENSION OF EDUCATION

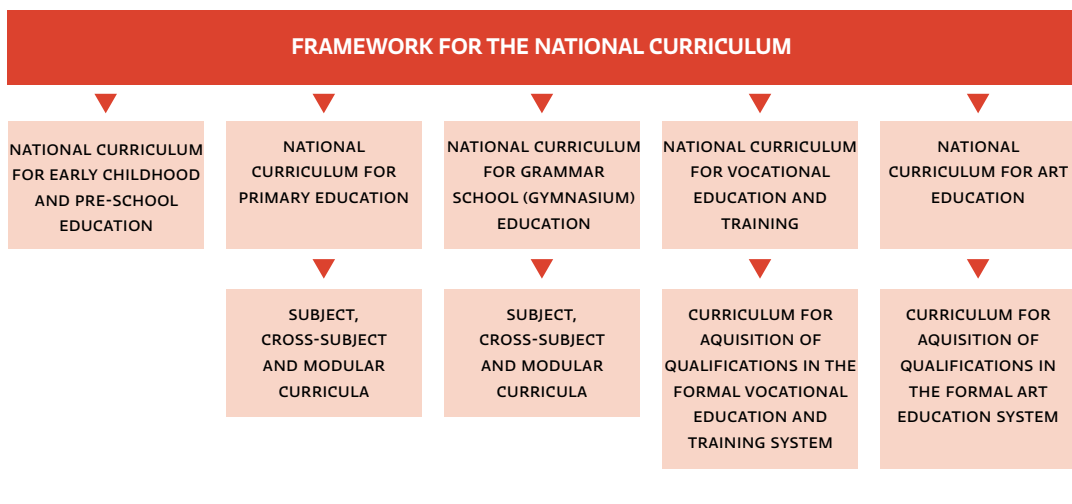
Training for European coexistence.

INTERCULTURALISM

Understanding and accepting cultural differences in order to reduce inequality and prejudice against people from other cultures.

DESCRIPTION OF THE COMPREHENSIVE CURRICULAR REFORM

The preliminary steps towards a comprehensive curricular reform include the revision and updating of the NCF, as well as the harmonisation of different education policy documents.²⁸ In accordance with the Strategy for the Construction and Development of the National Curriculum for Pre-school Education, General Compulsory and Secondary School Education (p. 5), it is suggested that the new version of the document (which will be subject to public debate) be entitled the Framework for the National Curriculum. Based on this new document, national curricula will be prepared for different levels and types of education. National curricula will take into account the particularities and needs of the different levels and types of education, as well as develop subject curricula, cross-subject curricula and modular curricula, as well as curricula for the acquisition of qualifications in the formal vocational education and art education systems. These documents will be implemented, adjusted and further developed by education institutions, in accordance with the particularities of their own work and environment. In order to contribute their expertise and experience in the preparation of curricular documents, educational staff (professionals in early childhood and pre-school education, teachers and other educational staff) will also become largely involved in the process at all levels. The graph below shows the structure of the proposed curricular documents.²⁹



Along with the preparation of curricular documents, measures will be provided to ensure the conditions for their introduction into the education system. Additionally, a comprehensive system for internal and external monitoring, evaluation and assessment of educational outcomes will be developed. The following conditions are crucial for the successful introduction of the proposed curricular changes: providing high-quality and comprehensive training to professionals in early childhood and pre-school education and to teachers; meeting staff-related, infrastructural and material preconditions to help education institutions adapt to the application of curricular documents; and explaining the goal and purpose of the proposed curricular changes to educational staff, children, students, parents and the general public. Furthermore, it is crucial to establish systems for the support, monitoring and evaluation of the process of developing and introducing the curricula into the education system.

2.1. REVISION AND UPDATING OF THE NATIONAL CURRICULUM FRAMEWORK AND HARMONISATION OF DIFFERENT EDUCATION POLICY DOCUMENTS

The preliminary steps towards a comprehensive curricular reform are the revision and updating of the NCF (whose developmental character makes such revisions possible) and the harmonisation of different education policy documents. The NCF needs to be revised for the following reasons: a) the change in the structure of the education system proposed by this Strategy implies considerable changes of the NCF; b) due to the focus being mainly on general education, the NCF does not pay enough attention to early childhood and pre-school education and to different types of secondary education, which is why it is important to ensure equal representation of all parts of the system within the framework of the main strategic objective; c) student achievements in different education areas, which constitute the central part of the document, have not been



harmonised and equally developed, and they need to be supplemented and harmonised; d) in line with the proposed scheme for curricular documents, the student achievements as specified in the NCF need to be incorporated into national curricula for specific levels and types of education. On the basis of the proposed changes of the National Curriculum Framework and in accordance with the Strategy for the Construction and Development of the National Curriculum for Pre-school Education, General Compulsory and Secondary Education, the preparation of a Framework for the National Curriculum has been proposed.

The adoption of the Croatian Qualifications Framework Act and the preparation of vocational curricula for the acquisition of qualifications in the formal education system require the alignment of different education policy documents. This will allow all the parts of the education system to become an inter-related and coherent unit. In order for this specific objective to be fulfilled, an Expert working group for curricular reform implementation (EWG) needs to be established and its work needs to be launched. The main tasks of the group are to prepare a draft of the Framework for the National Curriculum and to implement the whole process of curricular reform. One of the key measures within this specific objective is to define a coordinated methodological approach to the preparation of all curricular documents.

- **MEASURE 2.1.1.** Establish an Expert working group for curricular reform implementation (EWG)
NADLEŽNOST: Posebno stručno povjerenstvo
COMPETENT BODY: Ad-hoc expert group
IMPLEMENTATION: Ad-hoc expert group
INDICATORS: Criteria and principles defined for establishing the EWG. Tender issued for the selection of EWG members. Commencement of EWG's work.
- **MEASURE 2.1.2.** Define a coordinated methodological approach to the preparation of curricular documents
COMPETENT BODY: MSES
IMPLEMENTATION: MSES, Expert working group for curricular reform
Implementation
INDICATORS: Development of a coordinated methodological approach to the preparation of curricular documents
- **MEASURE 2.1.3.** Prepare a proposal for the Framework for the National Curriculum
COMPETENT BODY: MSES
IMPLEMENTATION: MSES, Expert working group for curricular reform implementation
INDICATORS: Positive review of the Framework for the National Curriculum. Public debate held. Adoption of Framework for the National Curriculum.

2.2. DEVELOPMENT OF A SUPPORT SYSTEM FOR THE PREPARATION OF CURRICULAR DOCUMENTS AND FOR THE IMPLEMENTATION OF THE COMPREHENSIVE CURRICULAR REFORM

The development of a support system has often been a neglected part of planning changes in the education system. The experience of Croatia and other countries indicates that even well- devised changes can be unsuccessful if they do not receive systematic support for their preparation and (especially) for their introduction. Therefore, one of the key success factors for the preparation of curricular documents and for the implementation of the comprehensive curricular reform will be the development of an efficient support system. Two bodies will form the basis of that system. On the one hand, during the course of the preparation of curricular documents it will be necessary to establish a Unit for expert and administrative support for the preparation of curricular documents (UEAS), whose members would be employees of the ministry and agencies. On the other hand, the experimental and broader introduction of curricular documents into the education system will require the establishment of a Support network for the introduction of the curriculum. The tasks of such a regional network will include operational support for the introduction of the curriculum and intense communication with educational staff. The network could be based on the current network of the heads of county-level professional councils (established by the Education and Teacher Training Agency and the Agency for Vocational Education and Training and Adult Education). In order to both include parents and raise the awareness of the general public, it is necessary to actively promote the curricular approach and the proposed changes (including debating advantages and challenges) during the whole process.

- **MEASURE 2.2.1.** Establish a Unit for expert and administrative support for the preparation of curricular documents (UEAS)
COMPETENT BODY: MSES
IMPLEMENTATION: MSES, AZOO/ETTA, ASOO/AVETAE
INDICATORS: Commencement of the work of the Unit for expert and administrative support for the preparation of curricular documents
- **MEASURE 2.2.2.** Establish a Support Network for the introduction of curricular documents into the education system (SNI)
COMPETENT BODY: MSES
IMPLEMENTATION: MSES, AZOO/ETTA, ASOO/AVETAE
INDICATORS: Support Network established for the introduction of national and subject curricula into the education system
- **MEASURE 2.2.3.** Promotional activity with the aim of explaining the advantages of the curricular approach and the proposed changes to parents and to the public
COMPETENT BODY: MSES



IMPLEMENTATION: MSES

INDICATORS: Programme and plan prepared for promotional activities at the annual level. Programme for promotional activities implemented in accordance with the plan.



2.3. PROVISION OF PRECONDITIONS FOR THE PREPARATION OF CURRICULAR DOCUMENTS AND IMPLEMENTATION OF A COMPREHENSIVE CURRICULAR REFORM

The measures that will be taken for the fulfilment of this specific objective include the establishing of expert working groups for the preparation of national curricula for different levels and types of education (EWGs) and their training for the preparation of different curricular documents. A particularly important measure within this specific objective is the defining of a detailed structure of national curricula for primary, grammar school (gymnasium), vocational and art education, including both curricula for specific areas and subject/modular curricula.³⁰

- **MEASURE 2.3.1.** Establish and train expert working groups for the preparation of national curricular documents (EWGRS)
COMPETENT BODY: MSES
IMPLEMENTATION: MSES, Expert working group for curricular reform implementation (EWG)
INDICATORS: Criteria and principles defined for forming expert working groups for the preparation of national curricula for different levels and types of education (EWGRS). Members of EWGRS selected and appointed. Plan and programme prepared and trainings held for the EWGRS. Guidelines prepared for expert working groups for the preparation of curricula and manuals prepared for the application of curricular documents (intended for professionals in early childhood and pre-school education, teachers and other educational staff).
- **MEASURE 2.3.2** Prepare a proposal for area and subject/cross-subject/modular structure of national curricula for primary education and grammar school (gymnasium), vocational and art education
COMPETENT BODY: MSES
IMPLEMENTATION: Expert working group for curricular reform implementation (EWG)
INDICATORS: Proposal prepared for the area and subject/modular structure of national curricula and their timetable. Public debate held. Area and subject/modular structure adopted.

2.4. PREPARATION AND INTRODUCTION OF NATIONAL CURRICULA

PREPARATION AND INTRODUCTION OF THE NATIONAL CURRICULUM FOR EARLY CHILDHOOD AND PRE-SCHOOL EDUCATION

The work of early childhood and pre-school education institutions has been determined by the Pre-school Children Education Programme since 1991. Despite the fact that education policy has not attempted to regulate or modernise this part of the system for more than two decades, this does not mean that there have been no qualitative changes in the system. Many early childhood and pre-school education institutions have been actively keeping up to date with contemporary knowledge in their field and have been introducing innovative approaches to their work. In order to systematically influence the improvement of quality and the alignment of the early childhood and pre-school education system, a National Curriculum for Early Childhood and Pre-school Education (NCECPE) will be prepared and introduced.

This document will contain general goals, principles and guidelines for the development of institutional early childhood and pre-school education. It will promote pluralism of pedagogical ideas and concepts based on developmentally appropriate practice, as well as promote the autonomy and responsibility of every early childhood and pre-school education institution for their quality enhancement. During the preparation of the National Curriculum for Early Childhood and Pre-school Education, it will be crucial to take into consideration the following principles: a) the need to foster a comprehensive development and education of early childhood and pre-school children by using appropriate forms of support for the development of different competences of children, in accordance with their individual particularities and different developmental characteristics; b) the need for a personalised and flexible educational approach that can meet the different needs of children (physical, emotional, cognitive, social, communicative, etc.); c) the importance of play as a model for learning and a comprehensive development of early childhood and pre-school children, as confirmed by relevant research; d) the need to develop curricular solutions that will avoid 'the schoolification' of the educational process in early childhood and pre-school education institutions.

Along with the preparation and adoption of the National Curriculum for Early Childhood and Pre-school Education, the provision of staff-related, infrastructural and material preconditions will be essential for the successful introduction of the proposed changes. Manuals for the application of the National Curriculum for Early Childhood and Pre-school Education will be prepared for professionals in early childhood and pre-school education, school principals and other educational staff. Systematic training of staff from early childhood and pre-school education institutions will also be conducted. Additionally, teams will be formed in early childhood and pre-school education institutions to coordinate



the introduction and application of the National Curriculum at the institutional level. Together with the preparation of curricular documents, a system will be developed to continuously monitor of the introduction of the National Curriculum.



PREPARATION AND INTRODUCTION OF THE NATIONAL CURRICULUM AND SUBJECT/CROSS-SUBJECT/MODULAR CURRICULA FOR PRIMARY EDUCATION (LASTING EIGHT AND NINE YEARS)

Compared to the education systems of the member countries of the Organisation for Economic Cooperation and Development (OECD), whose students have been achieving above-average results in international assessments of knowledge and skills, the Croatian primary education system could be described as a highly-centralised and traditional system, with a rigid subject structure and timetable. In addition, the drawbacks of the system are a fairly low level of horizontal and vertical subject relatedness and the fact that educational content is too detailed and insufficiently contemporary and relevant for students. Primary education in Croatia is also characterised by the fact that education areas are not equally represented. This does not allow for a comprehensive development of the student's personality, i.e. their cognitive, emotional, social, aesthetical, ethical, physical and motor development. Finally, the high centralisation of the system does not provide an adequate level of autonomy of schools or educational staff, which would otherwise positively affect the development of students' individual abilities and interests. The changes announced by the Croatian National Educational Standard (CNES) project and the Syllabus for Primary Schools (2006) focused on the overcoming of some of the drawbacks mentioned.

This Strategy's central strategic orientation is towards the development of core competences and the definition of educational outcomes (learning outcomes), along with a proposed change in the structure of the education system, whereby general compulsory primary education would last nine years. Such a strategic orientation will enable considerable improvements in this part of the system. The extension of the duration of primary education will result in a more flexible subject structure and timetable, as well as a significantly higher level of school autonomy in terms of defining their own programmes, which will provide a greater individualisation and electivity level. Changing the structure of the education system is a complex and long process that will last for more than a decade. For this reason, the first step in the process will be to revise and update the current syllabi for primary education lasting eight years. In parallel, work will begin on developing on curricular documents for general compulsory education lasting nine years in accordance with the strategic orientation towards core competences, educational outcomes (learning outcomes) and new forms of monitoring, evaluation and assessment.

During the preparation of curricular documents it is essential to provide the following: a) a high level of coherence, openness and flexibility; b) a contemporary approach, ensuring education that is relevant for the present and future life of students and that is appropriate to the students' developmental age; c) equal representation of education areas: language and communication area; mathematics, science, technical and informatics area; social sciences and humanities area; art, physical education and health area; d) greater autonomy of teachers in their work, as well as fostering the application of teaching and learning methods that facilitate the active role of students in developing their own competences with teachers' support and in interaction with other students, i.e. in a social learning environment; e) the acquisition of fundamental knowledge in basic disciplines, primarily in the Croatian language, mathematics, foreign languages and natural sciences (Physics, Chemistry, Biology and Geography); f) the introduction of new content that will develop literacy in information and communication technologies, finance and media; g) continued support for child media programmes in kindergartens, primary and secondary schools, as well as fostering the development of new school media projects; h) the introduction of civic education into education institutions to ensure the development of civic competence for all students.

The measures for this specific objective include the preparation and adoption of a National Curriculum for Primary Education and the preparation and adoption of subject, cross-subject and modular curricula for education lasting eight and nine years. In preparing subject, cross-subject and modular curricula, teachers must constitute the majority of members participating in the working groups. Other key measures for the fulfilment of this objective include the provision of carefully planned and effective training for teachers, school principals and other educational staff for the application of curricular documents and changes in initial teacher education. In parallel to the preparation and adoption of curricular documents, what must also be launched is the provision of material, infrastructural and staff preconditions essential for the successful introduction of the curriculum for primary education lasting nine years.

DEVELOPMENT AND INTRODUCTION OF THE NATIONAL CURRICULUM AND SUBJECT/CROSS-SUBJECT/MODULAR CURRICULA FOR GRAMMAR SCHOOL (GYMNASIUM) EDUCATION

In contrast to certain changes introduced in primary education and vocational education and training, there have not been any significant changes in grammar school (gymnasium) education since the beginning of the 1990s in terms of its organisational structure and programmes. Grammar schools (gymnasia) are still characterised by traditional and subject-fragmented syllabus, having a very large number of compulsory subjects, a fixed subject structure and timetable, and very low and





inadequate electivity. The syllabi focus exclusively on content and are overloaded, which significantly hinders the planning and implementation of a student-centred educational process. The fact that the syllabi have not been updated for more than two decades clearly indicates the need for profound programmatic changes.

The changes in grammar school (gymnasium) education must therefore focus on the development of a national curriculum and subject/cross-subject/modular curricula for this type of secondary education. These curricula should be based on educational outcomes allowing for successful continuation of education at the level of higher education. The features of the curricula and the measures planned for fulfilling this objective are similar to those defined at the primary education level. It will be necessary to define a single core curriculum for all grammar school (gymnasium) programmes as well as specific modules for specific programmes that enable grammar school (gymnasium) education to be visibly diversified. It will also be essential to increase electivity of educational content, especially in the final grades. This will directly result in the clearer definition of grammar school (gymnasium) education and of individual schools, as well as in enabling students to acquire an education that is in line with their interests, abilities and aspirations towards higher education.

It is important to highlight that detailed project planning will be needed to identify possible models for increasing electivity. The impact of such changes on the staff-related, organisational and material working conditions must also be identified. As is the case with other levels and types of education, it is crucial that teachers form the majority of members participating in the working groups preparing curricular documents. Special attention must be paid to ensuring the timely and high-quality training of teachers and other educational staff.

DEVELOPMENT AND INTRODUCTION OF THE NATIONAL CURRICULUM AND CURRICULA FOR THE ACQUISITION OF QUALIFICATIONS IN THE VOCATIONAL EDUCATION AND TRAINING SYSTEM

Vocational education and training is a very important part of the education system and enrolls the majority of secondary education students. Compared to grammar school (gymnasium) and art education, vocational education and training is characterised by its natural and close connection with the labour market, as well as its function of social inclusion. Most vocational education and training programmes have not undergone any significant changes during the last two decades. The current programmes do not reflect the development of technologies and trends in professions, nor do they always reflect the needs of the labour market and the economy. Furthermore, vocational education and training in Croatia is characterised by a large number of different programmes and by their

narrow specialisation. It is important to stress the fact that students choose their profession at a relatively early age, especially when it comes to choosing narrowly specialised occupations aimed at the acquisition of a narrow scope of knowledge and skills. While part of vocational education and training (in accordance with EU recommendations) focuses on work-based learning (especially through vocational education and training for crafts), student education in most of the system takes place exclusively in education institutions, without any significant connections with the world of work. By adopting the HKO/CROQE and developing new learning outcome-based curricula for the acquisition of specific qualifications in vocational education and training (ASOO/AVETAE), the first steps have been made in terms of qualitative changes in this part of the system. Considering the complexity and specificity of the vocational education and training system, following the adoption of this Strategy, a special Programme for the development of the vocational education and training system will be prepared, which will define the forms of realisation of the set strategic guidelines in more detail.

In order to determine the common values, principles and goals for all forms of vocational education and training, a National Curriculum for Vocational Education and Training will be developed and introduced. This document will define the ratios of general educational, professional and core competences, and will provide a framework for ensuring electivity and modularity in vocational education and training. It will also ensure the basis for the development and introduction of curricula for the acquisition of qualifications in the formal education system.

The principles to be observed during the preparation of the National Curriculum for Vocational Education and Training are the following: a) the flexibility of vocational education and training through electivity and modularity; b) the acquisition of fundamental knowledge and skills and of broader professional competences during the first grades of four-year vocational programme education; the possible postponement of vocational differentiation (depending on the occupation) to the final grades, thus ensuring a timely orientation of students and increasing the flexibility of the future workforce; c) ensuring the relevance of vocational education and training by following the standardised procedure stipulated by the HKO/CROQE, i.e. by conducting surveys on labour market needs and by ensuring a tripartite social partnership in the procedures for the preparation of occupational standards and qualifications standards; d) provision of general educational and core competences as the basis for further education and lifelong learning in all forms of vocational education and training; e) gradual introduction of work-based learning models in all forms and types of vocational education and training. Work-based learning could take place in different ratios depending on the vocational qualification, thus increasing the relevance of vocational education and training and facilitating the transition from education to the labour market; f) predict the needs for staff profiles (thus affecting the enrolment quota and education programmes provided by schools) by preparing and introducing





prediction models on the basis of the analyses of the needs, plans and trends in vocational sectors at the county, regional and national levels; g) enabling the transition from vocational education and training to various forms of higher education through additional education programmes and by removing obstacles and 'dead ends' in education.

The measures planned for the fulfilment of this specific objective are similar to those applied in other types and levels of education. Nevertheless, it is important to highlight the need to follow a special methodology for the preparation of curricula. The methodology should be based on defining occupational standards and qualifications standards, following which the curriculum for vocational qualifications in the formal education system can be prepared. The business sector and other stakeholders must play a major role in the whole process. Moreover, it is essential to stress the active role of schools regarding the development and modification of the curriculum for the acquisition of vocational qualifications. Finally, it is necessary to develop a suitable model for vertical mobility of students attending three-year vocational programmes.

DEVELOPMENT AND INTRODUCTION OF THE NATIONAL CURRICULUM AND CURRICULA FOR THE ACQUISITION OF QUALIFICATIONS IN THE FORMAL ART EDUCATION SYSTEM

Art education, which takes place at the primary and secondary school level in Croatia, is a valuable part of the education system. Artistic expression and art education must be actively promoted and fostered in all types and at all levels of the system. In line with the comprehensive curricular reform, it is necessary to prepare and introduce a National Curriculum for Art Education and curricula for the acquisition of qualifications in formal art education. During the preparation of curricular documents it is important to ensure a high level of coherence, openness and flexibility. It is also important to respect the particularities of individual art disciplines and to ensure that the content is appropriate for the developmental age and predispositions of children and young persons, which often vary. In secondary art education, it is essential to ensure an adequate share of general educational content in order for students to be able, upon completion of the programme, to continue their education in study programmes in a range of different fields, and not only in the field of art.

A) MEASURES FOR A COMPREHENSIVE CURRICULAR REFORM RELATING TO ALL EDUCATION LEVELS AND TYPES

- **MEASURE 2.4.1.** Prepare national curricula for early childhood and pre-school education, primary education, grammar school (gymnasium) education, vocational education and art education

COMPETENT BODY: MSES

IMPLEMENTATION: Expert working groups for the preparation of

national curricula; Expert working group for curricular reform implementation; Unit for expert and administrative support for the preparation of curricular documents

INDICATORS: Proposals for national curricula prepared and positively reviewed. Adoption of the following national curricula: the National Curriculum for Early Childhood and Pre-school Education; the National Curriculum for Primary Education; the National Curriculum for Grammar School (Gymnasium) Education; the National Curriculum for Vocational Education and Training; and the National Curriculum for Art Education.

- **MEASURE 2.4.2.** Establish and train working groups for the preparation of subject/modular curricula in primary and grammar school (gymnasium) education and working groups for the preparation of curricula for the acquisition of qualifications in formal vocational and art education

COMPETENT BODY: MSES

IMPLEMENTATION: Expert working groups for the preparation of national curricula; experts for the preparation of curricula; Expert working group for curricular reform implementation; Unit for expert and administrative support for the preparation of curricular documents

INDICATORS: Criteria and principles defined for establishing working groups. Tender issued for the selection of working group members, their selection and appointment. Training syllabus prepared. Trainings held.

- **MEASURE 2.4.3.** Prepare subject/modular curricula in primary and grammar school (gymnasium) education and curricula for the acquisition of qualifications in formal vocational and art education

COMPETENT BODY: MSES

IMPLEMENTATION: MSES; expert working groups for the preparation of national curricula; working groups for the preparation of subject/modular curricula and curricula for the acquisition of qualifications in vocational and art education; Expert working group for curricular reform implementation; Unit for expert and administrative support for the preparation of curricular documents

INDICATORS: Preparation of subject/modular curricula in primary and grammar school (gymnasium) education and curricula for the acquisition of qualifications in formal vocational and art education. Positive review and adoption of the subject/modular curricula.

- **MEASURE 2.4.4.** Inform and train professionals in early childhood and pre-school education, teachers, school principals and other educational staff for the application of curricular documents

COMPETENT BODY: MSES

IMPLEMENTATION: Expert working groups for the preparation of national curricular documents; working groups for the preparation of subject/modular curricula and curricula for the acquisition of





qualifications in formal education; ASOO/AVETAE; AZOO/ETTA; HOK/CCTC; experts from the curriculum area; Unit for expert and administrative support for the preparation of curricular documents
INDICATORS: Manuals for the application of curricular documents (intended for professionals in early childhood and pre-school education, teachers, school principals and other educational staff) are prepared and reviewed. Syllabus for informing and training is prepared. Trainings held.

- **MEASURE 2.4.5.** Evaluate textbooks and teaching and learning support materials in relation to curricular documents
COMPETENT BODY: MSES
IMPLEMENTATION: MSES; expert working groups for the preparation of national curricular documents; working groups for the preparation of subject/modular curricula and curricula for the acquisition of qualifications in formal education; Expert working group for curricular reform implementation; Unit for expert and administrative support for the preparation of curricular documents
INDICATORS: Guidelines prepared and adopted for the production and evaluation of textbooks and other education materials, in accordance with curricular documents. Tender issued for textbooks and other education materials.
- **MEASURE 2.4.6.** Provide the staff-related, infrastructural and material preconditions for education institutions to adapt to the application of curricular documents
COMPETENT BODY: MSES; local and regional self-government units
IMPLEMENTATION: MSES; local and regional self-government units
INDICATORS: Analytical assessment of staff-related, infrastructural and material needs. Education institutions provided with adequate conditions for introducing curricular documents.
- **MEASURE 2.4.7.** Evaluate the application of the National Curriculum for Early Childhood and Pre-school Education, of subject/modular curricula in primary and grammar school (gymnasium) education and of curricula for the acquisition of qualifications in formal vocational education and training
COMPETENT BODY: NCVVO/NCEE
IMPLEMENTATION: NCVVO/NCEE; schools; universities and public research institutes; Unit for expert and administrative support for the preparation of curricular documents; Support network for the introduction of curricular documents into the education system
INDICATORS: Evaluation system developed. Scientific evaluation carried out on the introduction of subject/modular curricula in primary and grammar school (gymnasium) education and curricula for the acquisition of qualifications in formal vocational education and training.

B) MEASURES FOR EARLY CHILDHOOD AND PRE-SCHOOL EDUCATION

- **MEASURE 2.4.8.** Experimental introduction of the National Curriculum for Early Childhood and Pre-school Education **COMPETENT BODY:** MSES
IMPLEMENTATION: Expert working group for the preparation of the national Curriculum for Early Childhood and Pre-school Education; teams of early childhood and pre-school education institutions; local and regional self-government units; universities and public research institutes; Unit for expert and administrative support for the preparation of curricular documents; Support network for the introduction of curricular documents into the education system
INDICATORS: Detailed syllabus prepared for the experimental introduction of the National Curriculum for Early Childhood and Pre-school Education into the education system. Kindergarten teams formed. Experimental implementation of the national Curriculum for Early Childhood and Pre-school education. Scientific and expert evaluation of experimental introduction carried out.
- **MEASURE 2.4.9.** Apply the national Curriculum for Early Childhood and Pre-School Education
COMPETENT BODY: MSES, local and regional self-government units
IMPLEMENTATION: Local and regional self-government units; AZOO/ETTA; expert working group for the preparation of the National Curriculum for Early Childhood and Pre-school Education, Unit for expert and administrative support for the preparation of curricular documents; Support network for the introduction of curricular documents into the education system; teams of early childhood and pre-school education institutions
INDICATORS: Early childhood and pre-school education institutions work in accordance with the National Curriculum for Early Childhood and Pre-school Education

C) MEASURES FOR PRIMARY EDUCATION LASTING EIGHT AND NINE YEARS

- **MEASURE 2.4.10.** Apply the revised subject/cross-subject/modular curricula for primary education lasting eight years
COMPETENT BODY: MSES
IMPLEMENTATION: MSES; expert working group for the preparation of the National Curriculum for Primary Education; working groups for the preparation of subject/cross-subject/modular curricula; Expert working group for curricular reform implementation; Unit for expert and administrative support for the preparation of curricular documents; Support network for the introduction of curricular documents into the education system
INDICATORS: Detailed syllabus prepared for the introduction of subject/cross-subject/modular curricula. School teams established





for the introduction of subject/cross- subject/modular curricula. Subject/cross-subject/modular curricula introduced.

- **MEASURE 2.4.11.** Experimental introduction of the National Curriculum and subject/cross- subject/modular curricula for general education lasting nine years

COMPETENT BODY: MSES

IMPLEMENTATION: MSES; Expert working group for the preparation of the National Curriculum for Primary Education; working groups for the preparation of subject/cross- subject/modular curricula, Expert working group for curricular reform implementation; Unit for expert and administrative support for the preparation of curricular documents; Support network for the introduction of curricular documents into the education system

INDICATORS: Detailed syllabus prepared for the experimental introduction of the National Curriculum and subject/cross-subject/modular curricula for general education lasting nine years into the education system. School teams established. Experimental implementation carried out of the National Curriculum and subject/cross-subject/modular curricula for general education lasting nine years. Scientific and expert evaluation of experimental implementation.

- **MEASURE 2.4.12.** Apply the National Curriculum and subject/cross-subject/modular curricula for general education lasting nine years

COMPETENT BODY: MSES

IMPLEMENTATION: MSES; AZOO/ETTA; Expert working group for the preparation of the National Curriculum for Primary Education; Unit for expert and administrative support for the preparation of curricular documents; Support network for the introduction of curricular documents into the education system; school teams

INDICATORS: All schools have started working in accordance with the National Curriculum and subject/cross-subject/modular curricula for general education lasting nine years

D) MEASURES FOR GRAMMAR SCHOOL (GYMNASIUM) EDUCATION

- **MEASURE 2.4.13.** Develop a model for increasing electivity in grammar school (gymnasium) education and influencing the working conditions and number of employed teachers

COMPETENT BODY: MSES

IMPLEMENTATION: MSES; universities and public research institutes; Unit for expert and administrative support for the preparation of curricular documents

INDICATORS: Analytical procedures implemented. Model developed for increasing electivity in grammar school (gymnasium) education and for influencing the working conditions and number of employed teachers.

- MEASURE 2.4.14.** Experimental introduction of the National Curriculum and subject/modular curricula for grammar school (gymnasium) education
 COMPETENT BODY: MSES
 IMPLEMENTATION: Expert working group for the preparation of the National Curriculum for Grammar School (Gymnasium) Education; working groups for the preparation of subject/modular curricula; Unit for expert and administrative support for the preparation of curricular documents; Support network for the introduction of curricular documents into the education system; school teams; local and regional self-government units
 INDICATORS: Detailed syllabus prepared for the experimental introduction of the National Curriculum and subject/modular curricula for grammar school (gymnasium) education into the education system. School teams established for the introduction of the National Curriculum and subject/modular curricula for grammar school (gymnasium) education. Experimental implementation carried out of the National Curriculum and subject/modular curricula for grammar school (gymnasium) education. Scientific and expert evaluation of experimental implementation.
- MJERA 2.4.15.** Apply the National Curriculum and subject/modular curricula for grammar school (gymnasium) education
 COMPETENT BODY: MSES
 IMPLEMENTATION: MSES; Expert working group for the preparation of the National Curriculum for Grammar School (Gymnasium) Education; working groups for the preparation of subject/modular curricula; Unit for expert and administrative support for the preparation of curricular documents; Support network for the introduction of curricular documents into the education system; school teams; local and regional self-government units
 INDICATORS: All schools have started working in accordance with the National Curriculum and subject/modular curricula for grammar school (gymnasium) education.

E) MEASURES FOR VOCATIONAL EDUCATION AND TRAINING

- MEASURE 2.4.16.** Prepare and adopt a programme for the development of the vocational education and training system
 COMPETENT BODY: MSES
 IMPLEMENTATION: MSES, ASOO/AVETAE, other ministries responsible for vocational education and training, HGK/CCE, HZZ/CES and HOK/CCTC
 INDICATORS: Programme adopted for the development of the vocational education and training system
- MEASURE 2.4.17.** Experimental introduction of the National Curriculum for Vocational Education and Training and curricula for





the acquisition of qualifications in formal vocational education and training into the education system

COMPETENT BODY: MSES

IMPLEMENTATION: Expert working group for the preparation of the National Curriculum for Vocational Education and Training; working groups for the preparation of curricula for the acquisition of qualifications in formal vocational education and training; ASOO/AVETAE; HKO/CROQE; Unit for expert and administrative support for the preparation of curricular documents; Support network for the introduction of curricular documents into the education system; school teams; local and regional self-government units

INDICATORS: Detailed syllabus developed for the experimental introduction of the National Curriculum for Vocational Education and Training and curricula for the acquisition of qualifications in formal vocational education and training. School teams established for the introduction of the National Curriculum for Vocational Education and Training and curricula for the acquisition of qualifications in formal vocational education and training. Experimental implementation carried out of the National Curriculum for Vocational Education and Training and of curricula for the acquisition of qualifications in formal vocational education and training. Scientific and expert evaluation of experimental implementation.

- **MJERA 2.4.18.** Apply the National Curriculum for Vocational Education and Training and curricula for the acquisition of qualifications in formal vocational education and training

COMPETENT BODY: MSES, ASOO/AVETAE, HOK/CCTC

IMPLEMENTATION: Expert working group for the preparation of the National Curriculum for Vocational Education and Training; working groups for the preparation of curricula for the acquisition of qualifications in formal vocational education and training, ASOO/AVETAE; HKO/CROQE; Unit for expert and administrative support for the preparation of curricular documents; Support network for the introduction of curricular documents into the education system; school teams: local and regional self-government units

INDICATORS: Vocational schools have started working in accordance with the National Curriculum for Vocational Education and Training

- **MEASURE 2.4.19.** Prepare the optimal model for the implementation of work-based learning in vocational schools

COMPETENT BODY: MSES, ASOO/AVETAE, HOK/CCTC, HUP/CEA, HGK/CCE

IMPLEMENTATION: Universities and public research institutes; Unit for expert and administrative support for the preparation of curricular documents

INDICATORS: Analyses made of the possibilities of businesses to organise work-based learning. Analysis made of the current work-based learning system in vocational education and training lasting

three years. Optimal implementation model defined.

- **MJERA 2.4.20.** Develop a model for vertical mobility of students attending three-year vocational schools
COMPETENT BODY: MSES, ASOO/AVETA
IMPLEMENTATION: MSES, universities and public research institutes
INDICATORS: Model developed for vertical mobility of students attending three-year vocational schools

F) MEASURES FOR ART EDUCATION

- **MEASURE 2.4.21.** Experimental introduction of the National Curriculum for Art Education and curricula for the acquisition of qualifications in formal art education into the education system
COMPETENT BODY: MSES, Ministry of Culture
IMPLEMENTATION: Expert working group for the preparation of the National Curriculum for Art Education; working groups for the preparation of curricula for the acquisition of qualifications in formal art education; Unit for expert and administrative support for the preparation of curricular documents; Support network for the introduction of curricular documents into the education system; school teams; local and regional self-government units
INDICATORS: Preparation of a detailed syllabus for the experimental introduction of the National Curriculum for Art Education and curricula for the acquisition of qualifications in formal art education. School teams established. Experimental implementation carried out of the National Curriculum for Art Education and curricula for the acquisition of qualifications in formal art education. Scientific and expert evaluation of experimental implementation.
- **MEASURE 2.4.22.** Apply the National Curriculum for Art Education and curricula for the acquisition of qualifications in formal art education
COMPETENT BODY: MSES and Ministry of Culture
IMPLEMENTATION: Expert working group for the preparation of the National Curriculum for Art Education; working groups for the preparation of curricula for the acquisition of qualifications in formal art education; Unit for expert and administrative support for the preparation of curricular documents; Support network for the introduction of curricular documents into the education system; school teams; local and regional self-government units
INDICATORS: Arts schools start working in accordance with the National Curriculum for Art Education and curricula for the acquisition of qualifications in formal art education





2.5. DEVELOPMENT AND INTRODUCTION OF A COMPREHENSIVE SYSTEM OF ASSESSMENT, GRADING AND REPORTING ON THE LEVEL OF THE ACQUISITION OF EDUCATIONAL OUTCOMES (LEARNING OUTCOMES)

Assessing, grading and reporting on student achievement at the primary and secondary school level are often the topic of discussion (and of misunderstanding) among experts and the general public. The problems identified in this part of the system are usually the non-existence of clear criteria and of an adequate level of objectivity in assessment and grading, resulting in negative learning patterns and low motivation of students. In comparison with developed education systems, there is a lack of formative assessment and a lack of systematic monitoring of students by using different types of assessment. Such assessments focus on identifying of the learning problems and challenges, with their main function being the modification of learning patterns and not necessarily the awarding of a grade. For the most part, assessment in the Croatian education system is summative assessment or the assessment of what the student has learned after a certain unit, in most cases resulting in a grade. Grading results almost exclusively in a number, while reporting is mostly conducted by means of providing information about the level of achievement, which is also expressed solely by a grade. It follows that the prevailing procedures of assessing, grading and reporting in Croatian education are inappropriate and do not clearly focus on the identification and rectification of flaws made by students in the learning process. Even in initial teacher education, insufficient attention is paid to this sensitive and important part of the education system.

In order to rectify the aforementioned flaws and achieve the main strategic objective, a comprehensive system for monitoring, assessing, grading and reporting on the level of the acquisition of educational outcomes (learning outcomes) will be developed.

The comprehensive system must be developed on the basis of the following principles: a) the main purpose of all forms of monitoring, assessment, grading and reporting is the enhancement of students' learning; b) transparency and clearly defined criteria for the level of acquisition of educational outcomes as defined in curricular documents will facilitate more objective, valid and reliable monitoring, assessment and grading; c) the use of procedures that do not place certain students or groups into a privileged position; d) the use of procedures that are useful to all students notwithstanding their special needs and other particularities; e) carefully planned procedures that are in accordance with curricula based on educational outcomes; f) clear and timely communication with students and parents prior to the commencement and during the course of the school year about assessment, grading and reporting; g) frequent assessments, varying by nature and carried out during the course of the whole school year, which would enable students to demonstrate their abilities and the acquired knowledge and skills they have acquired; h) descriptive feedback

that is clear, specific, timely and student-oriented in order to influence students' learning; i) the development of skills of self-assessment whose aim is to assess one's own learning, set learning objectives, plan and organise learning; j) the avoidance of high-stakes external examinations, with the exception of the current State Matura examinations taking place at the end of secondary education.

The measures that will be implemented to fulfil this objective include the defining of criteria (standards) for all parts of the pre-tertiary education system. In the process of preparing curricular documents, a strong emphasis will be placed on defining educational outcomes. This will facilitate the definition of criteria/standards, which in turn will determine how to assess the level of acquisition of the set educational outcomes. Overall, this will result in more objective and reliable grading. It is equally important to develop different models of formative monitoring and assessment at all levels and in all types of the education system. In addition, one of the specific measures is the development of hybrid assessment and grading models that combine external and internal evaluation. Using such an innovative model, the National Centre for External Evaluation of Education (NCVVO/NCEE) prepares standardised tasks of controlled quality characteristics, on the basis of educational outcomes (learning outcomes) and for every subject. Teachers may use these tasks in written examinations at any moment and in any manner they wish. Upon obtaining the information about the success of their students, teachers receive data on their students' achievements with respect to different features of the tasks and receive a comparison with the results achieved at a certain location level. This has an impact on ensuring more objective grading, on raising the quality of examination materials and on the quality of feedback. At the same time, teachers are further trained in the area of assessment and grading. The teacher thereby remains the key individual in terms of monitoring, assessing and grading of student achievements. The education system can thus have a detailed overview of the level of the acquisition of learning outcomes at the national level. This form of assessment is limited to written examinations that are used in certain subjects only and, in line with the general principles of this strategic objective, the use of diverse forms and types of assessment is actively encouraged. New models, forms and patterns of reporting will be developed on the development of children in early childhood and pre-school education and on the achievement of educational outcomes in the primary and secondary education system. One of the key measures will be the training of teachers for new forms of assessing, grading and reporting, and the introduction of courses on assessing, grading and reporting into all study programmes of initial education of teachers and professionals in early childhood and pre-school education.

- **MEASURE 2.5.1.** Establish a unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as a part of the comprehensive curricular reform (AGR)

COMPETENT BODY: MSES





IMPLEMENTATION: MSES, NCVVO/NCEE, Unit for expert and administrative support for the preparation of curricular documents
INDICATORS: Criteria and principles defined for establishing the AGR. Members of the AGR selected and appointed.

- **MEASURE 2.5.2.** Define criteria (standards, levels of achievement) on the basis of curricular documents
COMPETENT BODY: MSES, NCVVO/NCEE
IMPLEMENTATION: Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as a part of the comprehensive curricular reform; expert working groups for the preparation of curricular documents; NCVVO/NCEE; Unit for expert and administrative support for the preparation of curricular documents
INDICATORS: Criteria (standards, levels of achievement) defined for all levels and types of education
- **MEASURE 2.5.3.** Develop different formative assessment models
COMPETENT BODY: MSES, NCVVO/NCEE
IMPLEMENTATION: Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as a part of the comprehensive curricular reform; NCVVO/NCEE; universities and public research institutes; Unit for expert and administrative support for the preparation of curricular documents
INDICATORS: Formative assessment models developed
- **MEASURE 2.5.4.** Prepare manuals on monitoring, assessing, grading and reporting for individual parts of the education system
COMPETENT BODY: MSES, NCVVO/NCEE
IMPLEMENTATION: Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as a part of the comprehensive curricular reform; NCVVO/NCEE; experts in the area of assessment and grading; Unit for expert and administrative support for the preparation of curricular documents
INDICATORS: Manuals prepared on assessing, grading and reporting for individual parts of the education system
- **MEASURE 2.5.5.** Prepare examination materials on the basis of educational outcomes defined in the curriculum
COMPETENT BODY: MSES
IMPLEMENTATION: Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as a part of the comprehensive curricular reform; NCVVO/NCEE; experts in the area of assessment and grading; Unit for expert and administrative support for the preparation of curricular documents
INDICATORS: Examination materials prepared
- **MEASURE 2.5.6.** Develop hybrid models for assessment and grading
COMPETENT BODY: MSES, NCVVO/NCEE

IMPLEMENTATION: Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as a part of the comprehensive curricular reform; NCVVO/NCEE; universities; public research institutes; Unit for expert and administrative support for the preparation of curricular documents

INDICATORS: Model developed for hybrid models for assessment and grading

- **MEASURE 2.5.7.** Experimental introduction of the hybrid model for assessment and grading

COMPETENT BODY: MSES

IMPLEMENTATION: Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as a part of the comprehensive curricular reform; NCVVO/NCEE; AZOO/ETTA; ASOO/AVETAE; school teams; Unit for expert and administrative support for the preparation of curricular documents; CARNET

INDICATORS: Detailed syllabus prepared for experimental introduction of the hybrid model into the education system. School teams established. Experimental implementation carried out. Scientific and expert evaluation of experimental implementation.

- **MEASURE 2.5.8.** Prepare a new model for reporting on the development of children and the level of the acquisition of educational outcomes (learning outcomes)

COMPETENT BODY: MSES

IMPLEMENTATION: MSES; Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as a part of the comprehensive curricular reform; universities; public research institutes; Unit for expert and administrative support for the preparation of curricular documents

INDICATORS: Ordinances and manuals prepared on how to report on the development of children and on the level of their acquisition of educational outcomes (learning outcomes). Adoption of the model for reporting on the development of children and on the level of acquisition of educational outcomes (learning outcomes).

- **MJERA 2.5.9.** Train teachers, school principals and other educational staff on the application of new assessment, grading and reporting models

COMPETENT BODY: MSES

IMPLEMENTATION: Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as a part of the comprehensive curricular reform; AZOO/ETTA; ASOO/AVETAE; NCVVO/NCEE; MSES; Unit for expert and administrative support for the preparation of curricular documents

INDICATORS: Training syllabus prepared. Training programme carried out.



- **MEASURE 2.5.10.** Develop and introduce the ‘Assessing and grading’ course into all study programmes aimed at the education of future teachers
COMPETENT BODY: Universities
IMPLEMENTATION: Universities
INDICATORS: Courses developed and introduced.

2.6. DEVELOPMENT OF DIGITAL EDUCATIONAL CONTENT, TOOLS AND METHODS FOR THE USE OF ICT IN TEACHING AND LEARNING

The use of technology for enhancing the teaching and learning process is essential in the Croatian education system and is closely in line with educational development trends of the 21st century. EU Member States have been investing in the development of digital educational content at all levels of education for more than a decade through EU programmes such as Socrates, Minerva, eContent and the Lifelong Learning Programme (LLP). This opportunity was only given to Croatia after joining the LLP in 2009, and Croatian education institutions were eventually able to equally participate in centralised LLP programmes in 2010.

Although Croatia’s experience has not resulted in the development of comprehensive electronic content in the curriculum for primary and secondary education, some progress has nevertheless been made. In addition to education institutions and individuals taking their own initiatives to develop electronic content, a national-level initiative of the MSES has been launched to provide and store digital educational content related to mathematics and physics: the ‘Nikola Tesla’ National Distance-Learning Web Portal. However, the content of the web portal only covers part of the primary and secondary education curriculum and the materials have not been adapted to students with special needs. Therefore, additional content, tools and methods for the use of information and communication technologies (ICT) in teaching and learning must be developed and teachers must be trained in order to develop digital competences.

A prerequisite to achieving this objective is to define digital educational content standards. This includes defining pedagogical models for the application of ICT in teaching and learning, as well as models for the preparation of digital educational content (in particular using open educational resources). In addition to defining these models, it is necessary to invest in the development of digital educational content at all levels of education — primary education, secondary education (including vocational education and training) and higher education, as well as adult education and lifelong learning). The aim will be that 50 per cent of all educational content should be accessible in digital form by 2020, in accordance with adopted standards.

It is necessary to gather existing digital educational materials in one place and facilitate the preparation, development, use and distribution of digital educational resources. For this reason, a national repository

for digital multimedia educational content will be developed and established. Users of the national repository will be all participants in the educational process, from primary, secondary and higher education institutions through to research communities. The national repository should be the central place for the storage, preparation, distribution and evaluation of educational content, with the possibility of connecting to national repositories from Europe and the rest of the world.

It is also essential to invest in the training of teachers for the use of ICT in teaching (in order to develop their digital competences), as well as invest in and in ICT equipment at the individual school level for its application in teaching.

- **MEASURE 2.6.1.** Develop standards for digital educational content and the use of ICT in teaching and learning
COMPETENT BODY: MSES
IMPLEMENTATION: NCVVO/NCEE, AZOO/ETTA, ASOO/AVETAE
INDICATORS: Model proposed for using ICT in teaching and learning in Croatia
- **MEASURE 2.6.2.** Develop digital content for repositories aligned with curricular documents
COMPETENT BODY: Universities and research institutes, publishers, other relevant experts
IMPLEMENTATION: Universities and research institutes, publishers, other relevant experts
INDICATORS: Digital content developed for teachers to use in their work
- **MEASURE 2.6.3.** Develop programmes and train teachers for the use of ICT in teaching and learning and for the development of digital educational content
COMPETENT BODY: MSES
IMPLEMENTATION: AZOO/ETTA, ASOO/AVETAE, publishers
INDICATORS: Programmes developed. Number of teachers certified.
- **MEASURE 2.6.4.** Experimental application of different models for the use of ICT in teaching and learning
COMPETENT BODY: CARNET
IMPLEMENTATION: AZOO/ETTA, ASOO/AVETAE, universities, public research institutes
INDICATORS: Study developed on models for using ICT in teaching and learning. Evaluation of the application of different models. Proposal developed for solutions at the national level.



OBJECTIVE 3: MODIFY THE STRUCTURE OF PRIMARY EDUCATION

Changes in the structure of the education system — which are generally related to modifying the number of education levels, their duration or the time and manner of implementing career guidance for students to enrol in either grammar schools (gymnasia) or vocational schools — are rarely introduced in Croatia due to their complexity.

Since the 19th century, Croatian education has only undergone a few major structural changes, which have almost always been related to the extension of duration of the existing education levels. This Strategy envisages the extension of the general compulsory education from eight to nine years, which (by retaining the duration of secondary education) also implies the extension of the duration of pre-tertiary education as a whole. The comprehensive and complex nature of the proposed changes requires a political, professional and public consensus, as well as the mobilisation of the whole reform potential.

Compared to other EU Member States, Croatia currently has the shortest duration of compulsory education (Table 1³¹). The duration of general education of the whole student population is also one of the shortest (lasting eight years as opposed to the prevailing nine years). Lower primary education — in which all classes are mainly taught by a single teacher and whose main features are greater individualisation of teaching and a higher level of pupil-centred approaches — is also shorter and lasts four years as opposed to the prevailing six years (or five years, depending on the country). The entry of children into the formal education system at the average age of seven is also one of the latest in the EU. As a consequence, our students spend the shortest time in compulsory education.³²



Table 1. Average entry age into formal compulsory education and duration of compulsory education in EU Member States (Eurydice, 2013).

COUNTRY	AGE OF ENTRY INTO COMPULSORY EDUCATION	DURATION OF COMPULSORY EDUCATION	COUNTRY	AGE OF ENTRY INTO COMPULSORY EDUCATION	DURATION OF COMPULSORY EDUCATION
HUNGARY	5	11 (13)	ITALY	6	10
NETHERLANDS	5	13	CYPRUS	5	10
LUKSEMBURG	4	12	ROMANIA	6	10
PORTUGAL	6	12	SLOVAKIA	6	10
LATVIA	5	11	BULGARIA	6	9
MALTA	5	11	BUGARSKA	7	9
POLAND	5	11	CZECH REPUBLIC	6	9
VB – ENGLAND	5	11	AUSTRIA	6	9
VB – SCOTLAND	5	11	ESTONIA	7	9
DENMARK	6	10	LITHUANIA	7	9
GERMANY (5 STATES)	6	10	GERMANY (12 STATES)	6	9
IRELAND	6	10	SLOVENIA	6	9
GREECE	5	10	FINLAND	7	9
SPAIN	6	10	SWEDEN	7	9
FRANCE	6	10	CROATIA	7	8



The main reasons for changing the structure of the education system are as follows:

- providing better conditions for individuals to acquire the core competences for lifelong learning, for strengthening social cohesion and for preventing social exclusion;
- increasing the quality of educational outcomes at the national level. The results achieved by Croatian fifteen-year-olds in international knowledge assessments (PISA) are average or below-average. Results achieved in the State Matura examinations at the end of secondary education also indicate a lower level of acquisition of knowledge and skills in certain subjects;
- reducing inequality in the formal education system. One of the ways in which equity can be ensured in the education system is by reducing the impact that socioeconomic and cultural status of students' families has on differences in student educational achievement. In an international perspective, research on student populations has shown that the Croatian education system is not currently characterised by a high level of equity;
- increasing the competitiveness of Croatian society and the economy in a globalised context;
- facilitating more substantial changes in the pre-tertiary education system (primarily in the curriculum area), by increasing individualisation, electivity and autonomy of the work of education institutions, professionals in early childhood and pre-school education and teachers.

During the preparation of the proposals for structural changes, special attention has been paid to:

- the impact on the well-being of children and students;
- the level of adaptation to the Croatian context;
- the feasibility in terms of demographic factors, existing infrastructure and staff, as well as in terms of broader potential for changes;
- the positive impact on the level of competitiveness of society and the economy.

On the basis of the above-mentioned background, the following changes are proposed:

- reduction of the average age of entry into general compulsory education from seven to six years and six months;
- extension of general compulsory education as a whole from eight to nine years; extension of lower primary education from four to five years, with subject-teaching in general compulsory education lasting four years;
- retention of the current duration of secondary education;
- extension of pre-tertiary education as a whole by one year (as a result of the above changes).

The outcomes of the proposed changes will be the following:

- The age of entry into primary education will be reduced and children who reach the age of six by the first day of the school year (1st September) will enrol in the first grade of primary school. This means that the children who will enrol in the first grade will be between six and seven years of age. Earlier inclusion of children in the formal education system will affect the reduction of the impact of socioeconomic differences and will ensure the possibility of earlier acquisition of core competences. This in turn can positively affect the quality of educational outcomes and the level of competitiveness of society and the economy.
- Lower primary education will be extended from the current duration of four years to five years, thus increasing the level of individualisation in the system and ensuring the comprehensive development of pupils. This means that subject-teaching will start at a later age (between 11 and 12 years of age). The duration of subject-teaching at the primary and secondary school level remains unchanged, thus ensuring specialist teaching, continuity and tradition, as well as positively affecting the level of educational outcomes at the national level.
- The age of horizontal differentiation (i.e. the age when students choose between enrolling in grammar schools/gymnasia or vocational schools) will be postponed. It will take place between 15 and 16 years of age, due to the fact that the school year begins on 1st September. This change can have a positive impact on the level of equity in the system and it will positively affect the well-being of students, since they will be more mature to make decisions about their own education and career pathways. Consequently, a positive impact is expected on the level of competitiveness of society and the economy.
- The age of entry into higher education will be postponed and students attending grammar schools (gymnasia) and four-year vocational schools will enrol higher education institutions between 19 and 20 years of age. This will ensure a higher level of maturity of future students and will also increase the competitiveness of society and the economy.
- The age of entry into the labour market for students attending four-year vocational schools will be postponed, with the school year ending on 1st June. Students will therefore enter the labour market between the ages of 18 years and 9 months and 19 years and 9 months, thus ensuring that they are more competitive on the labour market and that the economy is also more competitive.
- The age of entry into the labour market for students attending three-year vocational schools will be postponed, with the school year ending on 1st June. Students will therefore enter the labour market between the ages of 17 years and 9 months and 18 years and 9 months, thus ensuring that they are more competitive on the labour market and that the economy is also more competitive. In addition, the fact that the majority of students will come of age upon completing



these programmes will positively affect the possibility of their equal inclusion in the labour market.

ADAPTING THE PROPOSED CHANGES TO THE CROATIAN CONTEXT



The proposal to introduce changes into the education structure has been adapted to the cultural particularities of Croatian society and to the characteristics of our education system. The inclusion of children in formal education six months earlier is a change that is considered as acceptable. It was estimated that proposing to include children at an earlier age into formal education could lead to parents' resistance. The extension of lower primary education to five years and the retention of a duration of four years' for subject-teaching has been adapted to the Croatian education system and, in particular, to the existing structure of initial teacher education.

FEASIBILITY OF THE PROPOSED CHANGES

Demographic data show a significant decrease in the number of children. The consequences of such a demographic trend are serious for education and for the structure of the education system. In the period from the school year 1977/78 until today, the number of primary school children was the greatest at the beginning of the school year of 1986/87 (522 413 students). On the other hand, the number of children was the smallest in the school year of 2012/2013 (338 191, which represents 64.74 per cent of the number of students in the school year of 1986/87). On the basis of demographic projections, the number of students in the school year of 2017/18 will be between 328 000 and 332 000. Such information is important for the proposal to introduce changes in the structure of the education system since it indicates that the inclusion of a new generation of students in this school year (9 generations) would correspond to the total number of students in the school year of 2008/09 (8 generations).

The negative trend in the number of students is opposite to the trend in the number of employed teachers, which has been slightly increasing over the last 20 years. In the same period, the number of primary schools and classes has not changed. All these indicators demonstrate that the proposed changes are feasible.

Changing the structure of the education system is a long process that will last for more than a decade, with the full dedication of all stakeholders. The change also requires various interim solutions that will demand the understanding and patience of all those included in the educational process. The education system in Croatia has not yet had the opportunity to face a challenge such as this one. Despite being profound in terms of organisation and funding, the proposed changes are essential due to the positive impacts as demonstrated above.

With the aim of meeting this strategic objective, a broad political, professional and public consensus must be reached. Following this, it will be necessary to plan and draft a model for the proposed changes and analyse the needs of individual education institutions and of self-government units regarding infrastructural, material and staff preconditions of these proposed changes. Other measures will include the provision of infrastructural and material conditions and the redistribution and additional employment of teachers and other educational staff. The prerequisite for the experimental introduction of the structural changes will be the preparation of curricular documents.

- **MEASURE 3.1.** Draft a model for changing the structure of the education system
COMPETENT BODY: Government of the Republic of Croatia, MSES
IMPLEMENTATION: Expert group for drafting the model for changing the structure of the education system
INDICATORS: Model developed for changing the structure of the education system. Public debate held. Adoption of the model for changing the structure of the education system.
- **MEASURE 3.2.** Analyse the needs of individual education institutions and self-government units regarding infrastructural, material and human resources
COMPETENT BODY: MSES
IMPLEMENTATION: MSES, universities, public research institutes
INDICATORS: Needs for infrastructural, material and human resources identified
- **MEASURE 3.3.** Provide infrastructural and material conditions and conditions for the redistribution and/or additional employment of teachers and other educational staff
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: Government of the Republic of Croatia
INDICATORS: Infrastructural, material and human resources provided.

OBJECTIVE 4: IMPROVE THE QUALITY OF TEACHING AND ENHANCE THE STATUS OF THE TEACHING PROFESSION³³

Rapid social and technological changes in the contemporary world create considerable challenges for education systems and the teaching profession, which require profound changes in their approach to teaching and learning. In order for schools to be able to appropriately respond to new and complex social circumstances, contemporary teachers must considerably broaden their set of professional competences. They must also be able to critically reflect on their teaching practices based on the





achievement of their students, and to adapt their teaching practices to students' needs.³⁴ Good teachers are those that create an encouraging learning setting, that recognise and take students' needs and interests into consideration, and that adapt teaching to students' individual capabilities. Furthermore, teachers use their competences to encourage every child to reach a high level of educational achievement as a basis for accomplishing their human and professional potential.

Strengthening the capacity of the teaching profession in terms of attracting and retaining the best individuals in the education system — as well as systematically fostering the development of teaching potential — have become major issues in all societies that recognise quality education as a key factor in social development.

The most recent comparative data on the teacher/student ratio in Croatia indicate that the situation is relatively favourable compared to other European countries. In Croatia, the teacher/student ratio for primary schools is 1:14, which is within the European average. However, the ratio for secondary education is 1:11, which is better than the European average.³⁵ Moreover, there has been a slight increase in the number of teachers at all levels, whereas the number of students has been in decline in Croatia over the past decade.³⁶ It should also be mentioned that Croatia is one of the few countries in Europe that does not systematically monitor the needs of the labour market in this area (Eurydice, 2013).

According to analyses of registered higher education applicants (who are in the process of selection and enrolment in study programmes), a relatively high interest is expressed by them for teacher and education studies, especially for studies at teacher faculties. One of the likely reasons for this interest is that — despite the fact that teachers have considerably lower average salaries compared to employees with academic qualifications working in the public sector or in other areas of the economy (Statistical Yearbook of the Republic of Croatia, 2012) — the teaching profession is perceived as a relatively stable profession in a period of economic crisis. The interest for teacher studies has probably also been triggered by the transformation of the teacher education study programme into a university study programme with the possibility of progressing up to the doctoral level and obtaining a Doctor of Philosophy degree.

However, when it comes to attracting the best candidates into teacher training study programmes, the analyses of enrolment data show that candidates for teacher and pedagogical studies do not have the highest achievements in secondary education and State Matura examinations. The issue concerning the real career intentions of these candidates regarding employment in the education sector also remains open, especially taking into account the salary that may be earned in the profession. According to data from the Statistical Yearbook (2012), the average net salary of employees who have acquired academic qualifications in the

education sector amounts to 6 321 HRK, which is the lowest average salary of employees who have obtained academic qualifications in Croatia. Analyses show that the most economically developed countries that also achieve the best results in international comparative assessments of educational achievements (e.g. PISA) invest more in teachers, and manage to attract and retain them in the profession by means of high salaries and good working conditions. It should be noted, however, that these assessments also show that increasing investment in education does not necessarily result in better quality of teachers' work or a higher social status of teachers, but that other measures for the professionalisation of the teaching profession need to be introduced at the same time.^{37,38}

Regarding the possibility of attracting and retaining the best individuals in the profession, one of the identified problems is the relatively high proportion of inadequately qualified teachers in certain Croatian regions, whereas the qualifications of teachers in other regions is quite satisfactory. Another problem is the fact that the highest proportion of inadequately qualified teachers work in poorly developed regions whose population generally has a lower education level, which additionally reduces the chances for quality education of children in these regions. Moreover, there is a shortage of qualified teachers in the following subject groups: mathematics, information and communication technologies (ICT), natural sciences and foreign languages. However, it should be noted that the current teacher shortage in the field of natural science, mathematics and ICT in Croatia generally reflects the situation in most European countries. This situation is also reflected in the lower results achieved by students in national knowledge-assessment examinations in those fields.³⁹

The results achieved by our students in external evaluation of learning outcomes and in international comparative assessments may also be used as an indirect measure of the quality of educational work in schools (e.g. OECD, 2010⁴⁰). Lower achievements of our students in tasks that are used for the testing of higher levels of knowledge (such as the application of knowledge, knowledge linking, conceptual understanding and deduction) indicate that special attention must be paid to the enhancement of the quality of educational work at all levels of pre-tertiary education. This can be achieved through the systematic enhancement of initial and continuing education of teachers and in-service teacher training. It can also be achieved by ensuring better working conditions and ensuring the full professionalisation of the teaching profession. This could ensure the retention of the best individuals in the profession, who are ready to participate in lifelong learning and professional development.

Over the past decade, significant changes have occurred both in Croatia and Europe in the area of initial teacher education. These changes have been largely conditioned by the implementation of the Bologna Process in higher education, with the main trend in Europe being the 'universitisation' of initial teacher education. Obtaining a Master of





Arts (MA) qualification has now become a precondition for entering the teaching profession in primary and secondary schools in Croatia. This change has had a particularly important consequence for teacher studies, since it now enables access to third cycle or doctoral study programmes for teachers. This in turn has strengthened the scientific orientation of these study programmes. Nevertheless, the duality between initial education for primary school teachers and for secondary school teachers still persists for the most part in this area. In Croatia, a concurrent model of initial education of teachers in pre-school education institutions and primary schools has been applied. Pedagogical studies have undergone transformation from three-year professional studies into undergraduate university studies. Upon their completion, it is possible to continue initial education at a graduate university study programme of early childhood and pre-school education. Regarding primary school teachers, a five-year integrated study programme is now in place. Regarding the training of subject- and secondary-school teachers, a successive model is applied according to which teacher competences are acquired at the graduate level. A special challenge, however, is the education of secondary school teachers who teach vocational subjects and who acquire their teacher competences in certificate programmes based on a lifelong education model combined with work-based learning. The quality of such teachers' training is generally considered to be inappropriate in terms of the educational needs of vocational school students. The difference between these models is also reflected in the different perceptions that teachers have of their professional role and identity, as well as the differences in their dominant approaches to teaching and learning in schools.⁴¹

In many relevant sources containing discussions on the right balance between theoretical knowledge of school subjects, educational sciences and school practice (development of practical skills), there is serious concern over the potential reduction of time spent in school practice.⁴² In most European countries (Eurydice 2013), initial teacher education programmes have changed their orientation by focusing more on competence profiles and learning outcomes than on the content of disciplines. These changes have also been accompanied by the introduction of new topics and approaches such as: education for diversity; class/school management and teacher leadership; civic education; incidental- learning and peer-learning methods; and increasing self-regulation in learning. These topics are still not covered adequately or systematically, especially not in initial teacher education at our universities. The main challenge of initial teacher education is the introduction of competence- and learning-outcome-based curricula, combined with the need for changing traditional approaches to teaching and learning. Once again, this raises issues on the role and profile of teacher educators at all levels. On several occasions, both in the European Union and in Croatia,⁴³ concern has been expressed regarding the ability of teacher trainers to use the student-centred approach in teaching at the university level, regarding their ability to supervise educational practice in partnership with

mentors and regarding the ability of professionals in early childhood and pre-school education/teachers employed at education institutions to provide high-quality mentorship.

In Croatia, there is a formally established system of in-service teacher training and teacher development. Such in-service teacher training has a long tradition and is carried out and fostered by the following institutions: the Education and Teacher Training Agency (ETTA); the Agency for Vocational Education and Training and Adult Education (AVETA); the Agency for Mobility and EU Programmes (AMEUP); the National Centre for External Evaluation of Education (NCEE); faculties of teacher education; and non-governmental organisations. In-service teacher training is organised at the institutional, regional (through county expert boards) and national (state expert meetings) levels. All teachers are provided with the opportunity for in-service teacher training of at least 20 hours per year, and a relatively high proportion of teachers participate in such training.⁴⁴ There is a variety of forms and a large number of programmes and topics of in-service teacher training, aimed at different target groups both in the country and abroad. However, these forms, programmes and topics have not been harmonised — they are planned separately and they do not allow for the harmonisation of competences of teachers of different profiles. In-service teacher training organised by competent agencies is free of charge, the information is available to the public and the registration process is easy. Despite this, in most cases such training only takes place on a ‘one-off’ basis, it does not provide sufficient opportunities for experiential/incidental learning and reflection, and its application lacks monitoring and support.

The barriers to the improvement of the quality and effectiveness of teaching are the following: the lack of a long-term strategy for continuing professional development; the lack of alignment between the initial teacher education system, traineeships and the in-service teacher training system; and the inadequate inclusion of universities in providing in-service teacher training programmes. The systematic implementation of needs analyses and long-term planning of professional development at the individual and institutional level is currently hindered by the lack of efficient coordination between agencies responsible for in-service teacher training and by the lack of systematic monitoring and gathering of data on in-service teacher training at the national level. The preconditions for in-service teacher training to make a genuine contribution towards the continuing professional development of teachers and for the improvement of the quality and effectiveness of teaching are the following: improving the quality of the mentorship system during the traineeship period; connecting continuing professional training of teachers with the competence standards; and the teacher licensing system.

While the implementation of the Bologna Process both in Europe and Croatia has contributed to the introduction of general measures for quality assurance in higher education, few countries have specific qual-





ity assurance mechanisms for initial teacher education. In countries that apply regular procedures for the accreditation and evaluation of study programmes, a combination of several procedures is typically used, such as on-site visits, curricula analyses, self-evaluation reports or other basic documents. Within the system of continuing professional development, on the other hand, quality assurance mechanisms are much more diverse and in some cases they do not even exist. The report entitled 'Quality Assurance in Teacher Education in Europe'⁴⁵ reveals that, at the time the analysis was being conducted, 50 per cent of European countries did not have strict regulations, and one third of the countries analysed did not apply specific quality assurance procedures for continuing professional development programmes — and the latter is currently the case in Croatia.

On the basis of insights into global and especially European trends and recommendations in the area of education and professional development of teachers at all levels (from the pre- school to the secondary level), as well as on the basis of insight into the dynamics of the Croatian education system and teacher support over the last decade, the improving of the quality of teaching work and enhancing the status the teaching profession has been set as the main strategic objective.

4.1. PROFESSIONALISATION OF THE TEACHING PROFESSION

Understanding and treating the teaching occupation as a profession has far-reaching consequences for the regulation and realisation of the specific part of education policy that is related to the knowledge, skills, values, authority, status, ethics, control and the practical part of the teaching occupation. The professionalisation of the teaching occupation⁴⁶ thereby includes several conditions that form the framework for teaching as a profession:

- awareness of the teaching occupation as having a social value that is important for the promotion of other key social and human values and whose members have a high status in society;
- mastery of a high level of specific knowledge and skills that enable the teacher to act autonomously in complex and problematic situations;
- acquisition of professional competences that require a long period of initial university education and formal introduction into the occupation, typically ending in the acquisition of a first licence;
- lifelong development of competences through formal continuing professional development, non-formal independent learning and the periodic assessment of acquired competences (re-licensing);
- initial formal education programmes with harmonised theoretical and practical components, which, along with the acquisition of professional knowledge and skills, also enable the acquisition of professional values and norms, as well as building the teacher's professional identity;

- existence of professional associations whose codes of ethics and other acts define professional values, regulate criteria for entering the profession and professional practice, provide ways to reward excellence, as well as ways to penalise non- professional behaviour.

When comparing the current state of the teaching profession in Croatia with the aforementioned features, it can be concluded that these conditions have only partially been met. Education programmes of faculties of teacher education have indeed been upgraded to university level programmes and procedures do exist for introduction into the profession and for passing professional examinations. However, these systems and procedures have not been established on the basis of clearly defined, formally introduced and verifiable competence standards. The other features are also inadequately developed, in particular the need for a system of quality assurance that would conduct periodic assessments of acquired competences, or the need for independent regulation of the profession on the basis of the work of professional associations. Attracting and retaining the best individuals in the teaching profession would contribute to the general raising of the quality of the teaching and learning process in education institutions of all levels and profiles, which would also have a feedback effect on increasing of status of the teaching profession in society.

An important precondition for attracting and retaining the best individuals in the profession is the systematic improvement of the general material position of teachers and the introduction of targeted measures for fostering and awarding excellence and innovation.

- **MEASURE 4.1.1.** Prepare key documents for the professionalisation of the teaching occupation: a National Competence Standard for the Teaching Profession based on the Croatian Qualifications Framework (CROQF) and a Code of Ethics for Teachers
COMPETENT BODY: National Council for Education, local panels for CROQF IMPLEMENTATION: Expert teams, CROQF
INDICATORS: Preparation of the National Competence Standard for the Teaching Profession and of the Code of Ethics for Teachers
- **MJERA 4.1.2.** Develop a model and introduce a system of (re-)licensing for the acquisition and retaining of the license to work in education institutions
COMPETENT BODY: MSES
IMPLEMENTATION: AZOO/ETTA, ASOO/AVETAЕ and NCVVO/NCEE
INDICATORS: Public debate held on the licensing model. Licensing model approved. Legal act adopted (Ordinance on Licensing). Mechanisms for the implementation of licensing developed. Assessment of level to which the system is operational.
- **MEASURE 4.1.3.** Develop a system of career advancement with the possibility of career flexibility based on the National Compe-





tence Standard for the Teaching Profession

COMPETENT BODY: National Council for Education, MSES

IMPLEMENTATION: Expert team of the National Council for Education

INDICATORS: Model for career advancement criteria developed.

Legal act adopted (Ordinance on Career Advancement of Teachers).

- **MEASURE 4.1.4.** Improve the income level of teachers
COMPETENT BODY: MSES
IMPLEMENTATION: MSES
INDICATORS: Level of teacher salaries is aligned with the average salary of public sector employees who have acquired academic qualifications
- **MEASURE 4.1.5.** Apply high criteria for selecting the best candidates for studying at faculties of teacher education
COMPETENT BODY: Universities
IMPLEMENTATION: Faculties of teacher education
INDICATORS: Quality of candidates enrolling in the study programmes
- **MEASURE 4.1.6.** Stimulate the enrolment of the best candidates in teacher and education study programmes
COMPETENT BODY: MSES
IMPLEMENTATION: MSES, faculties of teacher education
INDICATORS: System established to stimulate students of faculties of teacher education (e.g. scholarships)

4.2. FUNCTIONAL AND STRUCTURAL ENHANCEMENT OF THE INITIAL TEACHER EDUCATION SYSTEM

The analysis of documents and surveys from Europe and the rest of the world shows that the enhancement of initial teacher education is one of the main European and global strategic objectives in education.

Initial teacher education focuses on teaching how to teach and on acquiring broader teacher competences that are defined in European/international recommendations and national competence standards (Eurydice, 2013). These standards serve as an orientation in the creation of both initial teacher education programmes and postgraduate teacher education programmes, whereby the focus of curriculum development shifts from the content of disciplines to competence profiles and learning outcomes.

The introduction of competence-based curricula, combined with the need to change the traditional approaches to teaching and learning, is yet another challenge for the area of initial teacher education regarding the role and profile of teacher educators at all levels. In other words, competence profiles for teacher educators are being analysed in Europe (both

for teachers at universities and mentors in education institutions) and programmes are being developed for upgrading the competences required for educating future teachers. The process of creating university-based teacher education with a European dimension leads to the following results: the harmonisation of curricula in initial teacher education; the alignment of the status of institutions for the education of all categories of teachers; the creation of networks of education experts for developing teacher education strategies; the launching of international research projects in the area of initial teacher education; and the greater mobility of students and professors at respective higher education institutions.

Initial teacher education in Croatia does not fully follow such trends, neither in terms of the rapidity of changes (especially in the development and implementation of competence-based curricula) nor in terms of the adequacy of the changes made. The further enhancement of initial teacher education therefore requires its harmonisation with global and European development trends.

By meeting this objective, core professional competences of teachers will be harmonised and the quality of the level of education of all categories of future teachers will be improved. This will directly affect the improvement of the quality of teaching in education institutions.

- **MEASURE 4.2.1.** Re-define both initial teacher education programmes and postgraduate teacher education programmes based on the National Competence Standard for the Teaching Profession
COMPETENT BODY: University units responsible for initial teacher education, National Council for Education
IMPLEMENTATION: University and faculty bodies responsible for programme development
INDICATORS: Overview provided of the state of play (thematic evaluation of institutions and programmes in the area of education of all categories of teachers). Number of adopted new programmes based on the national competence standard.
- **MEASURE 4.2.2.** Develop new institutional units for the acquisition of teacher competences at the university level for the profiles of teachers who completed non-teaching study programmes (education centres for subject teachers of primary and secondary schools)
COMPETENT BODY: University management boards
IMPLEMENTATION: University management bodies in coordination with faculties of teacher education
INDICATORS: Number of new teacher education centres. Percentage of teachers trained in the new centres. Level of satisfaction of beneficiaries and participants.
- **MEASURE 4.2.3.** Develop programmes for the acquisition of teacher competences for all categories of teachers in secondary vocational education





COMPETENT BODY: Faculties of teacher education, ASOO/AVETAE
IMPLEMENTATION: Teacher education centres at universities, employees of agencies, schools
INDICATORS: Number of adopted programmes for the acquisition of teacher competences for all categories of vocational teachers

- **MEASURE 4.2.4.** Develop programmes for the training and support of teacher educators
COMPETENT BODY: University units responsible for initial teacher education, AZOO/ETTA, ASOO/AVETAE
IMPLEMENTATION: Teacher education centres at universities and employees of agencies and schools
- **MEASURE 4.2.5.** Join international research projects and encourage mobility in the area of initial teacher education
COMPETENT BODY: Faculties of teacher education, ASOO/AVETAE
IMPLEMENTATION: Teacher education centres at universities, employees of agencies and schools
INDICATORS: Number of research projects. Number of students and university staff participating in exchange programmes.

4.3. CONNECTING AND ENHANCING THE TRAINEESHIP SYSTEM AND THE SYSTEM OF CONTINUING PROFESSIONAL DEVELOPMENT OF TEACHERS

The fulfilment of this objective presumes a change of paradigm, moving from in-service teacher training (as only one of the elements of professional development) towards continuing professional development of teachers. Such a paradigm change implies deepening teachers' understanding of the teaching and learning process and using this understanding to improve both the quality of teaching and the educational achievements of their students. There is currently no long-term strategy for the professional development of teachers, which would harmonise and connect the initial teacher education system with the traineeship and continuing professional training of teachers. The lack of such a strategy hinders the quality of work and cooperation between the stakeholders responsible for continuing professional training of teachers. The non-alignment (or lack) of regulations — as well as the insufficiently clear legal provisions regulating this area — are obstacles to the clear understanding of individual and institutional responsibility.

Teacher traineeships are crucial for ensuring the successful connection of theory and educational practice, the retention of young teachers in the profession and their 'professional dedication to their work in the future' (EC, 2012). Trainees of all profiles in general education and vocational education and training need systematic and adequate personal and professional support within the education institution. Such support should be adapted to their specific needs, which requires the careful selection

and good preparation of mentors.

A systematic analysis should be carried out of teachers' needs for in-service teacher training. Additionally, the effects that in-service teacher training has on the quality of teachers' direct educational work should be monitored. Such measures would allow the identification of priority areas requiring special attention. Participation in in-service teacher training should be based on a professional development plan (at the individual level and at the level of the education institution) and should be harmonised with recognised needs and with the efficient use of available resources.

The new values that should be acquired by teachers through an effective continuing professional development system should be the following: being proactive and taking responsibility for personal and professional development in the area of teacher competences and general competences; taking an active role in organising adequate conditions for students' learning; defining learning outcomes and producing the curriculum (or some of its parts); and motivating and encouraging students to achieve the best possible results with respect to their own capabilities.

Regardless of the support provided by the European Union through the Erasmus+ programme, participation in these programmes is very low in Croatia. There is also a weak connection of vocational education and training with labour market needs.⁴⁷ Vocational teachers' experience gained in the world of work has not been sufficiently exploited and there is a lack of synergy regarding the impact by teachers of different profiles on the fulfilment of set strategic objectives at the institutional level.

The fulfilment of this objective will greatly contribute to the quality, efficiency and expediency of continuing professional development. The expected result is that teachers will understand professional development as a process that is based on reflection upon their own educational practice and based on the genuine recognition of the need for improvement. Furthermore, this process is active, cooperation-oriented, harmonised with the education institutions' development plans and focused on the quality of direct work with children/students.

- **MEASURE 4.3.1.** Establish an effective system of support, monitoring and mentorship during teacher traineeships
COMPETENT BODY: MSES, AZOO/ETTA, ASOO/AVETAЕ, NCVVO/NCEE, faculties implementing initial teacher education programmes
IMPLEMENTATION: Panel responsible for the preparation of a model for an effective system for mentoring trainees (representatives of AZOO/ETTA, ASOO/AVETAЕ and faculties implementing initial teacher education programmes)
INDICATORS: Model developed for the system for mentoring trainees. Assessment of the extent to which the system is operational. Number of training programmes for mentors. Level of satisfaction of participants.





- **MEASURE 4.3.2.** Establish a model for continuing professional development based on the National Competence Standard for the Teaching Profession, on defined priority areas at the system level and on stakeholders' needs
COMPETENT BODY: MSES, AZOO/ETTA, ASOO/AVETAE, NCVVO/NCEE, faculties implementing initial teacher education programmes, professional associations, scientific institutions in the education area
IMPLEMENTATION: Working groups for the preparation of a long-term national strategy for continuing professional development aligned with the National Competence Standard for the Teaching Profession: of MSES; AZOO/ETTA; ASOO/AVETAE; NCVVO/NCEE; and faculties implementing initial teacher education programmes. Research teams for monitoring the effects of in-service teacher training on the quality of direct educational work of teachers: research institutes; faculties of teacher education; AZOO/ETTA; ASOO/AVETAE; NCVVO/NCEE.
INDICATORS: Degree of implementation of the system for monitoring participation in in-service teacher training, as well as individual and institutional needs for professional training. Results of an annual analysis of the needs for professional training. National strategy for continuing professional development aligned with the national teacher competence standard.
- **MEASURE 4.3.3.** Establish a model for the implementation and monitoring of professional development of individuals at the system level and the level of the education institution
COMPETENT BODY: National Council for Education, AZOO/ETTA, ASOO/AVETAE
IMPLEMENTATION: Expert panels and teams for the quality of education institutions; AZOO/ETTA and ASOO/AVETAE advisers; schools
INDICATORS: Developed and approved mechanisms and instruments for monitoring the quality of professional training programmes. Percentage of education institutions with developed plans for continuing professional training.
- **MEASURE 4.3.4** Encourage international cooperation and mobility in the area of continuing professional development of teachers
COMPETENT BODY: MSES, AZOO/ETTA, ASOO/AVETAE, NCVVO/NCEE, AMPEU/AMEUP
IMPLEMENTATION: AMPEU/AMEUP, education institutions' expert boards
INDICATORS: Percentage of institutions and number of individuals participating in international programmes and projects.

4.4. ESTABLISHMENT OF A COMPREHENSIVE SYSTEM OF QUALITY ASSURANCE OF INITIAL TEACHER EDUCATION AND CONTINUING PROFESSIONAL DEVELOPMENT

The quality of teachers is the most important school factor contributing to the educational success of students.⁴⁸ Schools can provide high-quality education if measures are systematically introduced for attracting the best candidates to the teaching profession and if these candidates are provided with conditions that encourage further training and development, and that reward excellence.⁴⁹ Contemporary education systems therefore pay special attention to quality assurance in the area of initial education and lifelong professional development of teachers.⁵⁰

European reference documents contain clear guidelines for quality assurance in initial teacher education and subsequent professional development of teachers (EC, 2012). European education policy places emphasis on initial teacher education that is based on clear competence standards and that, besides a focus on standard knowledge of a given subject and of subject-teaching methods, also focuses on the development of future teachers' capacities for self-reflection and for examining their own teaching practice. The application of competence standards in initial education must strengthen both the motivation of future teachers and their dedication to their own professional development throughout their career. Teachers' professional development should place an emphasis on the development of research competences, reflective practice, strengthening the capacity for introducing innovations and supporting the development of leader capacities as the key competence for all teachers.

The initial analysis of the situation in Croatia has recognised the need for introducing a comprehensive system of quality assurance in the professional development of teachers. This would result in connecting initial teacher education, traineeship of teachers and in-service teacher training into a coherent unit. Such a system would allow for the sustainable and continuous enhancement of teachers' professional capacities as part of a broader quality assurance system in Croatian education.

As an important component of the whole system of quality management in education, the quality assurance system in the area of professional development of teachers will contribute to the enhancement of the educational process and its outcomes. In addition, the recognition and rewarding of excellence will contribute to raising the status of the teaching profession.

- **MEASURE 4.4.1.** Introduce a harmonised system of external and internal quality assurance in initial teacher education and in the system of continuing professional development of teachers
COMPETENT BODY: MSSES, NCVVO/NCEE, AZVO/ASHE, National Council for Education
IMPLEMENTATION: NCVVO/NCEE, AZVO/ASHE, ASOO/AVETAET,





AZOO/ETTA, school teams for quality

INDICATORS: Mechanisms established for quality assurance of initial and lifelong teacher education programmes with stakeholders' authority and responsibilities being clearly distributed

- **MEASURE 4.4.2.** Introduce a system for recognising and rewarding excellence of teacher education students and employed teachers

COMPETENT BODY: Faculties of teacher education, AZOO/ETTA, ASOO/AVETAE

IMPLEMENTATION: National Council for Education, faculties of teacher education

INDICATORS: Clear criteria and procedures established for the evaluation of the quality of outstanding individuals, in accordance with the competence framework for teachers. Assessment of the extent to which the system is operational.

- **MEASURE 4.4.3.** Encourage the development of teacher capacities in the area of self- reflection, strategic planning and leadership for the introduction of improvement and innovation into the teaching practice

COMPETENT BODY: Faculties of teacher education, AZOO/ETTA, ASOO/AVETAE

IMPLEMENTATION: Coordination body at the level of all universities implementing initial teacher education programmes

INDICATORS: Number of courses/modules in initial education and programmes for continuing professional development of teachers that develop self-reflection, leadership and strategic thinking. Level of teacher capacities in the area of self-reflection, strategic planning and leadership. Number of examples of improvement and innovation in the teaching practice.

- **MEASURE 4.4.4.** Strengthen institutional and individual capacities for conducting research in the area of education and professional development of teachers for the purpose of creating and enhancing education policies and educational practice

COMPETENT BODY: National Council for Education, Academy of Educational Sciences, scientific organisations in the education area

IMPLEMENTATION: Education experts in science and higher education

INDICATORS: Number of projects in the area of educational sciences. Number of publications in the area of educational sciences. Number of education policies created based on research results.

OBJECTIVE 5: IMPROVE THE QUALITY OF MANAGEMENT IN EDUCATION INSTITUTIONS

Along with the role of teachers, the role of school principals most strongly determines the quality of the functioning of schools and other education institutions. It is therefore essential to pay special attention to the area of professionalisation of the role of school principals in order to achieve the maximum potential of education institutions and the education system in general.⁵¹

Contemporary approaches to examining the role of education institution management strongly highlight the importance of pedagogical management, i.e. management focused on the enhancement of the central and most important of school processes — teaching and learning.⁵²

This vision is closely related to the understanding of education institutions as learning communities. However, even within this paradigm, what remains important is the role that school principals play when it comes to constructing procedures and mechanisms that strengthen the organisational/administrative management of the school and its work. The wide range of tasks and responsibilities of school principals, as well as high expectations, render the position of school principals extremely demanding.

The usual tasks and work that should be carried out by the managers of education institutions (school principals) are: taking care of the quality of teaching and working with students; development planning; professional development of employees; and provision of the functioning of the institution on a daily basis. Research and school practice has shown that successful school principals:⁵³

- have a clear vision of development, and give direction to the school's development;
- build mutual trust among teachers;
- provide conditions for quality teaching and learning;
- enrich the school curriculum;
- strengthen the role of teachers and encourage their professional development;
- foster excellence in teaching;
- build cooperative relationships among teachers and encourage exchange of good practice;
- build cooperation between the school and stakeholders outside the school community.

At the same time, it has become clear that the success of school management always depends on the specific context in which the school operates, the students' socioeconomic backgrounds and the level of parental involvement.





The undisputable importance of management for the fulfilment of educational outcomes has encouraged all developed countries to launch activities to contribute to the quality assurance of the work of school principals.

In line with the global trends in the theory and practice of school management, the interest of the education profession for the role of school principal has increased in Croatia for the last 20 years. This is particularly apparent in improved legislation, more expedient activities of associations, richer literature production and better conceptualisation of relevant documents. However, there has been a lack of concrete activities that provide support for education policy. We are thus one of the few European countries that still entrusts the management of education institutions to untrained school principals.

School principals are currently not trained for the purpose of assuming the function of manager. There is also no adequate system for attracting individuals who are interested in the position of school principal, which would allow a selection of higher-quality candidates. Obtaining a license is not prescribed by law in pre-school institutions and although it is prescribed for primary and secondary schools (as well as student dormitories), the manner of obtaining it has not been regulated yet. There are no suitable criteria for determining the pedagogical and management competences of candidates. None of the important elements related to assuming of the position of school principal, to the performance of his/her duties and to leaving office has been appropriately regulated, which results in school principals not being prepared for the management of education institutions.

This results in the need for changes that are in the interest of school principals and education institutions, and especially of the educational achievements of children and students. These changes can be introduced if the management of education institutions is looked upon as a profession with clearly defined competence standards.

In order to professionalise the work of school principals, the following must be achieved: candidates need to be prepared for the role of school principal; school principals must be supported to optimally perform their duties; the status of school principals must be strengthened; the qualities of school principals need to be taken into account after they have left office; and continuous support must be provided for the development of the profession.

5.1. RE-DEFINING THE ROLE OF SCHOOL PRINCIPALS

The role of school principals in pre-tertiary education institutions has not been adequately defined. The obligations and responsibilities of school principals must be defined based on good practice examples and to the future changes that are expected in education. This especially refers to

responsibilities related to: the quality of education; teaching and learning; the ability to define a vision; monitoring and evaluation of the educational process; student achievements; human potential management; and cooperation with other institutions. Re-defining the role of school principals will result in: a clearer understanding of their obligations and responsibilities; a more efficient distribution of work among educational staff; the preparation of competence standards; the launching of suitable training programmes for future school principals; the defining of quality indicators; the preparation of licensing programmes; and a greater autonomy of school principals.

- **MEASURE 5.1.1.** Define the role of school principals. Prepare documents regulating the role of school principals in all parts of the system (kindergartens, primary schools, secondary schools, student dormitories).

COMPETENT BODY: MSES, AZOO/ETTA

IMPLEMENTATION: Expert team in the area of managing/running education institutions

INDICATORS: Documents prepared and adopted

5.2. PREPARING COMPETENCE STANDARDS FOR SCHOOL PRINCIPALS

Competence standards define the compulsory knowledge, skills and values of future school principals. They provide the basis for school principals' education, training, licensing, (re)election, introduction into the position, professional development and evaluation. The defining of the scope and limits of the area covered by the standards reduces the possibility of irregularities in the election procedure for school principals, thereby contributing to the professionalisation of the role of school principals.

- **MEASURE 5.2.1.** Prepare competence standards for school principals

COMPETENT BODY: MSES, National Council for Education

IMPLEMENTATION: Expert team in the area of managing/running education institutions

INDICATORS: Standards prepared and adopted. Level of quality of defined standards (relevance, clarity, objectivity, measurability).

Level of harmonisation with the defined role of school principals and the strategy/vision for the development of the Croatian education system.





5.3. INSTITUTIONALISATION OF THE EDUCATION OF FUTURE SCHOOL PRINCIPALS

The education and training of candidates for the role of school principal must be institutionalised within the framework of specialised institutions. The whole subject matter of the education and training of future school principals must be regulated by law and implementing acts.

- **MEASURE 5.3.1.** Create the legal preconditions for the institutional education and training of school principals
COMPETENT BODY: MSES
IMPLEMENTATION: Expert team in the area of managing/running education institutions
INDICATORS: Legal acts adopted
- **MEASURE 5.3.2.** Accredite institutions that would implement specialist education
COMPETENT BODY: AZVO/ASHE
IMPLEMENTATION: AZVO/ASHE
INDICATORS: Number of accredited institutions. Level of quality of the accreditation process.
- **MJERA 5.3.3.** Adopt a syllabus for the education and training of school principals
COMPETENT BODY: MSES, AZVO/ASHE
IMPLEMENTATION: Relevant higher education institutions
INDICATORS: Specialist programmes adopted

5.4. PREPARATION OF A LICENSING PROGRAMME AND PROCEDURE

The development of a school principal licence will provide evidence of being qualified to assume the position of school principal, based on an objective validation of the level of training according to competence standards. The first (basic) licence would be obtained prior to assuming the position. The obligation of licensing could be determined during the performance of the school principal's duties. The licence should be looked upon in the context of the professionalisation of the position of school principal. By conducting periodic licensing and by possible revocation of the licence, the responsibility of the role of school principal would be strongly highlighted. The licensing programme and procedure, the issuing and renewal of the licence must be well-devised and regulated by appropriate legal provisions.

- **MEASURE 5.4.1.** Develop a system for evaluating the work of the school principal and adopt criteria and instruments for the implementation of the evaluation.

COMPETENT BODY: MSES

IMPLEMENTATION: AZOO/ETTA, National Council for Education

INDICATORS: Criteria and procedures established for the evaluation of the work of school principals. Level of alignment with the competence framework for school principals; instruments prepared. Assessment of the extent to which the system is operational.

- **MEASURE 5.4.2.** Prepare the Ordinance on the Licensing Programme and Procedure

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, National Council for Education

INDICATORS: The licensing model adopted, legal acts adopted (Ordinance on Licensing) and mechanisms for the implementation of licensing developed

- **MEASURE 5.4.3.** Launch a system of (re-)licensing for the acquisition and retaining of the license to work in education institutions

COMPETENT BODY: MSES IMPLEMENTATION: NCVVO/NCEE

INDICATORS: Assessment of the extent to which the system is operational. Percentage of school principals with issued licences.

OBJECTIVE 6: DEVELOP A COMPREHENSIVE STUDENT SUPPORT SYSTEM

One of the most effective forms of enhancing the quality of education systems is student-oriented intervention at the school level. Such intervention establishes mechanisms for identifying learning difficulties and for providing additional support to students in order to enhance their achievements. For this reason, both successful education systems and successful schools (at the micro-level) pay special attention to providing support to individual students⁵⁴ not only to students with difficulties and gifted students, but to everyone.

In the Croatian education system, several forms of student support are currently provided, focusing on the improvement of their educational achievements, the development of their personal potential and their overall well-being. However, these forms are not systematic. Therefore, the main objective within this area is the provision of a comprehensive system of support for children and students, which brings together various support mechanisms within education institutions and beyond. Such mechanisms include learning support, psychological support and career counselling, as well as specific support for children/students with difficulties and gifted children/students.





6.1. ESTABLISHING STANDARDISED MECHANISMS FOR EARLY IDENTIFICATION OF DEVELOPMENTAL NEEDS AND POSSIBLE DIFFICULTIES OF CHILDREN

An education system based on equal educational opportunities must include a support system for children focused on the fulfilment of every child's specific needs. It is therefore essential to systematically implement early identification of children's developmental needs and possible difficulties. Early identification of developmental risks (including risks in a child's social environment) is of crucial importance for timely and effective early intervention, problem prevention and mental health enhancement, as well as for creating the conditions for the high-quality education of every child. All pre-school children must be included in the system of early identification, regardless of whether they are included in early childhood and pre-school education programmes. In order to fulfil this objective, it is necessary to ensure the following:

- compulsory implementation of procedures for early identification of possible difficulties with children between three and five years of age by applying the appropriate standardised procedure and diagnostic instruments (in early childhood and pre-school education institutions);
 - compulsory implementation of identification of possible difficulties of children during the process of determining the psychophysical maturity of children for school by applying the appropriate standardised procedure and diagnostic instruments (in primary schools).
- **MEASURE 6.1.1.** Provide staff (psychologists, educational rehabilitation professionals, speech and language pathologists, and mobile expert teams) with financial and spatial conditions in kindergartens and primary schools for the implementation of standardised procedures for early identification of children's difficulties
COMPETENT BODY: MSES, founders of early childhood and pre-school education institutions, founders of primary schools
IMPLEMENTATION: School principals, school support staff and expert members of mobile expert teams
INDICATORS: Number of pre-school and primary education institutions implementing the early identification procedure
 - **MEASURE 6.1.2.** Change the procedure for determining children's readiness to attend primary school (Ordinance on the Enrolment of Children in Primary Schools) by regulating the composition of the expert panel for determining children's readiness to attend primary school, so that the expert panel is composed of psychologists, educational rehabilitation professionals and speech and language pathologists who have been trained for the application of standardised procedures for early identification of children's special educational needs.
COMPETENT BODY: MSES IMPLEMENTATION: MSES

INDICATORS: Amendment of the Ordinance on the Enrolment of Children in Primary schools.

6.2. ESTABLISHMENT OF A COMPREHENSIVE SUPPORT SYSTEM FOR CHILDREN AND STUDENTS IN EDUCATION INSTITUTIONS

MECHANISMS FOR EARLY INTERVENTION, MONITORING, COUNSELLING AND OTHER FORMS OF SUPPORT FOR CHILDREN AND PARENTS IN KINDERGARTENS

The early childhood and pre-school period is an extremely important period in the development of an individual and is therefore subject to special social care and protection. In the early childhood and pre-school period, the foundations are laid both for the comprehensive future development of an individual and for the quality of their education. Systematic support to children with difficulties and their parents is of particular importance, as well as to children from socially vulnerable groups and their parents. With a view to ensuring systematic support to children and parents in kindergartens and meeting their specific needs, it is essential, upon identifying children's developmental needs, to establish timely, expert and continuous support that includes early intervention, the monitoring of a child's psychophysical development and parent counselling. The mechanisms for identification, intervention, counselling and monitoring must be plan-driven and evaluated. In addition, kindergartens must provide specific forms of support to gifted children.

Systematic care for the needs of children and their parents includes all participants in early childhood and pre-school education, as well as other systems responsible for children and their rights (social welfare, health care and the judiciary). Cooperation between all institutions within the education system and inter-sectoral cooperation is therefore especially important. It is also essential to provide assistance and support in a natural and inclusive environment as much as possible. Expert teams in kindergartens need to play a key role in coordinating and implementing all activities since they are in day-to-day direct contact with children and their parents. The assistance and support provided to children includes systematic, timely, expert and interdisciplinary assistance and support to parents, with the aim of raising the quality of parenthood and the quality of life of the child in the family, especially for parents of children with difficulties and those from socially vulnerable groups. In order for the support system to be comprehensive, it is essential to provide support with regard to children's transition to other institutions (from kindergartens to schools) and obligatory cooperation with institutions in which the child is being enrolled.

- **MEASURE 6.2.1.** Establish mechanisms for early intervention, monitoring psychophysical development, parent counselling and support to gifted children in kindergartens

COMPETENT BODY: Kindergartens IMPLEMENTATION: Expert



teams in kindergartens

INDICATORS: Number of kindergartens with effective mechanisms for early intervention, the monitoring of psychophysical development and parent counselling.



MECHANISMS FOR IDENTIFICATION, COUNSELLING AND MONITORING IN SCHOOLS AND STUDENT DORMITORIES

Students who lack developed methods for effectively coping with difficulties usually achieve significantly poorer results than their abilities would normally allow and they often come into conflict with their environment. Coping with these challenges appropriately is therefore essential both for the success of these students at school and for their personal well-being.

At the end of primary and secondary education, students must make decision about their further education. The selection of secondary and higher education not only largely affects their future academic success, but also the realisation of their life goals. Simultaneously, making the right decision requires the identification of their own interests and motivation, the realistic assessment of their abilities, as well as being well-informed of the possibilities for further education and employment (especially in scarce occupations). Due to this, a great number of children and youth, particularly those who cannot receive help in their own families, need adequate support in the form of organised and well-structured career counselling in order to make the right decision.

In order for schools and student dormitories to be able to provide these kinds of support to students, it is necessary to establish a mechanism for identification, monitoring and counselling of students and their parents, which includes the following:

- individual counselling of students by a psychologist (at the school or student dormitory) developing metacognitive, social and emotional skills and professional guidance (career counselling), as well as parent counselling;
- monitoring, individual counselling and professional informing of students and their parents by the homeroom teacher with regard to school success and other aspects of life at school;
- individual counselling of students and their parents by teachers with regard to the learning of different subjects.

- **MEASURE 6.2.2.** Organise a system of individual counselling of students and parents with the school psychologist, homeroom teacher, teachers and other educational staff

COMPETENT BODY: Schools

IMPLEMENTATION: School psychologists, teachers and other educational staff trained

INDICATORS: Number of students who used the possibility of individual counselling. Number of hours of individual counsel-

ling. Number of schools implementing the individual counselling programme.

- **MEASURE 6.2.3.** Include counselling work with students into the number of hours of teachers' direct educational work with students
COMPETENT BODY: MSES IMPLEMENTATION: MSES experts, trade unions
INDICATORS: Adequate solutions in regulations defining the number of hours of teachers' work.

Students with difficulties represent a particularly vulnerable group of children and youth. Empowering them and providing them with equal opportunities requires specific mechanisms in addition to general support mechanisms aimed at all students. Therefore, besides counselling aimed at all students, students with difficulties must also be provided with additional counselling with a social pedagogue, speech and language pathologist and/or educational rehabilitation professional, primarily in order to meet the specific needs related to their difficulties and to provide them with adequate professional guidance. It is necessary to establish and/or systematise additional forms of academic, emotional and social support to students with difficulties, as well as systematise cooperation between all participants in the process of identifying, monitoring and supporting students with difficulties. This implies, on the one hand, strengthening cooperation mechanisms within the school or student dormitory (between teachers, other educational staff, parents and the expert team). On the other hand, this implies strengthening cooperation between schools, student dormitories and other institutions (between primary and secondary schools; between schools and student dormitories; between schools/student dormitories and social welfare centres, health centres, Ministry of Interior, etc.).

- **MEASURE 6.2.4.** Organise a system of additional individual counselling of students with difficulties and their parents with a speech and language pathologist, a social pedagogue and/or an educational rehabilitation professional
COMPETENT BODY: Schools
IMPLEMENTATION: Speech and language pathologists, social pedagogues, educational rehabilitation professionals in schools; mobile expert teams
INDICATORS: Number of students with difficulties who used individual counselling. Number of hours of individual counselling.

- **MJERA 6.2.5.** Provide human, financial and spatial resources for half-day school attendance during which the extended expert procedure is carried out
COMPETENT BODY: MSES, schools, education centres for students with difficulties, school founders
IMPLEMENTATION: School professionals and/or professionals in cooperative institutions





INDICATORS: Number of schools with half-day school attendance during which the extended expert procedure is carried out. Number of students included in half-day school attendance during which the extended expert procedure is carried out.

- **MEASURE 6.2.6.** Establish an equitable and effective system for approving, recruiting, funding, training and licensing education assistants

COMPETENT BODY: MSES, AZOO/ETTA, local and regional self-government units

IMPLEMENTATION: Expert team composed of experts from MSES, AZOO/ETTA, schools, student dormitories and relevant services in local and regional self-government units

INDICATORS: Adoption of an ordinance that regulates all relevant aspects of the work of education assistants. Number of recruited, trained and licensed education assistants.

- **MEASURE 6.2.7.** Launch peer support groups and incorporate these into the school (student dormitory) curriculum

COMPETENT BODY: Schools, student dormitories

IMPLEMENTATION: Professionals in schools and student dormitories, teachers, other educational staff

INDICATORS: Number of schools that have incorporated peer support groups for students with difficulties in their school curricula. Number of students involved in the work of peer support groups.

LEARNING SUPPORT MECHANISMS IN SCHOOLS AND STUDENT DORMITORIES

The Act on Education in Primary and Secondary Schools ('Official Gazette', No 87/08, 86/09, 92/10, 105/10, 90/11, 5/12, 16/12, 86/12 and 94/13) explicitly obliges schools to organise remedial instruction for students who need assistance in learning, as well as additional instruction for students who show special interest in a certain subject or educational content. However, only a small number of schools (mainly secondary schools) implement remedial and additional instruction in a systematic manner and in accordance with students' real needs. It should therefore be ensured that all schools systematically and continually organise the following: a) remedial instruction for students who need assistance in solving occasional or continual problems in mastering the subject matter, in accordance with students' real needs; b) additional instruction and extra-curricular activities for students who show interest in certain subjects, topics or activities, in accordance with students' real needs; c) support to students in acquiring metacognitive (learning how to learn), social and emotional skills.

- **MEASURE 6.2.8.** Include remedial instruction, additional instruction and extra-curricular activities into the number of hours of teachers' direct educational work with students

COMPETENT BODY: MSES IMPLEMENTATION: MSES experts, trade unions

INDICATORS: Adequate solutions in regulations defining the number of hours of teachers' work

MJERA 6.2.9. Ensure regular implementation of remedial instruction, additional instruction and extra-curricular activities in accordance with students' real needs

COMPETENT BODY: Schools

IMPLEMENTATION: School principals, teachers, other educational staff

INDICATORS: Percentage of schools regularly implementing remedial instruction, additional instruction and extra-curricular activities in accordance with students' real needs. Number and percentage of students included in additional instruction, remedial instruction and extra-curricular activities. Number of lessons held related to remedial instruction, additional instruction and extra-curricular activities.

MJERA 6.2.10. Create programmes for developing metacognitive, emotional and social skills and incorporate them into the school curriculum

COMPETENT BODY: Schools

IMPLEMENTATION: School principals, teachers, other educational staff

INDICATORS: Elements regarding the development of metacognitive, emotional and social skills are incorporated into curricula of all schools. Number of schools that have prepared programmes for developing metacognitive, emotional and social skills and incorporated them in the school curricula.

In order to facilitate the development of the potential of students with difficulties, it is necessary to establish a systematic form of high-quality additional support in schools and student dormitories. Such support includes individualised teaching and learning, learning through an adapted programme and learning through a special programme.

The main obstacle to the full integration/inclusion of children and students with difficulties is prejudice, which still exists equally among children, students, teachers, school principals and other educational staff, as well as among parents of children and students without developmental difficulties. Moreover, education institutions are still not adequately adapted to children and students with difficulties in terms of facilities, and only a few of them have the necessary specific equipment.

It is therefore necessary to transform kindergartens, schools and student





dormitories into a friendly environment for children and students with difficulties, in which they will feel equally valuable and which will continually strive to remove obstacles to their full integration.

- **MEASURE 6.2.11.** Remove physical barriers in kindergartens, schools and student dormitories and adapt facilities to children and students with difficulties. Equip kindergartens, schools and student dormitories with specific equipment essential for adequate participation of children and students with difficulties in the educational process.

COMPETENT BODY: MSES, local and regional self-government units, kindergartens, schools, student dormitories

IMPLEMENTATION: Founders of education institutions, kindergartens, schools, student dormitories

INDICATORS: Physical accessibility of all facilities of pre-tertiary education has been completely adapted to the standards as defined by the Ordinance on Ensuring Access to Buildings to Persons with Disabilities and to Persons with Reduced Mobility ('Official Gazette', No 78/13). Percentage of kindergartens, schools and student dormitories equipped with specific modern equipment.

- **MEASURE 6.2.12.** Sensitise all children, students, their parents and employees of kindergartens, schools and student dormitories to the specific needs of children and students with difficulties, and to the role of kindergartens, schools and student dormitories in meeting those needs at regular and homeroom classes, in lectures and workshops

COMPETENT BODY: AZOO/ETTA, kindergartens, schools, student dormitories

IMPLEMENTATION: Expert teams composed of experts from AZOO/ETTA, faculties and experienced practitioners

INDICATORS: All pre-school children and pupils, students attending the 3rd and 7th class of primary school and those attending the 2nd class of secondary school, as well as their parents, teachers, professionals in early childhood and pre-school education, other educational staff and school principals have completed sensitisation programmes for the inclusion of children and students with difficulties.

Systematic care for gifted students is strategically important for the development of a knowledge society that will facilitate economic and technological development and increase Croatia's international competitiveness. It is the education system that plays the key role in caring for gifted students, since it is the only factor that enables systematic early identification and support for the development of gifted students. It is therefore necessary to organise care for gifted students as a professional and continuous process that includes students of all ages, as well

as continuous cooperation between all institutions responsible for the education of gifted students.

In order to facilitate the development of gifted students' potential, it is necessary to individualise their education so that it is in accordance with their aptitudes, abilities and interests. This is only possible by introducing diversified and flexible methods and forms of work that can be adapted to gifted students.

- **MEASURE 6.2.13.** Develop and/or standardise instruments and procedures for the identification of potentially gifted students
COMPETENT BODY: MSES, AZOO/ETTA
IMPLEMENTATION: AZOO/ETTA, expert team composed of experts for the education of gifted students and of experienced practitioners
INDICATORS: Standardised instruments and procedures for the identification of potentially gifted students
- **MEASURE 6.2.14.** Prepare school work plans for gifted students that include the mastering of regular or differentiated syllabi
COMPETENT BODY: Schools
IMPLEMENTATION: School expert team
INDICATORS: Number of schools with annual work plans for gifted students
- **MEASURE 6.2.15.** Organise work with gifted students to enable work through programmes with different levels of complexity, including: optional programmes; group and individual work; work with a tutor; earlier enrolment; acceleration; extra-curricular and after-school activities; contacts with experts from a specific area of interest; and access to specific knowledge resources.
COMPETENT BODY: MSES
IMPLEMENTATION: Schools, school expert teams, AZOO/ETTA expert team, faculties
INDICATORS: 2 per cent of students in every school are included in the programmes and forms of work with gifted students. Number and percentage of schools implementing programmes for gifted students.
- **MEASURE 6.2.16.** Revise ordinances regulating the education of gifted students in order to enable the optimal identification, schooling, encouraging and monitoring of gifted students
COMPETENT BODY: MSES
IMPLEMENTATION: AZOO/ETTA, expert team composed of experts for the education of gifted students and of experienced practitioners
INDICATORS: Revised ordinances regulating the education of gifted students





6.3. BUILDING CAPACITY FOR A COMPREHENSIVE SUPPORT SYSTEM FOR CHILDREN AND STUDENTS

An effective support system for children and students requires the formation of teams in education institutions composed of adequately trained professionals (psychologists, pedagogues and educational rehabilitation experts). Besides providing direct support to children and students, these expert teams will coordinate all forms of support and the essential mechanisms for cooperation both within education institutions and with other relevant institutions, experts and organisations that take care of children and youth.

Furthermore, a comprehensive support system requires adequately trained professionals in early childhood and pre-school education, teachers and school principals. This is especially important when it comes to the inclusion of children and students with difficulties in the regular educational process.

Strategic capacity building in education institutions for providing support to children and students must include the preparation (or revision) of competence frameworks for all professionals in early childhood and pre-school education, teachers, school principals and other educational staff, as well as changes in their initial education and/or continuing professional development.

- **MEASURE 6.3.1** Employ an adequate number of professionals so that every kindergarten, primary school, secondary school and student dormitory has an expert team that will consist of at least two professionals. One of the expert team members must be a psychologist, whereas the other must be an educational rehabilitation expert (e.g. speech and language pathologist, social pedagogue) or a pedagogue, depending on the institution's specific needs. The total number of professionals should not be below the number specified in the applicable State Pedagogical Standard.

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, founders of education institutions

INDICATORS: All kindergartens, primary schools, secondary schools and student dormitories have formed expert teams in accordance with the number of children and students (by 2020 in kindergartens and primary schools; and by 2023 in secondary schools and student dormitories)

- **MEASURE 6.3.2.** Prepare/revise competence frameworks for (1) school support staff (pedagogues, psychologists, educational rehabilitation experts) and (2) teaching staff in early childhood and pre-school education, primary education and secondary education, so that they contain the competences needed for the provision of different forms of support to children/students, including support to children/students with difficulties and to gifted children/students

COMPETENT BODY: MSES, AZOO/ETTA

IMPLEMENTATION: University and AZOO/ETTA expert teams, professional associations/chambers

INDICATORS: Competence frameworks for school support staff adopted. Competence frameworks for teaching staff in early childhood and pre-school education, primary education and secondary education adopted.

- **MEASURE 6.3.3.** Align (re-define) programmes for (1) initial and specialist education of school support staff and (2) initial education of teaching staff in early childhood and pre-school education, primary education and secondary education with the new competence framework, so that the development of professional competences for the provision of different forms of support to children/students is incorporated into them, including support to children/students with difficulties and to gifted children/students

COMPETENT BODY: Higher education institutions implementing initial and specialist education of school support staff; higher education institutions implementing initial education of teaching staff in early childhood and pre-school education, primary education and secondary education; National Council for Education

IMPLEMENTATION: Expert teams of higher education institutions
INDICATORS: Number of adopted new programmes aligned with the competence frameworks for school support staff. Number of adopted new programmes aligned with the competence frameworks for teaching staff in early childhood and pre-school education, primary education and secondary education.

- **MEASURE 6.3.4.** Enhance the system of professional training of (1) school support staff and (2) teaching staff in early childhood and pre-school education, primary education and secondary education, so that it includes programmes for the development of professional competences for the provision of different forms of support to children/students, including support to children/students with difficulties and to gifted children/students

COMPETENT BODY: AZOO/ETTA

IMPLEMENTATION: AZOO/ETTA, university and school experts, professional associations/chambers

INDICATORS: Number of new programmes for the professional training of school support staff. Number of new programmes for teaching staff in early childhood and pre-school education, primary education and secondary education.

Besides capacity building of education institutions, it is necessary to establish two national networks of school support — one for supporting inclusive education and the other for supporting the education of gifted children/students.

Establishing an inclusive education support network will require linking





all institutions implementing inclusive education, the transformation of a certain number of education institutions in larger towns into centres of excellence in the area of inclusive education and the establishment of a functional network of mobile expert teams (METs). This network will also function as a system of school and teacher support.

- **MEASURE 6.3.5.** Establish a coordination centre for the inclusive education support network in AZOO/ETTA that will organise and coordinate activities (creating and maintaining a database, organising trainings, organising practice exchange, etc.)

COMPETENT BODY: AZOO/ETTA IMPLEMENTATION: AZOO/ETTA expert team

INDICATORS: Functional coordination centre established in AZOO/ETTA with one person responsible for coordinating the national network's operations and working full-time

- **MEASURE 6.3.6.** Establish mechanisms for the provision and/or organisation of expert support to kindergartens, schools and student dormitories

COMPETENT BODY: MSES, AZOO/ETTA

IMPLEMENTATION: Expert teams composed of experts from AZOO/ETTA, faculties, expert non-governmental organisations and experienced practitioners; relevant county departments

INDICATORS: Training of professionals, school principals, professionals in early childhood and pre-school education, and teachers. Counselling and supervision carried out.

- **MEASURE 6.3.7.** Establish a network of kindergartens/schools/student dormitories for mutual support (thereby creating an effective system of good practice exchange and efficient pathways for cooperation with institutions outside the education system)

COMPETENT BODY: MSES, AZOO/ETTA

IMPLEMENTATION: Experts from kindergartens, schools and student dormitories

INDICATORS: In every county, a network of institutions implementing inclusive education has been established and forms of cooperation have been defined. Annual training plans prepared in the area of inclusive education. Persons appointed to be responsible for counselling and supervision in the area of inclusive education. Annual plans prepared for funding kindergartens, schools and student dormitories for the development and realisation of inclusive education.

- **MEASURE 6.3.8.** Establish a coordination centre for the organisation of mobile expert teams' work in every county and the City of Zagreb

COMPETENT BODY: Local and regional self-government units and the City of Zagreb IMPLEMENTATION: Relevant county offices, AZOO/ETTA

INDICATORS: Coordination centre established for the work of mobile expert teams at county level established.

The support network for the education of gifted students will incorporate: programmes for the education of gifted students (cooperation between schools, universities, research institutes, associations, etc.); education institutions that have developed into centres of excellence in the area of the education of the gifted; and other relevant institutions (faculties, institutes, associations and other organisations). This network will also function as a system of school and teacher support.

- **MEASURE 6.3.9.** Gradually supplement or substitute the competition system with a network of summer and winter schools, courses and programmes of 'advanced learning' at the national, regional and local levels

COMPETENT BODY: MSES, AZOO/ETTA, AZVO/ASHE, ASOO/AVETAE, research institutes, universities, National Council for Education

IMPLEMENTATION: Experts for the education of gifted students (from universities and research institutes), practitioners (teachers, professionals in early childhood and pre-school education, school support staff, school principals) and members of relevant non-governmental organisations

- **MEASURE 6.3.10.** Establish a coordination centre for the network in AZOO/ETTA that will organise and coordinate activities (creating and maintaining a database, organising trainings and practice exchange...)

COMPETENT BODY: AZOO/ETTA

IMPLEMENTATION: AZOO/ETTA expert

INDICATORS: Functional coordination centre established in AZOO/ETTA

- **MEASURE 6.3.11.** Provide expert support to schools for their development into centres of excellence for the education of gifted students through building their capacity in this area (specific additional trainings of school support staff, school principals, teachers, counselling, supervision)

COMPETENT BODY: MSES, AZOO/ETTA, ASOO/AVETAE

IMPLEMENTATION: Experts for the education of gifted students (from universities and research institutes); practitioners (teachers, professionals in early childhood and pre-school education, professionals, school principals); members of expert non-governmental organisations; National and University Library and other libraries

INDICATORS: A minimum of 10 per cent of primary schools and 10 per cent of secondary schools in every county are transformed into centres of excellence for the education of gifted students

- **MEASURE 6.3.12.** Provide financial and expert support for the establishment of new and development of existing centres for





working with gifted students that operate outside of schools

COMPETENT BODY: MSES, AZOO/ETTA, ASOO/AVETAЕ

IMPLEMENTATION: MSES; experts for the education of gifted students (from universities and research institutes); practitioners (teachers, professionals in early childhood and pre-school education, school support staff, school principals); and members of other relevant organisations

INDICATORS: Support provided for the establishment of at least one centre for working with gifted students that operates outside of schools. Support provided for the development of at least five existing centres for working with gifted students that operate outside of schools.

6.4. EARLY SCHOOL LEAVING

Early school leaving can be a serious problem in the life of young people since it deprives them of the opportunity for acquiring the knowledge and skills that are essential for employment and, more generally, for coping with life more successfully. If early school leaving becomes more widespread, it will become a serious social problem in terms of being an obstacle to economic development, productivity and competitiveness, as well as disrupting social cohesion since it is related to poverty and social exclusion. Since one of the main goals of this Strategy is the provision of equal opportunities and accessibility of quality education to everyone, it is particularly important to ensure that all students successfully complete their planned educational path at the primary and secondary education level.

According to the definition used in the EU⁵⁵, the term 'early school leaving' refers to 'young people who have dropped out of school before the completion of secondary education and are no longer in education'. It is statistically defined as a percentage of persons between the ages of 18 and 24 who have not completed primary education (or have primary education as their highest educational attainment) and are no longer in education.

Despite the fact that EU statistical data indicate that Croatia has the lowest early school-leaving rate in the EU (amounting to only 4.2 per cent), early school leaving must be considered as an important part of education policy. It is therefore essential to ensure the existence of systems of early recognition of school-leaving risks, to design and introduce systems for registering and monitoring early school leaving, to develop early intervention mechanisms and to ensure procedures for reintegrating students who have dropped out of school back into the system in order to successfully complete their education. The proposed measures will also focus on prevention and intervention related to temporary or permanent drop-out. Compensatory measures may include the application of alternative forms of education by means of connecting with the world of work or by better involving the local community.

- MEASURE 6.4.1.** Develop and introduce a system of early recognition of school-leaving risks

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, local and regional self-government units, education institutions, social welfare centres

INDICATORS: Elements of early school leaving defined. National information system developed and introduced in all education institutions.
- MEASURE 6.4.2.** Implement systematic monitoring and research on the causes of early school leaving

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, universities and public research institutes

INDICATORS: System established for monitoring early school leaving at the national level, consisting of quantitative and qualitative indicators. Research carried out on the causes of early school leaving.
- MEASURE 6.4.3.** Develop and introduce support measures for students who are at risk of early school leaving at the level of education institutions (and in cooperation with other institutions)

COMPETENT BODY: MSES

IMPLEMENTATION: AZOO/ETTA, ASOO/AVETAЕ, education institutions

INDICATORS: Specific models developed for supporting students who are at risk of early school leaving
- MEASURE 6.4.4.** Develop compensatory mechanisms and flexible curricula for the acquisition of relevant qualifications, adapted to the specific needs and capabilities of students who are reintegrating back into the education system

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, local and regional self-government units, education institutions, the world of work

INDICATORS: Number and types of established personalised approaches for supporting the reintegration of students into the education system.

6.5. PREVENTIVE MEASURES

Regarding the issue of early school leaving and the broader issues of the forms and types of commending, rewarding and disciplining students in education institutions, it is essential to re-define the current system of preventive measures since it has proven to be insufficiently effective.

Education institutions are obliged, in line with their educational role and work, to prevent unacceptable forms of student behaviour, as well





as advise and assist students in solving problems they face. Schools are also obliged to monitor students' social problems and take measures to address their causes and consequences in cooperation with students' families, social welfare institutions and other competent bodies.

The current legal definitions of preventive measures due to the infringement of duties, non- fulfilment of obligations and violent behaviour have often proven ineffective in their application.⁵⁶ Certain well-devised measures such as an extended expert procedure are rarely implemented due to their complexity. There is an extreme disparity between education institutions when it comes to the criteria applied in imposing certain preventive measures. Moreover, there is disparity and a lack of systematic approach with regard to inter-sectoral cooperation in preventing and providing against unacceptable forms of behaviour. Finally, the responsibilities and rights of parents, educational staff and students regarding such forms of behaviour have not been appropriately defined. The system for commending and rewarding students is also insufficiently developed. Even in schools where such practices do exist, only the success of students in knowledge competitions and sports activities is rewarded. Preventive measures need to be developed to enable the rewarding of a much broader scope of children's/students' behaviour, thus having a positive impact on their behaviour and on their sense of belonging to the education institution.

- **MEASURE 6.5.1.** Re-define the system of preventive measures
COMPETENT BODY: MSES
IMPLEMENTATION: MSES
INDICATORS: New and effective system of preventive measures designed. New system of preventive measures introduced at education institutions.

6.6. PROVIDING SUPPORT TO CHILDREN AND STUDENTS OF THE ROMA NATIONAL MINORITY

In spite of the evident effects of the activities under the National Roma Plan⁵⁷ and the Action Plan for the Decade of Roma Inclusion⁵⁸ relating to education, access to quality education for Roma is still far from being equal.

In order to enhance the education of Roma, it is essential to compensate for the negative effects of severe social and cultural disadvantage faced by Roma children by using additional support mechanisms. One part of this support is ensured by this Strategy through mechanisms for student support within the education institution. Another part of the support must be organised by means of early intervention, which implies the full inclusion of Roma children in quality pre-school education lasting two years. Namely, a correlation exists between attending pre-school education programmes and educational performance: the longer the duration

of attendance (and the higher the quality of programme), the higher the educational performance. It is necessary to establish playrooms for pre-school children in Roma settlements where children would, learn the Croatian language while playing. A curriculum for the teaching of Romani language and culture will also be prepared. Finally, the enrolment of students from the Roma national minority in secondary schools must be particularly stimulated, which will be regulated by a special ordinance. Late enrolment in secondary education programmes will be allowed for members of the Roma national minority, in order to encourage them to acquire qualifications even after early school leaving.

- **MEASURE 6.6.1.** Fully fund two-year, high-quality programmes of integrated pre-school education for Roma in existing pre-school education institutions
 COMPETENT BODY: MSES, local and regional self-government units
 IMPLEMENTATION: Capacity of pre-school education institutions
 INDICATORS: Full inclusion of Roma children between the age of four and the school starting age in two-year quality programmes of integrated pre-school education
- **MEASURE 6.6.2.** Establish and fully fund two-year, high-quality quality alternative programmes of pre-school education for Roma in the areas where pre-school education institutions are not accessible (in cooperation with Roma associations, primary schools, etc.)
 COMPETENT BODY: MSES, local and regional self-government units
 IMPLEMENTATION: Experts in the area of early childhood and pre-school education, Roma associations, local self-government units, social welfare centres
 INDICATORS: Full inclusion of Roma children between the age of four and the school starting age in two-year quality programmes of integrated pre-school education
- **MEASURE 6.6.3.** Set up playrooms for pre-school children in Roma settlements
 COMPETENT BODY: Local and regional self-government units
 IMPLEMENTATION: Experts in the area of early childhood and pre-school education, Roma associations, local self-government units, social welfare centres
 INDICATORS: Playrooms in Roma settlements established
- **MEASURE 6.6.4.** Provide free late enrolment in secondary school programmes to members of the Roma national minority who previously dropped out of school
 COMPETENT BODY: MSES
 IMPLEMENTATION: MSES, local and regional self-government units, education institutions
 INDICATORS: Increased number of Roma national minority members who have completed a secondary school programme through late enrolment (compared to the current figures)





- **MEASURE 6.6.5.** Prepare a curriculum for teaching Romani language and culture
COMPETENT BODY: MSES
IMPLEMENTATION: AZOO/ETTA
INDICATORS: Curriculum prepared for teaching Romani language and culture

OBJECTIVE 7: PROVIDE OPTIMAL WORKING CONDITIONS FOR EDUCATION INSTITUTIONS

Important preconditions for high-quality education are the availability of education institutions, their organisation in a national network and their equipment. The State Pedagogical Standard of Pre-school Education ('Official Gazette', No 63/08 and 90/10) contains regulations stipulating the optimal spatial, staff, health, technical, IT and other prerequisites for ensuring adequate working conditions in education institutions.

The purpose of pedagogical standards is to enhance the operation of education institutions on a common basis, ensuring equal working conditions for all education institutions. In order to fulfil this purpose, it will be necessary to optimise of the network of pre-school institutions and schools, i.e. to harmonise education institutions with demographic, geographic, economic and educational variables.

The Network of Primary and Secondary Schools, Student Dormitories and Education Programmes was adopted in 2011('Official Gazette', No 70/11). The Network determines the conditions that are to contribute to the development of a high-quality, more accessible, more adaptable and efficient education system. The Network implies the creation of optimal conditions regarding: school size; number of classes; investment in the school equipment; employment of teachers and support staff; and management of school institutions.

The Ministry of Science, Education and Sports issued the Decision on Regulations for the Facilities and Equipment of School Buildings, School Sports Halls and School Playgrounds (2013), which is applied to projects aimed at the construction of new buildings and renovation of existing buildings. In addition, the Decision regulates work in one or two shifts in education institutions, whereby the preparation of a project must include the fulfilment of the necessary conditions for the full inclusion of students with physical disabilities.

The optimisation of the school and programme network should be further implemented in the upcoming period and should take into consideration demographic trends, geographic specificities and the needs of the economy, in cooperation and in accordance with the needs of the local community.

It is also necessary to create a network of pre-school institutions that is based on continuous monitoring of the demographic situation and population projections at the local level. The network of pre-school institutions will enable efficient planning and the realisation of spatial, material, staff, technical and other conditions.

Besides creating the network, it seems important to enable the transformation of schools in the local community into centres for lifelong learning, culture and sport. It is also important to encourage the implementation of different public needs programmes (for children with difficulties, gifted children, national minority children and children in pre-school education) and of other activities in order to meet the needs and interests of children and youth.

The planned measures must be adapted to demographic trends. The number of children in Croatia has been systematically decreasing, which has resulted in a decrease in the number of children included in pre-tertiary education.⁵⁹

According to population projections⁶⁰ and due to a continuous decline in the number of children, it is expected that fewer children will be entering pre-tertiary education. The number of primary school children will drastically decrease by 2031, which will also be the case with secondary school children. Consequently, what can be expected is the need for a smaller number of teachers, a spontaneous transfer to one-shift work and the potential closing of schools.

The analysis of the current working conditions in education institutions clearly shows that neither the current network nor the working conditions are optimal (state of the buildings, their equipment, etc.). Another problem is the fact that the working conditions are unequal, thus putting the ensuring of equal opportunities for all children at risk. There are kindergartens and schools that are very well equipped, whereas some of them can barely operate under the current conditions. There is no clear strategy for capital investment and investment maintenance in the funding system, and the criteria are insufficiently clear and insufficiently specific. There are no clear or strict guidelines for the functional and efficient construction of pre-school and school facilities. It has been noticed that the founders of these education institutions have been constructing such facilities that are irrationally expensive and whose maintenance is a heavy burden for both the local and state budget.

This Strategy aims to establish a system with an optimal network of education institutions (kindergartens, schools and student dormitories), which will allow a more efficient (and autonomous) management of funds provided through the state budget (assuming a sufficient level of funds are provided). The Strategy also aims to ensure that schools are functionally and equally equipped, that they offer the possibility of extended school attendance and that they provide programmes that meet students'





specific developmental needs, as well as the needs of the labour market.

The harmonisation of schooling conditions will ensure equal opportunities to children/students for schooling and the acquisition of core competences for the continuation of education or access to the labour market.

7.1. ESTABLISHING AN OPTIMAL NETWORK OF EDUCATION INSTITUTIONS

A) PRE-SCHOOL INSTITUTIONS

Greater inclusion of children of pre-school age into pre-school institutions implies the establishment of a network of institutions that will enable the inclusion of all Croatian children in this education subsystem.

- **MEASURE 7.1.1.** Carry out an analysis of the organisation and structure of pre-school education by counties/regions. Analyse the material and staff working conditions of pre-school institutions by counties/regions. Estimate the needs in the pre-school education system for the creation of a pre-school network. Prepare guidelines for the optimisation of the network of pre-school institutions.
COMPETENT BODY: MSES, local and regional self-government units
IMPLEMENTATION: MSES, AZOO/ETTA, state administration offices, local and regional self-government units, independent experts
INDICATORS: Analysis carried out, containing the assessment of the situation and guidelines for capacity building
- **MEASURE 7.1.2.** Create and adopt the Network of Pre-school Institutions
COMPETENT BODY: Government of the Republic of Croatia, founders of pre-school education institutions
IMPLEMENTATION: MSES, AZOO/ETTA, state administration offices
INDICATORS: Network of Pre-school Institutions adopted at the national level.

B) PRIMARY EDUCATION INSTITUTIONS AND SECONDARY EDUCATION INSTITUTIONS PROVIDING GRAMMAR SCHOOL (GYMNASIUM) PROGRAMMES

To obtain a high-quality primary and secondary education system, it is necessary to optimise the network of school institutions and to ensure it is in accordance with the provisions of the state pedagogical standards. In order to reduce disparities in the system, it is necessary to define equal criteria for selecting primary and secondary schools to be awarded a special status and make it possible for school facilities to also serve a different purpose or introduce other programmes in school institutions, along with the current programmes (e.g. programmes for pre-school children). While creating the Network, demographic, geographic and economic needs must be taken into account, as well as the possibilities

for reducing the practice of having inadequately qualified teachers in smaller schools and in the areas of special state concern (according to economic, demographic and structural criteria). What also needs to be taken into consideration are the possibilities for rationalising the system by reducing the number of unnecessary administrative workplaces and their substitution by means of employing school support professionals (psychologists, pedagogues or educational rehabilitation experts).

- **MEASURE 7.1.3.** Carry out an analysis of the Network of Primary and Secondary Education Institutions Providing Grammar School (Gymnasium) Programmes by counties/regions. Analyse the material and staff working conditions in schools by counties/regions. Estimate the needs in the school education system and define criteria for the optimisation of the school network.

COMPETENT BODY: MSES, local and regional self-government units

IMPLEMENTATION: MSES, AZOO/ETTA, state administration offices, local and regional self-government units, independent experts

INDICATORS: Analysis carried out of the Network by counties/regions, containing guidelines for optimisation. Criteria for the optimisation of the school Network adopted.

- **MEASURE 7.1.4.** Prepare an optimal School Network project
COMPETENT BODY: Government of the Republic of Croatia, local and regional self-government units
IMPLEMENTATION: MSES, AZOO/ETTA, state administration offices
INDICATORS: Optimal School Network project prepared

- **MEASURE 7.1.5.** Establish an optimal network of primary education institutions and secondary schools providing grammar school (gymnasium) programmes
COMPETENT BODY: Government of the Republic of Croatia, local and regional self-government units
IMPLEMENTATION: MSES, state administration offices
INDICATORS: Percentage of primary schools and grammar schools (gymnasias) of optimal size. Percentage of schools meeting the standards for material and staff working conditions.





C) SECONDARY EDUCATION INSTITUTIONS PROVIDING VOCATIONAL PROGRAMMES

The current vocational school network system is not in line with the needs of the economy and labour market. The same or similar programmes are implemented at different locations, but real needs based on demographic and geographic diversity are not taken into account. Such a system is much too expensive and cannot ensure equal quality on the entire territory of Croatia.

Programmes must therefore be linked — in other words, current programmes for related occupations must be compiled into a single programme for a given qualification.

- **MEASURE 7.1.6.** Carry out an analysis of the alignment of vocational programmes with the development needs of counties/regions. Carry out an analysis of occupations in demand regarding the developmental needs of counties/regions and propose the preparation of new qualifications standards and corresponding curricula.

COMPETENT BODY: MSES, local and regional self-government units

IMPLEMENTATION: MSES, sector councils and the National Council for the Development of Human Potential (HKO/CROQE), ASOO/AVETAЕ, state administration offices, local and regional self-government units, independent experts

INDICATORS: Analyses carried out. Recommendations prepared.

- **MEASURE 7.1.7.** Analyse material and staff working conditions and development capacities of vocational schools in counties/regions. Estimate regional capacities for the implementation of practical instruction and linking vocational education and training with the world of work.

COMPETENT BODY: MSES, local and regional self-government units

IMPLEMENTATION: ASOO/AVETAЕ, independent experts

INDICATORS: School capacity analysis carried out. Analysis carried out regarding the alignment of programmes with development needs of regions. Guidelines prepared for the rationalisation/optimisation of the vocational school network.

- **MEASURE 7.1.8.** Prepare a plan for the necessary changes in regional networks of vocational schools and programmes

COMPETENT BODY: MSES, local and regional self-government units

IMPLEMENTATION: MSES, National Council for the Development of Human Potential (HKO/CROQE), ASOO/AVETAЕ, state administration offices, local and regional self-government units, independent experts

INDICATORS: Guidelines prepared for the optimisation of the vocational school network

- **MEASURE 7.1.9.** Prepare a project on the Network of Vocational Schools and Programmes
 COMPETENT BODY: MSES
 IMPLEMENTATION: MSES, National Council for the Development of Human Potential (HKO/CROQF), ASOO/AVETAЕ, state administration offices, local and regional self-government units, independent experts
 INDICATORS: Project prepared for the Network of Vocational Schools and Programmes
- **MEASURE 7.1.10.** Establish an optimal (rational and efficient) Network of Vocational Schools and Programmes
 COMPETENT BODY: MSES
 IMPLEMENTATION: MSES, local and regional self-government units
 INDICATORS: Efficient network of institutions for vocational education and training established. Level of reduction of the number of schools providing equivalent programmes. Level of connection with the world of work. Percentage of well-equipped schools showing a tendency toward specialisation in a certain area of work. Clear admission criteria defined and criteria defined for the implementation of vocational programmes in line with societal needs and the needs of the economy.

D) ESTABLISHING REGIONAL COMPETENCE CENTRES FOR VOCATIONAL EDUCATION AND TRAINING

Regional competence centres for vocational education and training must be established that are connected with the world of work. Their equipment and professional staff will be the means of implementing quality vocational education and training.

- **MEASURE 7.1.11.** Prepare and implement a plan for the development of regional competence centres for vocational education and training
 COMPETENT BODY: MSES, National Council for the Development of Human Potential
 IMPLEMENTATION: ASOO/AVETAЕ, education departments of other ministries, HGK/CCE, HOK/CCTC, HZZ/CES
 INDICATORS: Adoption and implementation of the plan for the development of the national network of regional competence centres for vocational education and training
- **MEASURE 7.1.12.** Ensure active participation of local communities in the development of vocational education and training in counties/regions. Establish regional cooperation committees that take care of the development of vocational education and training in counties/regions.
 COMPETENT BODY: MSES, MRRFEU/MRDEUF, local and regional self-government units
 IMPLEMENTATION: County departments for social affairs, regional





cooperation committees (business companies, HGK/CCE, HOK/CCTC, HZZ/CES, competence centres, schools)

INDICATORS: Regional cooperation committees established. Level of local community's responsibility for the quality of work of the centres/schools.

- **MEASURE 7.1.13.** Provide staff and material equipment for the regional competence centres in line with technology development and labour market needs. Construct/equip student dormitories in line with the needs of competence centres.

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, local and regional self-government units

INDICATORS: Level of provision of staff and material equipment in the centres with student dormitories. Level of harmonisation with technology development and labour market needs. Level of adequacy of accommodation and support for personal and social development.

E) SCHOOL INSTITUTIONS FACED WITH ADVERSE WORKING CONDITIONS

Schools faced with adverse working conditions are schools located in areas such as islands, hills and mountains or other areas that are poorly connected by transport modes, as well as schools in the areas of the first group of special state concern (affected by war).

These schools are especially important for the local social community and as such, they are not required to meet minimum standards as defined by the State Pedagogical Standard⁶¹ determining the number of students or classes. Due to special circumstances, a school faced with adverse working conditions may have a smaller number of classes or may form combined classes. The status of schools faced with adverse working conditions is determined by special regulations.

With regard to changes in demographic trends and to the non-alignment of criteria for identifying which schools can be considered as facing adverse working conditions, it is necessary to define common criteria for obtaining/retaining the status of schools faced with adverse working conditions and incorporate them in the network of all schools.

- **MEASURE 7.1.14.** Carry out an analysis on school institutions faced with adverse working conditions
COMPETENT BODY: MSES, local and regional self-government units
IMPLEMENTATION: MSES, AZOO/ETTA, state administration offices, local and regional self-government units, other ministries, independent experts
INDICATORS: Analysis carried out, including recommendations

- **MEASURE 7.1.15.** Define common criteria for identifying schools faced with adverse working conditions. Amend regulations in the

school system on the basis of common criteria for identifying school institutions faced with adverse working conditions.

COMPETENT BODY: Government of the Republic of Croatia, founders of education institutions

IMPLEMENTATION: MSES, independent experts

INDICATORS: Adoption of new common criteria for singling out schools with aggravating working conditions. Adoption of new harmonised regulations.

F) STUDENT DORMITORIES

Student dormitories are education institutions within the secondary education system that provide students with accommodation and meals. Within student dormitories, optional and special education programmes provide support and assistance to students and parents in receiving quality education and in ensuring the student's overall development. There are 56 student dormitories in Croatia, out of which 23 are within secondary schools, and 33 are independent institutions. Student dormitories are usually located in converted buildings and only seven of them were originally constructed to serve the purpose of a student dormitory, five of them have been completely and well adapted, and others have been partially adapted and adjusted to needs. The number of students in bedrooms ranges from two to ten students. The dormitories do not have adequately furnished and equipped facilities for optional and special programmes, they lack proper living rooms, they have old and outdated equipment and they lack external facilities and sports halls.

The capacity of the existing student dormitories is 8.702 students, the occupancy rate being around 6.740 secondary school students and around 1.377 university students

Besides an optimal network of vocational schools, what also needs to be defined is the network of student dormitories that are well-equipped at the infrastructural, material and staff levels. In addition, basic education programmes need to be defined for student dormitories and adequately high pedagogical standards must be laid down (higher service quality, better staff provision, better education programmes, smaller number of students in bedrooms, better and healthier nutrition, greater safety, etc.). Student dormitories also play an important role in ensuring equal conditions and opportunities for all students, thus reflecting care for young people and support to students, parents and schools.

- **MEASURE 7.1.16.** Carry out an analysis of the status of student dormitories by counties/regions. Analyse the material and staff working conditions in student dormitories.

COMPETENT BODY: MSES, local and regional self-government units

IMPLEMENTATION: MSES, AZOO/ETTA, state administration offices, local and regional self-government units, Student Dormitories Association





INDICATORS: Analysis carried out containing recommendations. Preparation and adoption of new uniform standards for the student dormitories regulating material and staff working conditions.

- **MEASURE 7.1.17.** Prepare a programme for a network of student dormitories in the context of the establishment of an optimal school network
COMPETENT BODY: MSES, local and regional self-government units
IMPLEMENTATION: MSES, competent ministries, AZOO/ETTA, ASOO/AVETAE, state administration offices, local and regional self-government units, Student Dormitories Association
INDICATORS: Programme prepared for the network of student dormitories. Level of alignment with the programme for the establishment of an optimal school network.
- **MEASURE 7.1.18.** Establish an optimal network of student dormitories
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: MSES, local and regional self-government units
INDICATORS: Number of well-equipped and well-staffed student dormitories.

7.2. HARMONISATION OF WORKING CONDITIONS IN EDUCATION INSTITUTIONS

There are huge discrepancies when it comes to spatial conditions and equipment in education institutions, as well as staff provision within the system.

The harmonisation of working conditions is important for achieving equal development within the education system and for providing equal opportunities for all children/students to participate in a high-quality educational process.

- **MEASURE 7.2.1.** Carry out an analysis of the working conditions in pre-school and school institutions in counties/regions for the purpose of constructing, upgrading and renovating the existing or new facilities
COMPETENT BODY: MSES, local and regional self-government units
IMPLEMENTATION: MSES, AZOO/ETTA, ASOO/AVETAE, state administration offices, local and regional self-government units, other ministries, independent experts
INDICATORS: Analysis carried out regarding the working conditions in education institutions in counties/regions
- **MEASURE 7.2.2.** Prepare a proposal of measures for reducing existing discrepancies. Develop clear guidelines for the functional and efficient construction and equipping of kindergartens and schools. Provide funds for effective implementation of pedagogical

standards in all education institutions.

COMPETENT BODY: Government of the Republic of Croatia, local and regional self-government units

IMPLEMENTATION: MSES, AZOO/ETTA, ASOO/AVETAE, state administration offices, local and regional self-government units, other ministries, independent experts

INDICATORS: Analysis carried out and guidelines developed.

Amount of funds provided in the state budget and budgets of local and regional self-government units. Number of pre-school and school institutions included in EU funding.

- **MEASURE 7.2.3.** Construct and equip pre-school and school institutions with the aim of harmonising working conditions

COMPETENT BODY: Government of the Republic of Croatia, local and regional self-government units

IMPLEMENTATION: MSES, AZOO/ETTA, ASOO/AVETAE, state administration offices, local and regional self-government units, other ministries, independent experts

INDICATORS: Number of equipped education institutions per year.

Number of constructed, upgraded and renovated existing or new facilities. Level of harmonisation of working conditions.

7.3. INTRODUCTION OF EXTENDED SCHOOL ATTENDANCE

There is an increasing number of institutions within the primary education system working in one shift. Extended school attendance must be introduced in primary schools working in one shift in order to facilitate the implementation of new programmes based on the interests and needs of both students and parents. Regarding younger students, organisation in the form of extended school attendance is possible. Cooperation with the local community (i.e. founders of school institutions) is needed regarding co-funding and identifying the needs and possibilities for introducing extended school attendance. Moreover, it is suggested to consider the possibilities for organising work during school holidays.

- **MEASURE 7.3.1.** Carry out an analysis of the possibilities for organising extended school attendance in school institutions by counties/regions and prepare a proposal for measures for organising extended school attendance

COMPETENT BODY: MSES, local and regional self-government units

IMPLEMENTATION: MSES, local and regional self-government units, independent experts

INDICATORS: Proposal of measures prepared. Amount of funds provided in the state budget and budgets of local and regional self-government units. Preparation of a proposal for the school network in towns/cities, municipalities and counties where extended school attendance will be organised.





- **MEASURE 7.3.2.** Draft new regulations stipulating teachers' work in extended school attendance and new duties of educational and auxiliary technical staff
COMPETENT BODY: MSES
IMPLEMENTATION: MSES, AZOO/ETTA, National Council for Education, experts in the field of pedagogical sciences
INDICATORS: New regulations adopted
- **MEASURE 7.3.3.** Gradually introduce programmes for extended school attendance in school institutions. Provide the necessary facilities for the introduction of extended school attendance.
COMPETENT BODY: MSES, local and regional self-government units
IMPLEMENTATION: MSES, AZOO/ETTA, teachers
INDICATORS: Percentage of institutions implementing extended school attendance. Percentage of institutions with provided facilities.

7.4. ENHANCEMENT OF THE WORK OF EDUCATION INSTITUTIONS IMPLEMENTING SPECIAL EDUCATION PROGRAMMES FOR STUDENTS WITH DIFFICULTIES

Although inclusive education must be encouraged, there remains a need for a certain number of special education institutions for children with difficulties. Several ministries are competent for these institutions (Ministry of Science, Education and Sports, Ministry of Health and Ministry of Social Policy and Youth). It is therefore necessary to distribute tasks, authority and funds, resulting in better internal organisation and better work. The introduction of new and up-to-date syllabi, special expert procedures and rehabilitation programmes will significantly enhance the education of children with difficulties. The introduction of new occupations and training levels will facilitate access to the labour market. Expert capacities of existing institutions must be strengthened, while professional training must be enhanced in order to bring practice in line with contemporary knowledge and achievements in the scientific area of education rehabilitation. It is necessary to expand the work of special education institutions by providing educational rehabilitation support in the formal education system, as well as expert support to parents. The effective functioning of institutions that provide special programmes must be ensured so that they may serve as support centres for early intervention, educational rehabilitation and diagnostics. These institutions should become places where children with difficulties attending both special and formal education institutions will receive assistance that is free of charge and rehabilitation procedures, while parents and teachers will receive expert advice and assistance. Establishing mobile expert teams will greatly contribute to the quality of inclusive education. The establishment of protective workshops for the training of students for occupations that are in line with the needs of life and the labour market will boost prospects for inclusive employment.

- MEASURE 7.4.1.** Analyse and, if appropriate, revise the network of education institutions implementing special education programmes for students with difficulties

COMPETENT BODY: MSES, local and regional self-government units

IMPLEMENTATION: MSES, Ministry of Social Policy and Youth, AZOO/ETTA, ASOO/AVETAЕ, state administration offices, associations, other ministries, independent experts

INDICATORS: Analysis carried out. If appropriate, revision of network of education institutions implementing special education programmes for students with difficulties
- MEASURE 7.4.2.** Distribute tasks, authority and funds between institutions for children with difficulties. Regulate obligations and funding of institutions implementing special programmes for children with difficulties.

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, Ministry of Social Policy and Youth

INDICATORS: Decision of the Government of the Republic of Croatia
- MEASURE 7.4.3.** Transform education institutions implementing special programmes for children with difficulties into competence centres for supporting formal education institutions by providing advisory support services through mobile expert teams

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, AZOO/ETTA

INDICATORS: Transformation action plans prepared. Number of employees trained for working in mobile expert teams. Preparation of new statutes of education institutions implementing special programmes for children with difficulties. Number of institutions transformed into competence centres.
- MEASURE 7.4.4.** Prepare syllabi for new qualifications for students with difficulties

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, Ministry of Social Policy and Youth, AZOO/ETTA, ASOO/AVETAЕ, state administration offices, associations, independent experts

INDICATORS: Number of prepared programmes. Level of equipment provision regarding supplementary teaching materials and teaching aids. Level of implementation of new programmes. Level of participants' satisfaction.
- MEASURE 7.4.5.** Equip existing education institutions for students with difficulties based on their needs

COMPETENT BODY: MSES, local and regional self-government units

IMPLEMENTATION: MSES, AZOO/ETTA, local and regional self-government units

INDICATORS: Number of equipped institutions per year. Number of renovated existing facilities.





- **MEASURE 7.4.6.** Define the criteria for obtaining the status of an expert-development centre. Determine expert-development centres (competence centres) in the area of inclusive education
COMPETENT BODY: MSES, AZOO/ETTA
IMPLEMENTATION: MSES, AZOO/ETTA, mentors and advisers, local and regional self- government units
INDICATORS: Defined criteria for obtaining the status of an expert-development centre. Number of established expert-development centres.
- **MEASURE 7.4.7.** Develop training programmes based on self-directed planning
COMPETENT BODY: MSES, AZOO/ETTA
IMPLEMENTATION: MSES, AZOO/ETTA, education institutions implementing special programmes for children with difficulties
INDICATORS: Number of prepared training programmes based on self-directed planning

7.5. E-SCHOOL: COMPREHENSIVE INFORMATISATION OF THE EDUCATIONAL PROCESS AND THE SCHOOL OPERATION PROCESS

E-learning consists of a group of services forming the basic information infrastructure for the educational process, from early childhood and pre-school education through to the higher education and science systems. In the area of e-learning, it is essential to launch a coordinated, comprehensive and dynamic activity in order to rapidly form into an information society (in line with the Programme e-Croatia, 2007). Besides investing in the development of e-infrastructure and broadband Internet access for citizens, state administration bodies, education and scientific institutions, it is necessary to carry out strategic planning and invest in the development of electronic content and services.

The Strategy of the Ministry of Science, Education and Sports for the 2012–2014 period especially highlights the use of high technology, while the Digital Agenda pays special attention to the development of e-skills and broadband Internet access. The e-School project proposal is based on the aforementioned strategies, and its implementation will significantly enhance the operational and educational processes within education institutions.

The activities that will enable schools to become digitally mature and ready for contemporary teaching are the following: connecting schools to ultra-fast Internet; construction of local networks; digitalisation of educational content and its general accessibility; and support for and training of teachers for the application of technologies in teaching and the use of e- services.

According to European benchmarks, there are four maturity levels for schools: digital beginners, digitally strengthened, digitally capable and

digitally mature. According to the currently available data from the CARNet user base, 83 per cent of schools belong to the two lowest categories considering the fact that only 17 per cent of Croatian schools are connected to broadband Internet, with most of them using only a few possibilities provided by broadband Internet access. Such possibilities include: cooperation between schools in real time; using videoconferencing during the teaching process for the purposes of distance learning or experimenting from a distance; and cooperation between schools outside national borders, cooperation with other European schools (e.g. through e-twinning or projects funded by the Lifelong Learning Programme).

USE OF ICT FOR OPERATIONAL AND ADMINISTRATIVE PROCESSES WITHIN EDUCATION INSTITUTIONS

There are operational and educational processes taking place within the education institution that are essential for the functioning of the institution as a whole. There is a need to establish services based on information and communication technologies (ICT) for the improvement of school operation activities, in line with the needs of schools, the school staff, students and the education system in general. It is therefore necessary to develop services that will enable the use of ICT in the processes taking place within schools, such as school operation activities and communication within the school and with the public, which would result in efficient and transparent school management, easy monitoring of the staff policy, reduced total funds for common public procurement, as well as faster and easier communication and exchange of e- documents between schools, schools' stakeholders and founders.

- **MEASURE 7.5.1.** Establish data centres for the provision of services to education institutions
COMPETENT BODY: MSES
IMPLEMENTATION: CARNet, University Computing Centre (SRCE)
INDICATORS: Number of established data centres for the needs of education institutions. Percentage of education institutions using the services of data centres. Level of user satisfaction.
- **MEASURE 7.5.2.** Develop services for the use of ICT for operational processes within education institutions
COMPETENT BODY: MSES IMPLEMENTATION: CARNet, school founders
INDICATORS: Number of established services supporting school operation activities. Percentage of education institutions using the established services. Level of user satisfaction.



OBJECTIVE 8: ESTABLISH AN EDUCATION QUALITY ASSURANCE SYSTEM



Quality assurance is a comprehensive term that refers to the procedures and practice of achieving, upholding and enhancing quality in specific areas of education. It is based on a permanent and continuous evaluation of the education system, its institutions and programmes.

Within the framework of quality assurance, systematic analyses are conducted with the aim of making valid judgements and decisions for the enhancement of educational practice and the achievement of positive goals in education. This reflects an approach to education policy according to which decision-making and the defining of development plans are based on relevant and well-argued indicators.

There is no clearly structured and coherent education quality assurance system in Croatia. Neither the evaluation of the system management quality nor the monitoring of the efficiency of the work of agencies operating within the system have been established. There is no systematic external evaluation of education institutions, nor has the systematic monitoring of the quality of work of the main stakeholders in the system (school principals, professionals in early childhood and pre-school education, teachers and other educational staff) been established.

Various forms of external evaluation of students' educational achievements are implemented at the national level (national examinations and State Matura examinations) and certain models for school self-evaluation have been tested. However, it is estimated that these procedures are inadequately interrelated and are not sufficiently used for the enhancement of school practice.

With the purpose of assuring and enhancing the quality of education, it seems important to connect the existing forms of external and internal evaluation (as well as develop new ones), and to use their synergistic potential more effectively.

The Strategy proposes to establish a comprehensive education quality assurance system that would: (1) facilitate the integration of various evaluation procedures with the purpose of achieving high quality of institutional work and better educational outcomes; and (2) ensure a higher level of responsibility of all stakeholders in education.

In this context, the principles for the organisation and functioning of the system would be the following:⁶²

- Quality assurance procedures apply to all institutions and all stakeholders in the education system.
- All institutions must develop an internal quality culture and

establish their own quality system. This includes setting internal standards and preparing plans and projects for achieving those standards. It is essential to strengthen the internal capacity of education institutions for self-analysis, self-evaluation and strategic- and project planning.

- All institutions must be subject to periodic reviews conducted by authorised external assessment bodies.
- Quality covers a number of factors, including the specificities of the environment and material conditions of the institution, human and organisational capacities, work programmes and methods, as well as learning outcomes.
- The quality assurance system should use various evaluation methods. Both the particularities of the context and the opinions and experiences of all stakeholders in the system are thereby taken into consideration.
- Evaluation results are to be used as corrective mechanisms and guidelines for enhancing the quality of work and for achieving better results and learning outcomes.
- Quality assurance is not seen as having a controlling or coercive role in the education system and among its stakeholders. It uses its own mechanisms, forms of evaluation and quality monitoring as a form of positive impact that does not pose a risk, but instead encourages positive motivation, networking and cooperation between education institutions and stakeholders involved.

With the aim of achieving the strategic objective of education quality assurance, it is essential to: (1) raise the overall quality of management of the education system; (2) functionally transform and build the internal capacity of national agencies that are obliged to provide support to education institutions and other stakeholders in the process of developing and assuring high quality and success in their work; and (3) establish the efficient management of the quality assurance system.

8.1. RAISING THE QUALITY OF MANAGEMENT OF THE EDUCATION SYSTEM

The achievement of reform interventions proposed by this Strategy mostly depends on the capacities of the institutions and bodies in charge of managing the education system at all levels.

It is therefore essential to (1) raise the management capacities of relevant institutions and (2) incorporate mechanisms for coordinating reform interventions, common planning and activities of different governing bodies and agencies, as well as monitoring their impact.

Initiatives that have so far been undertaken to raise the quality of the education system have not significantly contributed to the improvement of education in Croatian schools. This was largely due to a lack of qualified





governing structures and to the inadequate management competences of key stakeholders in the education system.

Reform measures have often been implemented separately and in a non-coordinated manner, lacking a clear strategic vision that would achieve synergy and address weaknesses of the system. In addition, the implementation of certain measures has not been accompanied by an adequate impact assessment that would serve as a basis for the planning of education policy and for making relevant decisions. These weaknesses are the consequence of inadequate capacities for analysis, strategic planning, coherent education policy management and harmonised action regarding the transformation of different parts of the education system. Administrative staff at the level of central and local government and in relevant government agencies need training in the area of education policy and system management in order to be able to respond to ever greater challenges faced by the Croatian education system.

- **MEASURE 8.1.1.** Ensure professional competences of employees in the bodies responsible for education system management (local and regional self-government units, state administration offices in counties, Ministry of Science, Education and Sports)
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: MSES
INDICATORS: Number of trained experts in the education management system. Specialist programmes developed regarding this area of education policy.
- **MEASURE 8.1.2.** Establish and ensure mechanisms for common planning, coordinating and monitoring of education policy measures of competent governing bodies and agencies
COMPETENT BODY: MSES
IMPLEMENTATION: MSES, local and regional self-government units, state administration offices in counties, AZOO/ETTA, ASOO/AVETAE, NCVVO/NCEE
INDICATORS: Establishment of mechanisms for common planning, coordinating and monitoring of education policy measures of the competent governing bodies

8.2. FUNCTIONAL TRANSFORMATION AND CAPACITY BUILDING OF THE NATIONAL AGENCIES

One of the main intentions of this Strategy in the area of early childhood and pre-school education, primary education and secondary education is to launch the transformation of education institutions (kindergartens, schools and student dormitories) into organisations that continually work on the enhancement of their quality or their own development.

The majority of education institutions are relatively small organisations

and therefore have difficulty in providing all the necessary professional resources needed for the enhancement of their quality and development. Providing them with continued systematic support is therefore essential. Support is currently provided to education institutions by national agencies (Education and Teacher Training Agency — ETTA; the Agency for Vocational Education and Training and Adult Education — AVETAE; and the National Centre for External Evaluation of Education — NCEE). However, such support is still inadequate and does not entirely respond to the real needs of the institutions.⁶³

By giving more autonomy to kindergartens, schools and student dormitories, their needs for different forms of expert support will additionally increase, especially in the following areas: curriculum development; quality enhancement; continuing professional development; institution management; strategic planning; self-evaluation; development projects; EU projects; etc. It is therefore necessary to carry out the functional transformation of national agencies and build their capacity. The aim of functional transformation is to expand the work of these agencies by introducing new forms of support, while capacity building implies increasing their expertise (increasing the number of competent advisers, continuing training of staff, organising a network of permanent external associates and cooperative institutions, etc.).

- **MEASURE 8.2.1.** Implement self-evaluation and independent external evaluation of the national agencies responsible for education
 COMPETENT BODY: MSES
 IMPLEMENTATION: Self-evaluation: AZOO/ETTA, ASOO/AVETAE, NCVVO/NCEE; External evaluation: Expert working group composed of external experts (international group)
 INDICATORS: Implementation of quality self-evaluation and independent external evaluation of the national agencies. Usability of gathered data for functional transformation and for building the capacity of the agencies.
- **MEASURE 8.2.2.** Prepare a strategic plan for the functional transformation and building the capacity of the agencies
 COMPETENT BODY: MSES
 IMPLEMENTATION: Expert working group, AZOO/ETTA, ASOO/AVETAE, NCVVO/NCEE
 INDICATORS: Strategic plan prepared and adopted
- **MEASURE 8.2.3.** Launch functional and organisational transformation of the agencies
 COMPETENT BODY: MSES
 IMPLEMENTATION: AZOO/ETTA, ASOO/AVETAE, NCVVO/NCEE
 INDICATORS: Number and types of new forms of support to education institutions. Harmonisation of new and adapted forms of support in line with the needs of beneficiaries. Level of transformation of the agencies with regard to new functions.





- **MEASURE 8.2.4.** Build internal capacity of the agencies (increase the number of advisers and professional trainings)
COMPETENT BODY: MSES
IMPLEMENTATION: AZOO/ETTA, ASOO/AVETAE, NCVVO/NCEE, faculties, institutes, professional associations
INDICATORS: Number of professional trainings. Number of professionally trained advisers. Capacity level of the agencies with regard to needs.
- **MEASURE 8.2.5.** Implement regular periodic self-evaluation and external evaluation of the agencies
COMPETENT BODY: MSES
IMPLEMENTATION: For self-evaluation: AZOO/ETTA, ASOO/AVETAE, NCVVO/NCEE; for external evaluation: expert working group composed of external experts (international group)
INDICATORS: Implementation of quality self-evaluation and independent external evaluation of the national agencies. Usability of gathered data for decision-making and development.

8.3. MANAGING THE EDUCATION QUALITY ASSURANCE SYSTEM

The management of the quality assurance system must ensure the coherence and synergetic impact of different approaches and procedures that already exist within the system or have yet to be developed. In order to ensure successful management, the following activities must take place:

- planning quality assurance policy in education institutions;
- coordinating all programmes and activities in the area of quality assurance and enhancement at the national level;
- strengthening organisational and human capacities for the application and use of quality assurance procedures at all levels;
- preparing methodology and materials that can be used in the quality assurance process;
- analysing the efficiency of implemented procedures and reporting and disseminating results.

The management of such a complex system requires clearly defined roles and competence levels among the stakeholders of the education system that implement procedures for quality assurance and enhancement (i.e. competent ministries, local and regional self-government units, agencies within the education system, kindergartens, schools and student dormitories).

The proposal of this Strategy is to establish a unit for managing and developing the education quality assurance system (EQA) at the Ministry of Science, Education and Sports.⁶⁴

- **MEASURE 8.3.1.** Establish a unit responsible for education quality assurance (EQA); ensure the efficient management of the pre-school

and school education quality assurance system

COMPETENT BODY: MSES IMPLEMENTATION: MSES

INDICATORS: Legal solution adopted. Unit established. Assessment of the extent to which the management of the system is operational.

The framework for the education quality assurance system is determined by three approaches:

- self-evaluation of education institutions;
- external evaluation of education institutions;
- enhancing the system of external evaluation of learning outcomes.

Interconnecting and coordinating these approaches and procedures may have a great transformational potential for the further development of institutions in the education system and for achieving better outcomes in their work. Moreover, an integral part of the quality assurance system is the monitoring and evaluation of the work of educational staff (professionals in early childhood and pre-school education, teachers, school principals and other educational staff). This will be regulated within the framework of self-evaluation and external evaluation of education institutions, as well as within the licensing system (as provided for by the measures within Objectives 4 and 5 of this Strategy).

8.4. ENHANCEMENT OF THE SYSTEM OF SELF-EVALUATION OF EDUCATION INSTITUTIONS

Self-evaluation of education institutions is a systematic and transparent process of reflecting upon one's own practice with the purpose of enhancing educational processes and promoting professional and organisational learning. The main purpose of introducing self-evaluation is to enable kindergartens, schools and student dormitories to better recognise their development needs and to take measures for the enhancement of their own practice and for the achievement of their educational goals in a more efficient and effective manner, by means of a self-analysis of their own work that is realistic and methodologically clearly defined.

Self-evaluation consists of the analytical assessment of relevant areas of the work of institutions. These areas are: the management of human and material resources; key processes (quality of teaching and student support); and results and outcomes (student achievements and the achievement of educational goals).

Self-evaluation of kindergartens and schools is a legal obligation in Croatia (Act on Education in Primary and Secondary Schools; Vocational Education and Training Act; State Pedagogical Standard of Pre-school Education, 'Official Gazette', No 63/08 and 90/10). The methodology for self-evaluation has been developed for kindergartens (NCVVO/NCEE, 2012) and for primary and secondary schools (AZOO/ETTA and Institute





for Social Research in Zagreb, 2010; NCVVO/NCEE, 2010). Within the framework of its quality assurance programmes, the Agency for Vocational Education and Training and Adult Education has also developed the methodology for self-evaluation of vocational schools (2011).

A self-evaluation approach has certainly taken hold in our kindergartens and schools. However, the following problems have been noticed in practice, which reduce the possibility of achieving the full development potential of this approach:

- Education institutions have inadequate internal capacities for the implementation of self-evaluation, for the preparation of development plans and for the implementation of development programmes.
- There is inadequate external support to institutions in the processes of self-analysis, self-evaluation and development planning.
- There is no cooperation between institutions and good practice exchange when it comes to self-evaluation and development programmes.
- There is no complementary external evaluation of institutions.

To achieve more effective self-evaluation, the following measures are proposed:

1. Strengthening the internal capacities of institutions (kindergartens, schools, student dormitories) for self-evaluation

Self-evaluation is a complex developmental approach. Institutions are expected to:

- train their staff on how to carry out critical self-analysis, how to implement a self-evaluation and how to plan organisational development;
- carry out an in-depth self-analysis based on real indicators of their own work;
- determine priority areas for development;
- define development goals, plan their achievement and plan the form of monitoring;
- prepare a structured development plan;
- implement projects for the achievement of planned goals;
- monitor the achievement of the set development goals.

This approach is demanding and most institutions lack the internal capacities for its application. The primary goal is therefore to strengthen the internal capacities of institutions for self-evaluation, which includes the training of staff and ensuring that enough time is provided for carrying out self-evaluation by including it into the number of hours of teachers' work. The key role in this process belongs to school principals who, as visionaries, promote a quality culture, evaluation and self-reflection. Besides school principals, the school team for quality is the most

important. In every institution, members of the quality team should be trained both on the use of methodological/analytical procedures and on the supervision techniques they can apply in their institution, as well as on how to become 'critical friends' of other institutions.

2. Provision of external support for the self-evaluation of schools

External support is needed for strengthening the internal capacities of schools and for fostering more effective self-evaluation. This support can be provided by licensed supervisors, qualified advisers from competent agencies or qualified independent external associates (who can also be colleagues working in other schools and who have the knowledge and experience of enhancing the quality of work in schools).

3. Regional networking and cooperation between schools

Due to the fact that there are not enough qualified experts in Croatia who could meet the needs of all schools, the Strategy proposes that the dissemination of good practice can take place through school support network or through networking of so-called 'critical friends'. The critical friends' network must be organised regionally and, besides providing support to schools, its function will be to strengthen cooperation between schools. The aim of this cooperation will be: mutual learning; the involvement of a greater number of associates; the exchange of good practice, tools and benchmarks for evaluation; the exchange of ideas and applied methods for the enhancement of work with children; teaching and learning; the launching of common initiatives, creative programmes, etc.

4. Linking self-evaluation and external evaluation of institutions' work

The self-evaluation of schools must result in a periodic report specifying the institution's development policy and containing well-structured development plans. This report will be the starting point for an external evaluation that will be periodically carried out by an external expert board. The structure of the external evaluation approach is further developed in the text.

- **MEASURE 8.4.1.** Strengthen internal capacities of institutions for self-evaluation and establish a system of external support for the self-evaluation of schools

COMPETENT BODY: AZOO/ETTA, ASOO/AVETAЕ

IMPLEMENTATION: AZOO/ETTA, ASOO/AVETAЕ, supervisors/advisers/critical friends, associations, faculties

INDICATORS: Level of internal capacities of institutions for self-evaluation. Assessment of the extent to which the structured system of continued school support is operational.

- **MEASURE 8.4.2.** Establish and coordinate regional networks of supervisors/advisers/critical friends; launch the work of the networks





COMPETENT BODY: MSES (unit responsible for education quality assurance)

IMPLEMENTATION: AZOO/ETTA branch offices, founders of education institutions, education institutions

INDICATORS: Networks established. Number of joint programmes developed. Level of participants' satisfaction

8.5. EXTERNAL EVALUATION OF EDUCATION INSTITUTIONS

The quality assurance system will link and harmonise self-evaluation and external evaluation of education institutions. External evaluation will thereby use self-evaluation and development plans of institutions as the starting point for conducting its assessment.

Systematic external evaluation of schools⁶⁵ which provides schools with valid feedback and an assessment of their work, is considered to be crucial for the continuing enhancement of the quality of learning and of the quality of planned educational outcomes in schools (OECD, 2009,⁶⁶ OECD, 2013⁶⁷).

The purpose of this approach is to re-examine the current work of institutions with the aim of fulfilling two main functions: (1) quality enhancement; and (2) the provision of responsibility for institutions' work.

The external evaluation system enables independent external identification of the advantages and achievements of education institutions, as well as areas of work that must be modified in order to enhance their functioning.

The aim of this approach is to assist education institutions in the process of their transformation into learning communities in which quality enhancement (primarily the enhancement of teaching and learning) is a continuous process. Education institutions receive feedback from external evaluators, thus assisting them in their further development and the enhancement of the quality of their work.

This approach indirectly contributes to increasing the responsibility of education institutions. Namely, it provides a transparent insight into the work of education institutions by providing objective information to institutions responsible for education quality assurance and to the public on the work and success of education institutions.

External evaluation consists of expert assessment on the relevant areas of schools' work: (1) school management; human and material resources; and key processes; (2) quality of self-evaluation and development planning; quality of teaching and student support, and quality of results and outcomes; and (3) student achievements and the fulfilment of educational goals. The assessment is based on clear and agreed criteria for the quality of schools. Moreover, in the process of longitudinal monitoring of the

work of schools, external evaluation provides data on the progress of schools with regard to different aspects of work and learning outcomes.

- **MEASURE 8.5.1.** Develop a model and procedures for external evaluation and continuous monitoring of institutions' work; prepare an ordinance and a manual for external evaluation of education institutions
COMPETENT BODY: Unit responsible for education quality assurance
IMPLEMENTATION: NCVVO/NCEE, Expert team for the development of the external evaluation model
INDICATORS: Ordinance and manual prepared for external evaluation and monitoring of institutions' work
- **MEASURE 8.5.2.** Plan and prepare a programme for the implementation of external evaluation of education institutions
COMPETENT BODY: Unit responsible for education quality assurance, NCVVO/NCEE
IMPLEMENTATION: Expert team for external evaluation
INDICATORS: Programme prepared for the implementation of external evaluation of institutions' work
- **MEASURE 8.5.3.** Provide training and licensing of external assessors (evaluators, auditors)
COMPETENT BODY: NCVVO/NCEE
IMPLEMENTATION: Expert team for external evaluation
INDICATORS: Level of preparation of external assessors (evaluators, auditors)
- **MEASURE 8.5.4.** Implement an experimental programme for external evaluation of education institutions
COMPETENT BODY: NCVVO/NCEE
IMPLEMENTATION: Expert team for external evaluation, network of evaluators
INDICATORS: Experimental programme for external evaluation of education institutions implemented. Analyses of experiences carried out. Guidelines prepared for further development of the approach.
- **MEASURE 8.5.5.** Launch a systematic programme for external evaluation of education institutions
COMPETENT BODY: NCVVO/NCEE
IMPLEMENTATION: Network of evaluators
INDICATORS: Assessment of the extent to which the programme for external evaluation of institutions is operational





8.6. EXTERNAL EVALUATION OF LEARNING OUTCOMES

External evaluation of learning outcomes is a standardised evaluation that is planned and prepared outside of schools with the aim of ensuring the consistency of all procedures: application, assessment, interpretation and comparability of results.⁶⁸

External evaluation can cover student populations, individual students or certain schools and classes only. For example, a individual school can request to monitor its students' progress or to be compared with national norms. As a method for evaluating and monitoring of education quality, it can be used at different levels:⁶⁹

- At the education system level, the evaluation of learning outcomes can be used for international comparisons, for setting and assessing national standards, for informing the public about student results, for targeting problems and for verifying the effectiveness of national education.
- At the level of school institutions, external evaluation of learning outcomes can be used for comparing student results at the school level with national standards, for internal quality assurance, for the development of institutional interventions and more effective approaches, as well as for planning changes in teaching approaches.
- At the student level, external evaluation may facilitate the monitoring of individual achievements in their relation to national norms and curricular goals and the assessment of the level of acquisition of key competences.⁷⁰ It may also be used to diagnose strengths and weaknesses of students and to monitor students' progress.

In an international context, external assessments of knowledge and skills allow for comparisons that are accepted worldwide as indicators of the quality of national education. Croatia has been participating in large-scale international assessments for several years (which are implemented nationally by the National Centre for External Evaluation of Education): PIRLS (Progress in Reading Literacy Skills Survey, 2011⁷¹), TIMSS (Trends in Mathematics and Science Skills Survey, 2011⁷²), ESLC (European Survey on Language Competences, 2011⁷³) and PISA (OECD Programme for International Student Assessment,⁷⁴ 2006; 2009; 2012). The application of international assessments of knowledge and skills provides valuable data that enable comparisons of our students' results with the results achieved by students from other countries.

The results achieved by our students at international assessments of knowledge and skills have opened important discussions on the quality of education provided in our primary schools. The results indicate the need for deeper interventions in the education system (addressed by this Strategy), which may lead to better achievements of our students in the future.

Occasional external evaluations of student achievements at the national level and the State Matura examinations that are carried out in our schools provide an insight into students' knowledge of the school subjects examined. Although the examination results allow for interesting analyses, it is questionable what these data, without any clear norms and standards of achievement, reveal about the quality of our education. In addition, the gathered data are not used for comparisons, the development of intervention programmes or the enhancement of teaching.

THE NEW APPROACH TO EXTERNAL EVALUATION OF LEARNING OUTCOMES

In order to use the external evaluation of learning outcomes more effectively for the enhancement of teaching and learning in our schools, it is necessary to develop a new approach that will enable the following: (1) systematic monitoring of the achievement of expected learning outcomes during the educational process in primary and secondary schools; (2) providing schools with applicable data on their students' results that may be used for the enhancement of work with students; and (3) verifying the quality/effectiveness of national education.

In order for this approach to be used effectively for fulfilling its primary purpose — the fostering of quality teaching and learning — it is important to develop a comprehensive and coherent model for external evaluation of learning outcomes. The model should take into account the following principles:

- External evaluation of learning outcomes must be aligned with the system of evaluation, assessment and reporting as part of the curricular system.
- External evaluation must not dominate educational practice, nor should it be the main purpose of education.
- External evaluation must promote the validation and evaluation of the core competences.⁷⁵
- By focusing on key learning outcomes, it must provide clear information about what is important to learn.
- It must be closely linked to formative assessment, which is an integral part of teachers' work in schools. It must also integrate the formative and summative purposes of evaluation and ensure their balance.⁷⁶
- It must support equal evaluation and assessment criteria in all schools.
- It must ensure inclusive evaluation adapted to the needs of different students.
- Within the framework for developing the approach, innovative evaluation procedures must be developed in different education sectors.
- In order to develop sophisticated instruments for evaluation (as well as for applying external evaluation itself), the potential of information and communication technologies must be used.





- Within the framework of the approach, teachers must be strengthened as the main stakeholders in the process of monitoring and evaluation of learning. Teachers must be encouraged and provided with assistance when it comes to developing their knowledge and skills in the area of evaluation of learning.
- The results of external evaluation must be used for self-evaluation, for the enhancement of the school practice and for the achievement of better student results. Results of external evaluation are an important element of assessment in the process of external evaluation of schools.
- Reporting on the results of external evaluation must be regular and transparent.
- The results of external evaluation must be used for reaching important decisions about how to enhance the quality of the education system at the school and system levels.

This new approach presumes the following activities: the greater use of ICT in examination procedures; the alignment of external examinations with new curricula and the procedures for assessment and evaluation in schools; the setting of standards based on clearly defined learning outcomes; a greater emphasis on the formative function of external evaluation; and the provision of direct feedback to teachers and schools on their students' achievements.

This Strategy plans to introduce periodic testing in primary and secondary schools that can be used by teachers for the monitoring of their students' progress and success when compared to national norms. The whole framework for external evaluation of learning outcomes will be harmonised with the development of a system of evaluation, assessment and reporting on the level of acquisition of educational outcomes. This process is already developed within the planned curricular changes (see Strategy objective 1.5).

Following the changes in the curriculum for secondary schools, it will be necessary to reconceptualise the State Matura model by aligning it with the programmes of schools and curricular goals. Another task will be to develop the system of external final examinations in the formal vocational education and training system that will serve the purpose of certifying or guaranteeing the successful acquisition of qualifications (as defined in the Croatian Qualifications Framework).

- **MEASURE 8.6.1.** Draft, discuss and establish a comprehensive framework for external evaluation of learning outcomes in different types of education and at different levels of education

COMPETENT BODY: MSES

IMPLEMENTATION: Unit responsible for education quality assurance; NCVVO/NCEE; Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as part of

the comprehensive curricular reform

INDICATORS: Conceptual and implementation framework designed for external evaluation of learning outcomes

- **MEASURE 8.6.2.** Define bodies responsible for the management and application of the framework for external evaluation
COMPETENT BODY: MSES
IMPLEMENTATION: Unit responsible for education quality assurance; NCVVO/NCEE; CARNET; Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as part of the comprehensive curricular reform
INDICATORS: Competent bodies defined. Level of coordination of management and application of external evaluation.
- **MEASURE 8.6.3.** Develop a model for using the results of periodic external examinations to monitor the achievement of educational outcomes at the national level (in line with Strategic objective 2.5)
COMPETENT BODY: MSES
IMPLEMENTATION: Unit responsible for education quality assurance; NCVVO/NCEE; Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as part of the comprehensive curricular reform; expert groups for the preparation of tasks and tests
INDICATORS: Model adopted for using the results of periodic external examinations. Assessment of the extent to which the system of periodic external examinations in primary and secondary schools is operational.
- **MEASURE 8.6.4.** Reconceptualise the State Matura model in compliance with new curricular goals
COMPETENT BODY: MSES
IMPLEMENTATION: Unit responsible for education quality assurance; NCVVO/NCEE; Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as part of the comprehensive curricular reform; expert groups for the preparation of tasks and tests
INDICATORS: New State Matura model re-examined and adopted
- **MEASURE 8.6.5.** Establish a model for external evaluation and certification of vocational qualifications in the formal vocational education and training system
COMPETENT BODY: MSES
IMPLEMENTATION: National Council for the Development of Human Potential, NCVVO/NCEE, ASOO/AVETAE
INDICATORS: Establishment of a system of external verification and certification of vocational qualifications in the formal vocational education and training system. Level of alignment with curricular documents. Level of alignment with the Croatian Qualifications Framework.





8.7. ESTABLISHMENT OF A DIGITAL SYSTEM FOR EVALUATING AND MONITORING THE ACHIEVEMENT OF LEARNING OUTCOMES

The use of modern technology enables a much higher-quality and more economical implementation of different forms of external evaluation of learning outcomes. The development of an 'e-assessment' system would enable a more flexible and efficient implementation and monitoring of the achievement of learning outcomes, as one of the main indicators of the quality of education. The success of the educational process can thus be monitored at different levels of the education system. The e-assessment system would be applied through the use of advanced technologies, it would be aligned with curricular standards and it would enable the continuous and systematic monitoring of the level of students' acquisition of knowledge and competences. Thanks to systematic monitoring, as well as better and more comprehensive feedback, a good insight could be obtained into the strengths and weaknesses of the learning process and of the education system in general. The assessment would be aligned with the curricular framework, as well as with strictly formative procedures (developed within this framework) for assessing and evaluating students' progress. This will enable the development of an integrated approach to formative and summative assessment. Such an approach will make it possible for teachers and schools to monitor their students' development and progress in a relatively easy manner. On the basis of the results, teachers and schools could then adapt educational activities to the needs, abilities, knowledge, interests and motivation of their students.

- **MEASURE 8.7.1.** Develop and establish an ICT system for the digital evaluation of learning outcomes

COMPETENT BODY: MSES

IMPLEMENTATION: NCVVO/NCEE, CARNET

INDICATORS: Level of operation of the system for digital evaluation of learning outcomes. Level of satisfaction of users, teachers and students.



EARLY CHILDHOOD AND PRE-SCHOOL EDUCATION,
PRIMARY EDUCATION AND SECONDARY EDUCATION





HIGHER EDUCATION

The ability to review, analyse, address and solve the most complex issues requires competences acquired through tertiary education. This means higher education is a major driving force of all social changes. The aim of this Strategy is to raise the overall quality of higher education in order to ensure that students acquire competences for creative professional work and active participation in a democratic society, as well as to ensure that higher education has a positive influence on society as a whole, encourages economic development and fulfil personal needs. It is essential to make higher education accessible to all on the basis of individual ability. Public higher education institutions are institutions of special public interest in Croatia. The state should therefore assume transparent responsibility for the organisation and operation of the Croatian Higher Education Area.

The goals defined by this Strategy are in line with EU goals defined in Europe 2020,⁷⁷ as well as in other strategic initiatives resulting from it, e.g. Education and Training 2020,⁷⁸ Rethinking Education,⁷⁹ Modernising Universities,⁸⁰ and Internationalisation in European Higher Education.⁸¹ The Bologna Process for higher education reform has been implemented in order to establish a basis for a more rapid development towards achieving a knowledge society, tolerance and equal opportunities through the enhancement of higher education. The Bologna Process is the foundation for the future development of European higher education institutions. The Croatian higher education system should be integrated into development trends in Europe, which reflect the awareness that only synergy of higher education, science, innovation and technology can lead to the global competitiveness of Europe.

The overall development of the higher education system in Croatia should lead to the increased competitiveness of students. This competitiveness relates not only to future jobs, but also to creative and innovative work/development that leads to self-employment and to launching new business and social entities. The educational process should be better adjusted to acquiring the competences required for satisfying social needs. Moreover, the education process should be organised in a manner that secures an environment that is motivating for the purposes of both teaching and learning. In order to achieve this goal, it is necessary to carry out substantial changes in the network



of higher education institutions (and its organisation), in the higher education process and in the resources available to higher education institutions. The further development of quality assurance mechanisms should ensure the effectiveness of the system and the optimal use of available resources, as well as secure new resources in line with the goals of the Europe 2020 strategy.

Achieving the goals set by this Strategy will lead to the increased competitiveness of Croatian experts in both a European and global context. This in turn will provide a basis for increasing the competitiveness of the Croatian economy in Europe and worldwide. It is therefore particularly important to encourage study programmes for jobs that are under-represented in the current system, since they are expected to directly increase employability and have a positive influence on both the economy and society as a whole in Croatia. However, it is not sufficient for new study programmes to merely satisfy existing needs — such programmes should be introduced based on national development projections. They should be organised both as full-time studies and lifelong learning programmes in order to provide the basis for diversified economic development. In this context it should be stressed that higher education has a role in developing high-quality human resources for the entire science and education system. ‘Teaching the teachers’ is fundamental to the quality of the overall education system, and hence to the functioning of all segments of society as a whole.

The goals defined by this Strategy will lead to the overall accessibility of higher education. This will result in greater social equity, in a wider pool for hiring future experts and in an increased proportion of the population with a higher education degree, which directly influences the overall quality of social relations. In line with trends in other EU countries, Croatia should reach a share of 35 per cent of the population in the 30-40 age group with a tertiary education degree by 2020.⁸² The substantial increase in the number of higher education students in the last ten years makes this goal realistic. However, aligning the quality of the higher education system with European standards is a demanding task that should bring together all institutions and individuals — not only those belonging to the system, but also all individuals that the system relies on in any way. A priority for developing higher education system is to expand the capacity of STEM fields. Besides, it is necessary to increase the system’s efficiency in terms of shortening the period of study and increasing graduation rate. These goals can be achieved only by joint efforts and initiatives at all levels leading to positive shifts in the higher education system, consequently leading to positive trends in Croatian society.

OBJECTIVE 1: IMPROVE STUDY PROGRAMMES BY CONSISTENTLY IMPLEMENTING THE PRINCIPLES OF THE BOLOGNA REFORM AND BY RE-DEFINING ACQUIRED COMPETENCES

The introduction of the principles of the Bologna Process⁸³ into the Croatian Higher Education Area resulted in an important change in both the number and types of programmes provided by higher education institutions. Higher education institutions tried to identify new and contemporary programmes that could meet the demand for new types of jobs. However, some programmes were simply multiplied while other programmes were partially revised, even though they no longer addressed relevant social needs. Higher education institutions took various approaches to reforming study programmes: some saw the implementation of the Bologna reform as an opportunity for a positive shift in the quality and content of their study programmes, while others kept the existing programmes and ‘moulded’ them into a new form of study. Following the introduction of new programmes, the majority of higher education institutions failed to conduct a formal analysis of the results arising from those changes or to make any modifications to their implementation based on such analyses. The Bologna reform was predominantly understood as a one-off measure and not as a long-term process of reforming study programmes. It is therefore necessary to monitor the process continuously in order to implement the required modifications. Study programmes should be adjusted constantly to requirements of high-quality education in line with changes in the wider social context.

Special attention should be paid to modernising study programmes for teacher competences, since they have a significant and direct impact on the quality of primary and secondary education, as well as an indirect impact on all levels of education. In addition, there is also a need to modernise programmes for lifelong learning of civil servants.

All universities in Croatia should develop their research activity and ensure that research is properly integrated into the education process as one of the main prerequisites for delivering university study programmes. On the other hand, study programmes in the arts (and in the art academies that implement them) should be developed based on the specifics of the arts, with the role of arts in those study programmes being equal to the role of research in the implementation of university study programmes.

1.1. ALIGNING THE NUMBER AND PROFILE OF STUDY PROGRAMMES WITH THE SOCIAL AND ECONOMIC NEEDS

According to data from the Agency for Science and Higher Education, there are currently 1 350 study programmes (1 133 university study programmes and 217 professional study programmes). In the last eight years,





the number of study programmes has increased more than threefold. This is partly a result of the splitting-up of already existing programmes into separate Bachelor and Master programmes (in line with the Bologna system), as well as due to the establishment of new higher education institutions. Study programmes provided by universities are predominantly in the social sciences (302) and the humanities (239), followed by technical sciences (178), the arts (139), biomedicine and health (108) and natural sciences (89). In addition, there are 39 interdisciplinary study programmes. Polytechnics and schools of professional higher education predominantly carry out programmes in the social sciences (67) and technical sciences (51), followed by biomedicine and health (15), biotechnical sciences (13), the arts (13) and one interdisciplinary programme.⁸⁴

This analysis shows the prevalence of programmes in the social sciences and the humanities (with the latter at universities only), as well as the prevalence of university study programmes (89 per cent) in comparison to programmes of polytechnics and schools of professional higher education.

Data from the Croatian Bureau of Statistics show that there were 152 857 students in the winter semester of the academic year 2012/2013. Among the total number of students, 118 976 (78 per cent) studied at universities and 33 889 (22 per cent) studied at polytechnics and schools of professional higher education.⁸⁵ The average number of enrolled students per programme was 113, with the average in university study programmes being 100, while the average at polytechnics and schools of professional higher education was 217. At universities there were 7 640 full-time equivalent (FTE) teaching staff, while at polytechnics and schools of professional higher education there were 860 FTE teaching staff. The average number of full-time teaching staff per study programme is therefore 6.4 at universities and 5.5 at polytechnics and schools of professional higher education.

These data clearly show that the number of study programmes is too large, which necessarily leads to an inefficient use of resources, especially at universities. There are many examples of similar or almost identical programmes being provided at different higher education institutions and, in the majority of cases, there is no real justification for the multiplication of such programmes. A detailed analysis of existing study programmes must therefore be prepared, based on the learning outcomes and competences that need to be acquired through those programmes. Based on this, the number of study programmes can be decreased, using funding agreements with higher education institutions (which are referred to as 'programme agreements' in Croatia) as one of the main instruments, as well as through negotiations among higher education institutions on cooperation and implementation of joint study programmes. In addition, quality assurance mechanisms will be used and support will be provided for the networking of higher education institutions for developing joint study programmes. Similar recommendations were made in the document entitled Network of Higher Education Institutions and Study

Programmes in the Republic of Croatia,⁸⁶ which defined the baseline for rationalising the higher education institutions' network with the aim of increased efficiency of the national higher education system. Increased efficiency implies shortening the duration of study, increasing graduation rates, decreasing enrolment quotas for study programmes producing graduates in occupations that have low employment prospects, increasing enrolment quotas for study programmes that are in high demand on the labour market, providing employment to graduates with Bachelor degrees and increasing the quality of higher education in all fields.

- **MEASURE 1.1.1.** Analyse study programmes to examine their contents and to assess the level of alignment between acquired learning outcomes/competences and social needs. Use the analysis to rationalise the number of study programmes and define enrolment quotas, based on instruments of the Croatian Qualifications Framework. Encourage higher education institutions to develop standards of qualifications. Use the analysis to adopt and implement a plan for decreasing the number of study programmes. Use sectoral councils and the Croatian Employment Service as bodies that propose enrolment quotas in the phase of concluding programme agreements.

COMPETENT BODY: National Council for Science and Higher Education

IMPLEMENTATION: Working group for analysing study programmes, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education

INDICATORS: Analysis conducted based on qualifications, procedures and standards of the Croatian Qualification Framework. Plan adopted for decreasing the number of study programmes. Extent to which the analysis results match the current system. Level of alignment of programmes with real social needs. Number of accredited study programmes.

1.2. MODIFYING CONTENTS OF STUDY PROGRAMMES WITH CLEARLY DEFINED LEARNING OUTCOMES

At the time when the new study programmes aligned with the Bologna reform were introduced, there were no defined outcome benchmarks such as learning outcomes and student competences. Activities related to the Croatian Qualifications Framework had not yet begun. With a few exceptions, new study programmes were developed within higher education institutions with no particular consultation with other stakeholders such as employers, relevant line ministries, etc. This resulted in a striking inconsistency between the quality of various programmes, their acceptance by the labour market and their general contribution to society.

In the meantime the legislative framework for quality assurance in higher education has been adopted and the Croatian Qualifications Framework





Act has come into force (OJ no. 22/13).⁸⁷ These acts defined instruments for harmonising the level of quality of study programmes, which means there is now a need to revise the structure and learning outcomes of existing study programmes, as well as the way they are delivered. Study programmes should ensure that students acquire prescribed learning outcomes, but they should also remain flexible enough to adapt to constant and rapid changes in the wider social context. Moreover, there is a need to develop an efficient manner of assessing the acquisition of those learning outcomes. Some higher education institutions have still not shifted from knowledge transfer (as a result of the higher education process) to competence development, which means that learning outcomes are still validated based on testing content memorised by students, instead of testing their acquired knowledge and skills and assessing their competences.

Study programmes still lack a methodology for developing transversal competences such as communication and presentation skills, management skills or entrepreneurship. The existing proportion of practical classes is still insufficient, while some study programmes lack work placements and field work altogether. In many study programmes, high-quality work placements are a prerequisite for acquiring competences and consequently a prerequisite of better employability of graduates, in terms of their better preparation for the requirements of their future employers. Consequently, it is necessary to develop appropriate organisational models for this practice-oriented part of study programmes, within the framework of sector interest networks (see measure 4.2.4). Special focus should be placed on the need for students to develop creativity and innovation through their studies. A large proportion of student workload at universities has been shifted to undergraduate study, and the real workload of graduate students often does not correspond to the number of acquired ECTS credits. Therefore, new learning outcomes should be introduced and the existing learning outcomes (and/or ECTS credits) should be revised so that courses/modules at the graduate study level result in more complex learning outcomes than those at undergraduate studies.⁸⁸ Adequate distribution of content should be used for identifying learning outcomes at undergraduate studies, in a manner that increases employability of holders of a Bachelor degree.

Each study programme should include clear learning outcomes that can be easily assessed. They should result from a hierarchy of learning outcomes, starting from the level of the study programme through to the level of individual courses/modules.⁸⁹ The methodology for assessing learning outcomes should guarantee that they have indeed been acquired and the learning outcomes should also be confirmed within a relevant qualification. If entered into the Register of the Croatian Qualifications Framework, the qualification can be referenced to the European Qualifications Framework.⁹⁰

outcomes is indeed adopted in Croatian higher education (besides, to a certain extent, the indicator of students' employability). The impression, however, is that these procedures are not followed in the majority of cases. Therefore, prescribed learning outcomes should be aligned with relevant competences. To this end, it is crucial that higher education institutions cooperate with employers, since their participation during the development of qualifications standards and study programmes can substantially contribute to the relevance of the prescribed learning outcomes. Establishing such relations will lead to the additional rationalisation of the higher education system by abolishing outdated competences that are no longer needed and by modifying programmes so that students acquire up-to-date competences that are in demand.

It is especially necessary to encourage innovative approaches to delivering study programmes and to applying high-tech teaching aids through the substantial use of information and communication technologies. In this respect, it is necessary to introduce e-learning as an complementary form of teaching (i.e. as a mixed, hybrid approach).⁹⁰ In addition, university libraries should establish centres for supporting students with their final/ diploma theses and dissertations. Libraries should be more involved in the acquisition of transversal competences.

- **MEASURE 1.2.1.** Revise contents and learning outcomes of study programmes. Use the Croatian Qualifications Framework to align learning outcomes with competences. Include employers in the revision of contents of study programmes through the sector councils, the Croatian Employers' Association and the Croatian Chamber of Commerce. Shift the focus of study programmes from undergraduate to graduate studies and, at the same time, align real student workload with ECTS credits referring to each course/module. Ensure student work placements in the framework of all study programmes in which they can contribute to acquiring competences. Incorporate more transversal competences into undergraduate and graduate studies.

COMPETENT BODY: National Council for Science and Higher Education

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions, Agency for Science and Higher Education

INDICATORS: Number of new/revised study programmes approved. Level of alignment of learning outcomes with competences. Level of employers' representation. Percentage of students participating in work placements. Share of transversal competences incorporated into study programmes.

- **MEASURE 1.2.2.** Introduce a system for encouraging innovative approaches to delivering study programmes, including use of information and communication technologies. Develop a system for supporting teaching projects through an annual call for pro-





posals intended for co- financing new, creative and more efficient approaches to teaching at higher education institutions

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions, University Computing Centre (SRCE)

INDICATOR: Assessment of the extent to which the teaching projects system is operational

- **MEASURE 1.2.3.** Develop and introduce a mentoring system at all higher education institutions. Train teaching- and non-teaching staff to develop mentoring competences through internal procedures at higher education institutions. Include as many teaching- and non-teaching staff as possible in the mentoring system and provide regular student advising. Introduce the assessment of mentors into student surveys.

COMPETENT BODY: National Council for Science and Higher Education

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Relevant regulations adopted by higher education institutions. Level of operation of the mentoring system. Percentage of teaching staff participating in training.

Percentage of teaching staff and students in the mentoring system. Level of satisfaction of teaching staff and students.

- **MEASURE 1.2.4.** Determine the methodology for verifying and validating learning outcomes and acquired competences, then ensure that they are aligned with one another. This measure should be implemented for learning outcomes at the level of study programmes.

COMPETENT BODY: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education

IMPLEMENTATION: Higher education institutions, Croatian Employers' Association, Croatian Chamber of Commerce, Agency for Science and Higher Education, relevant working group

INDICATOR: Level of alignment of learning outcomes with competences (which are themselves in line with the Croatian Qualifications Framework)

- **MJERA 1.2.5.** Revise the methodology for assessing learning outcomes in order to determine their acquisition more reliably. This measure relates to assessing learning outcomes at the course/module level. It will be necessary to determine the principles for implementing, validating and documenting the assessment of learning outcomes. It will also be necessary to organise training of teaching staff at higher education institutions on this form of assessment.

COMPETENT BODY: Rectors' Conference, Council of Polytechnics

and Schools of Professional Higher Education

IMPLEMENTATION: Higher education institutions

INDICATORS: Relevant regulations adopted on the methodology for assessing learning outcomes. Level of implementation of the prescribed methodology. Percentage of teaching staff participating in training. Level of teaching staff satisfaction.

- **MEASURE 1.2.6.** Encourage graduation within a prescribed time-frame, while ensuring both the quality and accessibility of studies, as well as the acquisition of relevant learning outcomes. This measure should be also included into the objectives set by programme agreements.

COMPETENT BODY: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education

IMPLEMENTATION: Higher education institutions

INDICATORS: Average duration of time to graduation. Level of quality and accessibility. Level of acquisition of learning outcomes.

- **MEASURE 1.2.7.** Establish appropriate infrastructure and organisational capacities of centres to support students preparing their final theses and dissertations

COMPETENT BODY: MSES

IMPLEMENTATION: Croatian Academic and Research Network (CARNET), University Computing Centre (SRCE), National University Library, university libraries

INDICATORS: Assessment of the extent to which the counselling system is operational (with relevant technical support services at libraries). Web portal established containing documents on scientific integrity, quoting, plagiarism etc.

OBJECTIVE 2: ESTABLISH AN EFFICIENT BINARY HIGHER EDUCATION SYSTEM THAT IS ALIGNED WITH NATIONAL NEEDS AND WITH THE PRINCIPLE OF EFFICIENT MANAGEMENT OF HIGHER EDUCATION INSTITUTIONS

Both in Europe and beyond, there exist binary and unitary higher education systems, as well as diversified ones. In the last two decades, some European countries have dropped the binary system while other countries have introduced it. Croatia has a long tradition of having a binary system, with only a short formal discontinuity between 1981 and 1993. Croatia's binary system is characterised by the fact that higher education institutions deliver university studies or professional studies.⁹²

The geographical distribution of the existing network of higher education institutions in Croatia encompasses all regions of the country. However,





the number of institutions exceeds the national potential and available resources. In Croatia, there are currently ten universities (seven public and three private), 15 polytechnics (11 public and four private) and 31 schools of professional higher education (28 private and three public). Due to a relatively small higher education market and a low level of in-country student mobility, new study programmes were often introduced throughout the country, leading to an unjustified boom in the number of higher education institutions, as well as to a lack of quality. For this reason, the long-term sustainability of certain regional institutions with no critical mass for ensuring high-quality teaching or research is open to question.

At the national level, this situation has resulted in high enrolment quotas that are not sustainable. Compared to the number of students who complete secondary education (only those programmes that enable access to higher education), the number of available enrolment places at higher education institutions is higher (110 per cent in public higher education and as high as 123.4 per cent in both public and private higher education). In the EU, the average number of students enrolled in higher education institutions is 84 per cent of the number of secondary school graduates. In addition to this challenge, demographic forecasts for Croatia predict a decrease in the number of secondary school graduates.⁹³

At the same time, from the viewpoint of the binary system, the structure of the student population by types and fields of study in Croatia is completely opposite to the structure in other EU Member States:

- 77 per cent of all students are enrolled at universities, while only 23 per cent are enrolled at polytechnics and schools of professional higher education;
- 39 per cent of students of professional study programmes are enrolled at universities;
- 46 per cent of the total number of students enrolled at polytechnics are enrolled in professional study programmes within the field of social sciences (most notably in the field of economics and business);
- 72 per cent of students enrolled at schools of professional of higher education are enrolled in professional study programmes within the field of social sciences (most notably in the field of economics and business).⁹⁴

Moreover, the labour market in Croatia still does not make a clear distinction between university and professional Bachelor degrees (which have been issued since the introduction of the Bologna Process). The differences in learning outcomes between a professional and university Bachelor degree are not clear. When announcing a call for applications for a job vacancy, there is no obligation to make a clear distinction between qualifications earned after the completion of a university or professional study programme, or between a Bachelor and Master's degree. This is also the case in the state administration and in public companies.

Taking such facts into consideration, there is a need to re-define the concept of the binary system, which should be aligned with national needs and should become more efficient by improving its management. At the same time, universities should provide different types of study programmes to those provided out by polytechnics and schools of professional higher education — although there should be no assumption that the quality of teaching at polytechnics is any lower. Employers should be informed of the existing types of qualifications and their respective learning outcomes.

2.1. INCREASING MANAGEMENT EFFICIENCY AT HIGHER EDUCATION INSTITUTIONS

Until the introduction of pilot programme agreements, the majority of higher education institutions in Croatia lacked a clear vision and respective objectives, which made it difficult to assess their management. On the other hand, there was also a lack of a clear national strategy, which made it harder to define such an objective. The ministry in charge of education has also lacked high-quality tools for testing the efficiency of the entire system, most notably its funding.

At universities that are composed of faculties (which registered as legal entities), the authority of the university rector overlaps with authority of deans, i.e. there is no clear hierarchy of decision-making, while indirect interests of faculties in some cases do not match the interests of the university. This represents an obstacle to efficient management. Some problems related to managing universities will be resolved by introducing full-scale programme agreements. In addition to defining clear objectives for rectors and senates, full-scale programme agreements would transfer more autonomy in decision-making and more accountability related to: reaching these objectives, leading the policy of quality, clear profiling of a university in the Higher Education Area, and improving links with other higher education institutions in Europe and beyond.

In the current system, heads of higher education institutions are elected by those who will become their subordinates following the elections (teaching staff, members of teaching councils, deans and members of the senate). This makes elected heads responsible to the bodies that elected them. Experiences from various systems show that such an elective mechanism sometimes does not lead to the election of the best or most competent candidate, while the heads find themselves in situations when decision-making is ruled by compromises. In contrast, a number of successful European higher education systems use the mechanism of managing higher education institutions through management boards composed of eminent individuals in society, whose integrity and high ethical values guarantee the respect for academic principles in appointing heads, monitoring their work and evaluating the results of higher education institutions. As a rule, management board members are nom-





inated following a public call and they are neither political officials nor prominent members of political parties. This Strategy envisages the evaluation of the current system and the development of a new system for managing higher education institutions aligned with the Strategy.

In addition, heads of higher education institutions are currently elected among teaching staff, so they usually have no formal competences related to management. For this reason, it is necessary to provide a certain level of additional training related to decision-making at higher education institutions.

Making high-quality decisions requires data, and relevant data is often unavailable, insufficient, and sometimes even incorrect. This situation makes it very difficult to manage higher education institutions effectively. There is therefore a need for a unified system for managing information that is relevant to the Croatian Higher Education Area. Heads of higher education institutions have limited autonomy in developing budgets of their institutions, and salaries prevail in the structure of the budget. While they do have the autonomy to spend funds earned through own income, such sources of income are extremely low at most higher education institutions, and those who do have such revenues often need to use a proportion of them to cover their overhead expenses.

- **MEASURE 2.1.1.** Establish a system for funding higher education institutions through full-scale programme agreements
This measure is elaborated in detail under 'Objective 4: Develop an efficient higher education funding system that stimulates development' (4.1).

- **MEASURE 2.1.2.** Develop and implement an efficient model of managing higher education institutions, taking into consideration their autonomy and the principle of accountability for reaching objectives

COMPETENT BODY: National Council for Science and Higher Education

IMPLEMENTATION: MSES, Agency for Science and Higher Education, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Guidelines developed for establishing an efficient management model. Legal acts of higher education institutions amended. Level of model's operation and efficiency.

- **MEASURE 2.1.3.** Determine a clear relation between rights and obligations of universities and their constituent units registered as legal entities. Amend statutes and regulations of higher education institutions.

COMPETENT BODY: MSES

IMPLEMENTATION: National Council for Science and Higher Education, Rectors' Conference, higher education institutions

INDICATORS: Statutes of universities and their constituent units

(legal entities) amended, in terms of clear definition of their authority and accountability related to management. Percentage of universities and their constituent units with a clear relation of their rights and obligations.

- **MEASURE 2.1.4.** Introduce a system for additional training for heads of higher education institutions. The additional training should be carried out as a programme in the field of system management for heads elected for the academic year 2016/2017 and beyond.

COMPETENT BODY: National Council for Science and Higher Education

IMPLEMENTATION: Higher education institutions with relevant experts, Agency for Science and Higher Education

INDICATOR: Percentage of heads with additional training completed (all heads should complete it until 2020)

- **MEASURE 2.1.5.** Establish a unified system for managing information that is relevant to the Croatian Higher Education Area *This measure has been elaborated in detail under 'Objective 5: Secure appropriate premises and information and communication technologies infrastructure for higher education institutions' (5.2).*

2.2. DISTINGUISHING BETWEEN UNIVERSITY AND PROFESSIONAL STUDY PROGRAMMES BASED ON TRANSPARENT AND VERIFIED COMPETENCES

The attractiveness and competitiveness of study programmes should be increased, in particular in fields relevant for economy development (STEM).⁹⁵ Various activities should be focused on including as many interested participants as possible, e.g. setting up tax reliefs/incentives and allocating additional funding incentives for higher education institutions and for their students. Developing new professional study programmes should be planned in line with the practice of developed European countries, according to the development forecast of Croatia.

One difference between university and professional study programmes is that the contents of a professional study programme are predominantly profession-oriented, aimed at acquiring skills — although there are some contents aimed at acquiring (theoretical) knowledge. In contrast, contents of university study programmes are predominantly oriented towards acquiring (theoretical) knowledge, although there are some contents aimed at acquiring skills. In the framework of this concept, professional study programmes should be more flexible in order to promptly meet short-term demands of the market, while university study programmes should secure better foundations and fundamental knowledge more appropriate to changing demands by the market, technology and society. Both types of study, however, should equally prepare students for lifelong





learning. As a rule, university study programmes should be delivered by universities, while professional study programmes should be delivered by polytechnics and schools of professional higher education. There are some exceptions, however: a university can deliver professional study programmes if there is an explicit social demand for programmes that are not available at either polytechnics nor schools of professional higher education, or in the case of insufficient capacity of those polytechnics or schools of professional higher education that provide them. Another exception is that some study programmes are jointly delivered by a university and a polytechnic or a school of professional higher education.

The level of quality of professional study programmes should be upgraded and aligned with the level of quality of university studies in the respective field, by incremental alignment of minimal criteria with international standardised criteria for accreditation of university and professional studies. The difference between professional and university studies should not be in quality but in learning outcomes, which should be clearly defined and should then be validated, verified and regularly revised.

Quality assurance mechanisms should be a fundamental lever for the development and restructuring of the binary system. Quality assurance objectives should be closely linked to the achieved level of quality related to each guideline defined in the 'Ordinance regulating the content of letters of accreditation and the requirements for obtaining a letter of accreditation (for becoming a higher education provider), and regulating the re-accreditation of higher education institutions'. The Ordinance is also in line with the Standards and Guidelines for Quality Assurance in the European Higher Education Area at higher education institutions.⁹⁶ This is the area of operation of the Agency for Science and Higher Education of the Republic of Croatia, which has international accreditation and significant experience in the procedure for evaluating the quality assurance system.⁹⁷

- **MEASURE 2.2.1.** Make learning outcomes the basis for differentiating between professional and university study programmes

COMPETENT BODY: MSES

IMPLEMENTATION: National Council for Science and Higher Education, Rectors' Conference, higher education institutions, working group for drafting legislation

INDICATORS: Standards of qualifications developed with a clear distinction between university and professional study programmes

- **MEASURE 2.2.2.** Align minimal national criteria for obtaining a letter of accreditation with international standardised practice related to resources required for the operation of higher education institutions

COMPETENT BODY: MSES

IMPLEMENTATION: Agency for Science and Higher Education, Rectors' Conference, Council of Polytechnics and Schools of Profes-

sional Higher Education

INDICATORS: Criteria adopted and included into relevant legislation

- **MEASURE 2.2.3.** Align the minimal quality criteria that higher education institutions need to satisfy for delivering professional and/or university study programmes

COMPETENT BODY: MSES

IMPLEMENTATION: Agency for Science and Higher Education, the Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education

INDICATORS: Criteria adopted and included in relevant legislation

2.3. TARGET PUBLIC FUNDING OF HIGHER EDUCATION AT QUALIFICATIONS THAT ARE NEEDED FOR THE LONG-TERM SUSTAINABLE DEVELOPMENT OF THE CROATIAN ECONOMY AND SOCIETY

A detailed analysis will need to be made of the real needs and possibilities of all stakeholders (secondary school students, the labour market and the higher education system) and enrolment quotas will be re-defined. In parallel, the quality of delivery of study programmes will be raised, which will result in increased efficiency (i.e. progression). When re-defining quotas, attention will be paid to real social needs, but also to quality assurance elements for each higher education institution. Although the current situation on the labour market presents an important parameter that should be taken into consideration when assessing real social needs, it is certainly not the only relevant parameter. The methodology for identifying quotas should consider the wider social role of higher education, forecasts of the country's development prospects, the current state of affairs, and other parameters that could affect an accurate assessment of social needs. At the same time, elements of existing methodologies from developed European countries could also be adopted, while respecting the specificities of Croatia. Special attention should be paid again to STEM areas, since analyses conducted in Croatia and abroad show that they are under-represented.⁹⁸

- **MEASURE 2.3.1.** Develop a methodology for forecasting social needs by defining the competences for future occupations and defining quotas per fields and study programmes for all three levels of higher education. Define a fixed part of a quota and a flexible part, taking into consideration development forecasts and fluctuations in the labour market. Monitor variations in the labour market and align quotas continuously.

COMPETENT BODY: National Council for the Development of Human Potential

IMPLEMENTATION: Public institutes and higher education institutions with relevant expertise, Croatian Employment Service, government agencies with relevant expertise

INDICATORS: Assessment of the extent to which the forecast model



is operational. Percentage of forecast matching actual state of affairs.

2.4. ASSIGNING TEACHING DUTIES BASED ON ALIGNING THE COMPETENCES OF TEACHING STAFF WITH CONTENTS OF TEACHING



HIGHER
EDUCATION

The selection of teaching staff and the assignment of teaching duties will be linked to types of contents instead of types of study. As mentioned previously, professional study programmes are predominantly profession-oriented and primarily aimed at acquiring skills (although they may also include contents primarily oriented to acquiring knowledge). On the other hand, the curriculum of university study programmes are primarily oriented towards acquiring knowledge (although some parts of a curriculum are oriented towards acquiring skills). It results that the type of study is irrelevant for teaching staff and that the only fact that matters is a type of contents (profile of a unit of learning outcomes) taught by teaching staff, and that they should have adequate competences for those contents. There should therefore be a balance of teaching excellence and of the role of teaching staff's research or professional work when assigning teaching duties. Consequently, the majority of courses/modules in professional study programmes should be assigned to teaching staff elected into teaching grades, while the majority of courses/modules in university study programmes should only be taught by teaching staff elected into research-teaching grades. Bodies and institutions in charge of quality assurance of higher education institutions shall guarantee that this principle be respected at the time of initial accreditation and re-accreditation.

- **MEASURE 2.4.1.** Define a system for assigning teaching duties based on contents and not on type of study. Teaching staff should have adequate teaching competences for implementing respective contents, regardless of the type of study.

COMPETENT BODY: MSES

IMPLEMENTATION: National Council for Science and Higher Education, working group for drafting legislation, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education

INDICATORS: Amendments of relevant legislation.

2.5. APPLYING PREVIOUSLY ACHIEVED COMPETENCES AS THE ONLY CRITERIA FOR VERTICAL STUDENT MOBILITY

At present vertical mobility is mainly based on administrative and formal restrictions and requirements. This should be replaced by identifying students' motivation and excellence, including relevant testing and assessment of required income competences.

- **MEASURE 2.5.1.** Develop a system and methodology for recognition of prior learning, or assessment and testing of existing competences, as a basis for vertical mobility
COMPETENT BODY: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education
IMPLEMENTATION: MSES, Agency for Science and Higher Education, higher education institutions
INDICATORS: Regulations developed on recognition of competences acquired through prior learning, and testing existing competences for graduate studies. Assessment of the extent to which the system is operational. Level of satisfaction of included stakeholders.

2.6. ENHANCING INSTITUTIONAL NETWORKING IN ORDER TO INCREASE EFFICIENCY OF HUMAN AND MATERIAL RESOURCES

Cooperation and networking of higher education institutions will be encouraged in order to increase efficiency of their human and material resources. Cooperation between higher education institutions related to delivering (joint) study programmes will decrease the existing surplus of programmes. Merging resources will also increase the quality of teaching. On the other hand, there is a need to enhance cooperation between higher education institutions and other stakeholders, in particular employers of future graduates. This would ensure adequate stakeholders' participation in teaching, partly by transferring practical experience to students through formal classes, and partly by student work placements. It should be noted that these individuals are usually not teaching staff so they cannot be formal holders of courses/modules, but their experience may significantly enrich and improve the quality of teaching.

- **MEASURE 2.6.1.** Establish a data register on the resources of higher education institutions that are relevant for delivering study programmes (e.g. human and material resources). Integrate the register with the central information system of higher education institutions.

This measure has been elaborated in detail under 'Objective 5: Secure appropriate premises and information and communication technologies infrastructure for higher education institutions' (5.2).

- **MEASURE 2.6.2.** Establish mechanisms for encouraging the cooperation and networking of higher education institutions related to full or partial implementation of joint study programmes
COMPETENT BODY: MSES
IMPLEMENTATION: National Council for Science and Higher Education, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education
INDICATORS: Number of joint national and international study programmes





2.7. ENABLING LINKS OF LABOUR MARKET WITH HIGHER EDUCATION

A system of professional student guidance⁹⁹ will be established in cooperation with the business sector, entrepreneurs, the Employment Service and other relevant institutions. It will aimed at identifying students' aspirations and subsequently guiding them during their studies in accordance with the competences that they have developed. The system will be coordinated with the system of professional guidance in secondary and adult education, and universities and polytechnics will establish their own centres for student support and professional guidance.

- **MEASURE 2.7.1.** Establish the necessary infrastructure and organisational capacities for student support and professional guidance centres

COMPETENT BODY: MSES

IMPLEMENTATION: National Council for Science and Higher Education, National Council for Development of Human Resources, higher education institutions, Croatian Employers' Association, Croatian Chamber of Commerce

INDICATORS: Amendments made to relevant legislation. Assessment of the extent to which the professional guidance system and relevant services are operational. Level of users' satisfaction.

2.8. RE-DEFINING THE MODEL OF PART-TIME STUDIES

Croatia has a long-standing tradition of part-time studies. A review has shown that the majority of part-time studies are in the social sciences.¹⁰⁰ The main rationale for providing part-time studies is to balance certain students' need for additional knowledge and competences with their work- and family-related obligations. Studying part-time requires a special schedule and alternative types of provision, thus enabling the extension of the duration of studies. Syllabi of part-time studies therefore differ from those of full-time studies. However, learning outcomes and competences should be the same as those acquired through full-time studies.

Although it was not their original intention, today part-time studies have become a manner for increasing enrolment quotas and admitting students who could not obtain access to full-time studies. Part-time studies therefore represent an additional source of income of higher education institutions for covering their operational costs.

In the future, part-time studies will be developed as a part of the lifelong learning system and will be aimed at candidates who are either employed or have other reasons for choosing a different pace of study. Part-time studies will belong to the adult education system. Their contents and learning outcomes will not differ from full-time studies, but the difference will lie in a more flexible pace for enrolling in different courses/

modules, based on students' (non-study related) obligations. A system of recognition of prior competences should also be developed, in line with other systems for validation and recognition of prior learning. In the same way as full-time studies, part-time studies will be funded through programme agreements.

Programmes in the STEM fields will be encouraged (stimulated by increased enrolment quotas, through programme agreements, etc.), which will produce experts capable of coping with the demands of the contemporary economic and public sector. A special scholarship programme will also be developed for students enrolled in study programmes for shortage occupations.

Additional support (funding) mechanisms related to professional development and training will be developed in cooperation with employers. Such support will enable an increase in the number of students completing part-time studies, while at the same time enhancing competences related to their occupation.

- **MEASURE 2.8.1.** Regulate part-time studies by amending relevant legislation to define key elements for the successful implementation of part-time studies, in particular:
 - initial accreditation;
 - validating the level of prior learning and qualifications, as well as solving difficulties related to State Matura in case of students who had completed secondary education before the introduction of State Matura (e.g. a special quota);
 - define the status of part-time students and reduce differences between full-time and part-time students;
 - define the total funding and tuition fee levels; plan the possibility of concluding programme agreements for part-time studies;
 - propose mechanisms for approval, monitoring and regular assessment of part-time study programmes, etc.

COMPETENT BODY: MSES

IMPLEMENTATION: Working group for amending legislation

INDICATOR: Adoption of amendments

- **MEASURE 2.8.2.** Establish centres for lifelong learning at higher education institutions in order to encourage and coordinate such activities (including part-time studies as a formal type of lifelong learning leading to a relevant qualification)

COMPETENT BODY: National Council for Development of Human Resources

IMPLEMENTATION: MSES, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Amendments to relevant legislation. Assessment of the extent to which the centres are operational. Level of users' satisfaction.





- **MEASURE 2.8.3.** Adopt new syllabi at the level of higher education institutions in order to enable part-time students to acquire learning outcomes, taking into consideration specific type of their study
COMPETENT BODY: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education
IMPLEMENTATION: Higher education institutions
INDICATORS: Syllabi for part-time studies adopted
- **MEASURE 2.8.4.** Analyse needs of the public sector and of companies for programmes in the STEM fields. Organise round tables and similar events on the topic of study programmes in STEM fields and invite representatives of the business sector (human resources departments of large companies, managers, owners of small and medium enterprises, representatives of the public sector, etc.), as well as eminent foreign experts experienced in organising part-time studies in relevant areas. The programme of such events should include a review of the state of affairs and proposals for its improvement, as well as examples of good practice at high-profile institutions.
COMPETENT BODY: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education
IMPLEMENTATION: Higher education institutions
INDICATORS: Analysis implemented and published
- **MEASURE 2.8.5.** Carry out a detailed analysis of current study programmes for part-time students. Update existing study programmes and design new ones aimed at attracting potential students. The result of these programmes should be graduate experts with excellent education, capable of coping with social needs and with the requirements of today's economy and public sector.
COMPETENT BODY: National Council for Science and Higher Education, National Council for Development of Human Resources
IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions
INDICATORS: Revised study programmes. Number of new students. Percentage of graduates employed in relevant occupations within the year following their graduation.
- **MEASURE 2.8.6.** 2.8.6. Expand the existing information system by including data on part-time students. Actively promote the value of part-time studies for individuals, report on their employment opportunities and guide their careers.
This measure has been elaborated in detail under 'Objective 5: Secure appropriate premises and information and communication technologies infrastructure for higher education institutions' (5.2).
- **MEASURE 2.8.7.** Develop a system of supplementary financial measures for enrolling into part-time studies in STEM fields and

develop mechanisms for student scholarships. Encourage cooperation with employers related to this topic.

COMPETENT BODY: National Council for Science and Higher Education, National Council for Development of Human Resources

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions, Croatian Employers' Association and Croatian Chamber of Commerce

INDICATORS: Number of co-funding/scholarship agreements. Assessment of the extent to which the system is operational. Level of cooperation with employers.



OBJECTIVE 3: ENSURE A HIGH-QUALITY HUMAN RESOURCE STRUCTURE AT HIGHER EDUCATION INSTITUTIONS AS A FOUNDATION FOR IMPROVING THE QUALITY OF HIGHER EDUCATION

Until 2013, the higher education and science system had no well-defined and distinctive employment policy, nor a policy of professional development/training and promotion of employees. The employment policy in the system has been disorganised and dependent on current economic trends, personal initiatives and relations between various interest groups and structures.

In the academic year 2011/2012, there were 16 594 staff in the higher education system (12 200 full-time equivalent/FTE), of which 10 377 staff had a temporary employment contract, while the number of part-time staff amounted to 6 217.¹⁰¹ However, teaching staff (including teaching associates) in the higher education system are allowed to teach at two or more higher education institutions and data on their work are usually kept by higher education institutions. This means the Ministry of Science, Education and Sports has no adequately updated and systematised data on such staff.

In the staff structure of the higher education system, an average of 30 per cent are administrative staff and 70 per cent are teaching staff. This structure is common for the majority of higher education institutions and various fields of science, although there are still considerable differences between higher education institutions. In the structure of expenditures of higher education institutions, staff costs prevail (at an average of 80 per cent of total expenditures), which mainly results from the revenue structure of the state budget.

The average teaching staff/student ratio at universities is 1:21, while at polytechnics and schools of professional higher education it is 1:45. The minimal criterion for obtaining a letter of accreditation of higher



education institutions in Croatia (based on the Standards and Guidelines for Quality Assurance in European Higher Education)¹⁰² is to set a maximum ratio of 1:30.¹⁰³ So although there is an adequate number of teaching staff at universities, there is clearly a lack of full-time teaching staff at polytechnics and schools of professional higher education. Only two polytechnics had a teaching staff/student ratio lower than 1:30, according to data from the Ministry of Science, Education and Sports for 14 polytechnics in the academic year 2011/2012.

Future needs for human resources at higher education institutions will be significantly affected by changes in the demographic landscape of Croatia. Current demographic trends clearly show that the number of potential students will be radically reduced.¹⁰⁴ The lowest point of demographic trends refers to the generation born in 2003, when the birth rate was almost 20 per cent lower than the total number of students that enrolled in higher education institutions in 2012. Demographic trends can therefore have a direct influence on employment needs at higher education institutions, as well as on the workload of staff. This will also be directly influenced by possible changes in the structure of primary/secondary education.

It is not possible to forecast the future incoming flow of international students, nor the outgoing flow of students from Croatia to destinations abroad. Based on experiences of other

European countries, higher education institutions should be active in attracting international students, with a clear internationalisation strategy that includes adequate funding.

3.1. INCREASE THE QUALITY OF RESEARCH AND TEACHING AMONG TEACHING STAFF

One of the main preconditions for the quality of higher education is the quality of teaching staff. In the current system, quality has been assured by criteria for appointment into scientific-teaching grades. The criteria are divided into those related to the scientific activity of teaching/research staff and those related to teaching and other activities of teaching staff. The former are stipulated by the National Council for Science, Higher Education and Technological Development (at the time of adoption of the criteria it was still the National Science Council),¹⁰⁵ and the latter by the Rectors' Conference.¹⁰⁶ Both criteria have been defined as minimum criteria, and higher education institutions may stipulate higher criteria for their staff. Minimum research criteria have been defined differently across various scientific fields, and they are rather disparate — and in the case of some fields, even inappropriate. In general, it is easier to satisfy criteria set by the Rectors' Conference than scientific criteria, so the assessment of teaching staff has been focused on the number and

quality of published research papers. In addition, the criteria set by the Rectors' Conference are in most cases formal and they neither assess nor encourage quality of teaching and other activities of a candidate in the appointment procedure.

The Strategy proposes that teaching staff appointments be carried out by higher education institutions based on peer assessment of candidates. The criteria for appointment will also be determined by higher education institutions, based on their obligations to introduce and maintain a policy of quality and to provide students with the best teaching staff at their disposal. Minimum criteria will continue to be prescribed by the National Council for Science, Higher Education and Technological Development, in order to fulfil the state's obligation to define the minimum quality of higher education. Achieving the competitive development of higher education institutions will require the gradual raising of scientific criteria (in particular in scientific fields with lower criteria), which will lead to their harmonisation. There will be defined links between scientific criteria for researchers appointed into research/teaching grades and those appointed into equivalent research grades. In addition, the criteria for the social sciences and humanities will be re-defined. In particular, a system will be developed to define criteria for the arts, respecting the specific characteristics of artistic work, which include artistic achievements that are not validated merely by doctoral studies and research papers, but also by artistic relevance and practice. Criteria related to teaching will also be re-defined since they deserve more attention. Namely, they should evaluate quality in a more direct manner, and not only formally evaluate whether certain activities have been fulfilled. This concept will also be used for re-defining criteria for appointments into teaching grades. Finally, in addition to research and teaching criteria, criteria for the evaluation of teaching staff will take into account their social role (as described in detail under Objective 3.2).

At present, the majority of teaching staff in the higher education system do not undertake any special training for acquiring teaching competences. Although they are experts in the field in which they teach, when it comes to teaching methodology they can only rely on the experiences of their colleagues or on their own intuition and talent. For this reason, in-service training of teaching staff will be introduced in the form of specially designed courses that will be a prerequisite for assuming teaching obligations, as well as a condition for appointment into a research/teaching grade. Such courses will be organised in the form of direct teaching or e-learning. In addition, short courses will be organised aimed at upgrading the competences of teaching staff, not only in terms of pedagogy, but also in terms of other transversal competences such as the use of information and communication technologies or the preparation and submission of a project proposal. Initial training for developing teaching competences will be obligatory for all teaching staff entering the system and will represent a minimum criterion for their first appointment into a teaching (or research/teaching) grade. Further in-service training of teaching staff in





transversal competences will be among the prerequisites set by quality assurance plans of higher education institutions.

Regarding non-teaching staff, since there are currently only occasional courses for their supplementary training, a system of permanent training will be established.

The quality of teaching staff will also be encouraged and rewarded by introducing a variable work assessment in set scales, related to a variable part of their salary. This will be regulated by criteria of fairness and transparency to be defined by respective acts of higher education institutions.

Special attention will be paid to academic and research integrity as the fundamental principles of the work of teaching staff. Higher education institutions will invest all possible efforts in preventing corruption and other forms of unethical conduct. The academic community should set standards of exemplary behaviour both to students and to society in general.

- **MEASURE 3.1.1.** Develop a new uniformed system of criteria for appointment into scientific-teaching grades, artistic/teaching grades, teaching grades and lexicography grades, based on peer assessment
COMPETENT BODY: National Council for Science and Higher Education
IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, a relevant working group
INDICATORS: Relevant regulations developed. Percentage of teaching staff fulfilling the criteria for appointment into each scientific-teaching grade.
- **MEASURE 3.1.2.** Organise centres in the higher education system for training of teaching staff related to pedagogy, psychology, didactics and methodology
COMPETENT BODY: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education
IMPLEMENTATION: Higher education institutions with relevant experts, Agency for Science and Higher Education
INDICATORS: Assessment of the extent to which the centres are operational. Level of users' satisfaction.
- **MEASURE 3.1.3.** Design, adopt and implement in-service training of teaching staff in the higher education system. Make the utmost use of the mechanism of e-learning in the process of planning and implementing these programmes.
COMPETENT BODY: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education
IMPLEMENTATION: Higher education institutions with relevant

experts, a task force for drafting the act, Agency for Science and Higher Education, University Computing Centre-(SRCE)
INDICATORS: Assessment of extent to which the in-service training programmes for teaching staff are operational. Percentage of teaching staff included in the programme.

- **MEASURE 3.1.4.** Develop mechanisms for variable assessment of the work of teaching staff and introduce a variable part of their salary
COMPETENT BODY: MSES
IMPLEMENTATION: Working group appointed for drafting the act, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, trade unions
INDICATORS: Amendments to the act. Assessment of the extent to which the mechanisms are implemented.
- **MEASURE 3.1.5.** Develop a system of lifelong learning of non-teaching staff
COMPETENT BODY: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education
IMPLEMENTATION: Higher education institutions, Agency for Science and Higher Education, University Computing Centre (SRCE)
INDICATORS: Assessment of the extent to which the programmes for supplementary training of non-teaching staff of higher education institutions are implemented

3.2. RE-DEFINING MECHANISMS FOR STRUCTURING THE WORKING HOURS AND TASKS OF TEACHING STAFF

In the last two decades, the task structure of teaching staff at higher education institutions has changed radically. This has been a consequence of the massification of higher education, the accelerated production of knowledge, the implementation of the Bologna system and the alignment with the European Higher Education Area, the introduction of new information and communication technology, and new requirements by the state and other stakeholders in higher education. The traditional areas of work of teaching staff at higher education institutions (teaching and research) have been expanded in scope and complexity. In addition, there are numerous new obligations related to organisation, management and administration, as well as demands of the wider community. These tendencies were not followed by high-quality support and appropriate regulations on monitoring and assessment of the work of teaching staff.¹⁰⁷ The task structure of teaching staff currently does not take into consideration the reality of working conditions (and the wide variety of these working conditions), nor does it recognise activities such as organisational and professional work in academic bodies or involvement in the third mission of higher education institutions. This results in a need to re-define the working hours and tasks of teaching staff, with new structures and com-





prehensive solutions taking into consideration changes that have already occurred and the new working conditions at universities, polytechnics and schools of professional higher education. The new solutions should enable the optimal use of existing human resources, high-quality evaluation of work and the implementation of a quality culture, as well as promoting the role of sustainable development of higher education.

The social role of teaching staff at higher education institutions has changed and now includes four segments: a) teaching/educational activities; b) research/artistic activities; c) organisational, management and professional activities in academic bodies; d) involvement in the third mission of higher education institutions (activities focused on contributing to development and improvement in the community).

Some components of teaching staff obligations are interlinked, so all components should be included proportionally based on the institution's specific characteristics (teaching-research or teaching), its field of work (the specificities of the profession it is working in, or the needs of its region), the status of its teaching staff, its strategy and mission, as well as the focus of the faculty/department and of the individual member of teaching staff.

These are the reasons why the tasks directly related to the teaching process need to be re-defined, since they have changed (expanded) following the introduction of the Bologna Process. Research/artistic tasks will also be re-defined, which implies setting minimum conditions for promotion into grades, as well as additional tasks resulting from research of teaching staff at higher education institutions. The specific characteristics of different fields and a disciplines will be taken into consideration, thereby respecting variations in how individual scientific fields are defined and in how a scientist's contribution to a given scientific field and discipline is evaluated. Special consideration will be given to the specificity of validating the contribution of teaching staff to the arts.

Activities necessary for the management and operation of higher education institutions will also be defined, in order to evaluate the work of teaching staff at a higher education institution as being on a permanent, part-time or one-time basis.

The third mission is increasingly referred to as a task of higher education institutions. It includes various activities focused on the development and improvement of economic, cultural and civil life, implying an integrated concept of cooperation according to which the university has a duty to contribute to all sectors of society. The third mission also implies the civic mission of a university, focused on educating citizens to be active and assume their social responsibility. The assessment of community engagement should be explained in the internal acts of higher education institutions.

- MEASURE 3.2.1.** Define mechanisms for assessing the work of teaching staff at higher education institutions (based on the four segments of their activities) and amend relevant legislation. Determine the approximate ratio of each activity based on the missions of higher education institutions and the specific characteristics of the institutions' fields and professions; define the possibilities for changing the ratio at the level of the higher education institution. Amend relevant legislation accordingly.

COMPETENT BODY: MSES and trade unions

IMPLEMENTATION: Working group appointed for preparing a collective labour agreement

INDICATORS: Amendments to legislation adopted. Level of harmonisation of approximate ratios with the mission of the higher education institution and specific characteristics of its fields, disciplines and professions.
- MEASURE 3.2.2.** Develop protective mechanisms related to the maximum workload of teaching staff at higher education institutions for each segment of their tasks. Use this detailed list of activities when preparing the collective labour agreement.

COMPETENT BODY: MSES and trade unions

IMPLEMENTATION: Working group appointed for preparing collective labour agreement

INDICATORS: Level of protective mechanisms in the collective labour agreement. Level of satisfaction of teaching staff at higher education institutions.
- MEASURE 3.2.3.** Establish and implement mechanisms for the overall assessment of the four segments of tasks of teaching staff at higher education institutions. Use regulations of higher education institutions to stipulate and assess defined activities, as well as contract additional activities subject to the strategic focus of different higher education institutions. Ensure incremental introduction of changes in order to improve the system, with an obligatory (and adequate) period of adjustment. Plan the harmonisation teaching staff tasks at higher education institutions with the duration of their labour contract in current teaching and research-teaching grades. Ensure a transition period for implementing implementing implementing implementing an information campaign about the proposed system, its adaptation and implementation.

COMPETENT BODY: MSES and National Council for Science and Higher Education

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Level of implementation of a new mechanism for evaluating teaching staff activities. Level of harmonisation with the strategic framework of each higher education institution. Duration of the transition period.



3.3. SETTING STANDARDS FOR THE HUMAN RESOURCE STRUCTURE OF HIGHER EDUCATION INSTITUTIONS AND DEFINING STAFF STRUCTURE AND EMPLOYMENT POLICY



Due to significant differences in the human resource structure of higher education institutions, a standard human resource structure will be developed, in order to enable the easier and more efficient contracting of programme agreements. The standard will define overall needs for teaching and non-teaching staff of the higher education institution in terms of study programmes and a number of students. It will also respect the specificities of different study programme with the aim of their optimal implementation.

Higher education institutions differ greatly in the structure of teaching staff (including teaching assistants), as well as in the structure of administrative, professional and support staff. There are significant variations in the range and distribution of staff by (scientific/teaching) grades. This is particularly important for the comparison of faculties, polytechnics and schools of professional higher education implementing study programmes that are similar in content and scope. In addition, there are substantial differences in the proportion of administrative, professional and support staff in the staff structure at higher education institutions. These differences are a result of the excessive fragmentation of the higher education system in which universities have not assumed institutional accountability for defining and managing an employment policy for their institutions. A new staff structure at higher education institutions should be defined based on: a) the scope of education, scientific, artistic or professional work; b) a standard staff workload; c) the standards for conducting higher education activity.

At present, the appointment of teaching staff is based on determining whether a candidate fulfils minimal criteria for appointment into a respective grade as stipulated by the law. Although a public call is announced, appointment is usually related to the promotion of an existing member of teaching staff. The system of appointment of teaching staff will be changed so that appointments relate to an existing post that is vacant or to a new post (according to the staff structure of the higher education institution), respecting the principle of transparency and the obligation of the higher education institution to secure the best teaching staff for its students. In doing so, the minimum criteria for appointment into a respective grade should be kept and a balance should be ensured regarding the contribution of teaching staff to all four types of activities from the previous paragraph. Additionally, the system of appointment into temporary grades for teaching staff who are teaching at a given higher education institution but are not among its staff should be kept. When defining criteria for appointment, institutions should continue to take into account specific characteristics of scientific fields, in particular the artistic field (which differs substantially in its manner of validating the scope of teaching staff). The staff structure should continue to include

staff appointed into associate grades qualified for tasks of assistants, as well as other tasks based on the specific needs of the higher education institution.

- **MEASURE 3.3.1.** Define human resource standards for study programmes (adapted to the type and scope of different study programmes). Use those standards to regulate the organisational structure of staff paid from the state budget.
COMPETENT BODY: MSES and trade unions
IMPLEMENTATION: Working group appointed for defining the human resource standards, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education
INDICATORS: Document on human resource standards prepared and adopted. Regulations on organisation of work-posts at higher education institutions prepared and adopted. Structure of teaching staff at higher education institutions.



OBJECTIVE 4: DEVELOP AN EFFICIENT HIGHER EDUCATION FUNDING SYSTEM THAT STIMULATES DEVELOPMENT

Appropriate funding is a precondition for the development of the higher education system. At the same time, funding must take into account development goals related to the economy, culture, education and science. A strategic approach to funding also implies considering what are the overall investments made, how the funds should be distributed and how to ensure efficient mechanisms for monitoring the implementation of goals. The basis for an efficient higher education funding system should be performance agreements (which will be referred to hereafter in this Strategy as 'programme agreements').¹⁰⁸ Such agreements are signed with the line ministry and take into consideration the specificities of universities, polytechnics and schools of professional higher education. Programme agreements are an important instrument for implementing national higher education policy and research policy, while respecting the autonomy and internal quality assurance systems of higher education institutions. In the next strategic period, it will be important to introduce full-scale programme agreements that encompass the funding of all core activities of the higher education institution, taking into account both national strategic priorities on one side and university autonomy on the other. At the same time, specific mechanisms of contracting and funding will need to be developed for different types of a higher education institution.

4.1. ESTABLISH A SYSTEM FOR ALLOCATING PUBLIC FUNDS TO HIGHER EDUCATION INSTITUTIONS THROUGH FULL-SCALE PROGRAMME AGREEMENTS, ENSURING COMPLETE AUTONOMY FOR THE USE OF FUNDS AND ACCOUNTABILITY FOR ACHIEVED RESULTS



The existing system for funding higher education institutions will be changed by introducing full-scale programme agreements. This funding mechanism will be linked to achieving strategic goals and it will be steered by the principles of transparency, efficiency, quality assurance and the social dimension of higher education. Programme agreements will guarantee the principle of integration of public funding of higher education by jointly regulating the funding of studies/study programmes, student financial support, research and development, as well as the funding of operational costs.

The system will be based on EU models of good practice¹⁰⁹ and it will use instruments such as input- and output-based funding criteria, as well as project-based funding. Programme agreements will be used as the basis for funding all public higher education institutions and may also be used for partial funding of private higher education institutions if there is a public interest. For example, in the case of part-time students, funding will be provided according to the same criteria regardless of the type of the higher education institution or of the founder of the accredited institution. Based on the state's responsibility for the higher education system, the state authorities will therefore use programme agreements in order to provide public funds to the system of public higher education with the aim of meeting social needs, encouraging a quality culture among higher education institutions and encouraging their competitiveness, both within Croatia and abroad. One of the quality assurance mechanisms will be determining the capacities of schools of professional higher education. This will be carried out by the Agency for Science and Higher Education, by determining the number of students that can be enrolled into each of these institutions, based on their human, spatial and material resources. Such a capacity assessment can serve as a basis for signing programme agreements. In the event that public higher education institutions do not meet certain social needs due to their limited capacity or to the lack of study programmes in certain fields, private higher education institutions providing such programmes (and/or other programmes of special public interest) could also receive public funds through signing a programme agreement. Such a relationship between public and private institutions and their funding is common in the majority of European countries, in particular in Western Europe and certain Scandinavian countries (although the term 'private higher education institution' does not have the same meaning in all the countries).¹¹⁰

Programme agreements will be used for funding all levels of study programmes, from undergraduate to doctoral studies. The funding system will be developed based on the number of enrolled students per scientific

field (according to the fields of their study programmes), in order to secure transparency and to take into consideration the different costs for implementing particular study programmes. Since polytechnics and schools of professional higher education do not have the same level of autonomy as public universities, a special set of contracting procedures and activity levels will be defined. Universities and polytechnics shall develop rules for implementing the objectives of programme agreements, in particular the allocation of funds to their constituent units in line with objectives. The new funding model will be introduced gradually in order to avoid any disruption of activities of higher education institutions.

Some funds allocated to higher education institutions will include financial incentives for achieving strategic objectives in higher education, using a funding model of output criteria and/or project-based funding. This type of funding will imply that various ministries allocate public funds to higher education institutions, not only the line ministry for science and higher education. It will enable other ministries to participate in the development of the human resources necessary for upgrading the activities under their authority.

The current system demands that management bodies of higher education institutions deliver results, but provides them with only limited autonomy to allocate their own funds. Enhancing their autonomy to allocate funds is therefore a precondition for the efficient management of higher education institutions.¹³³ At the same time, it is important to base the system on the principles of transparency, efficiency, quality assurance and social dimension.

In addition to developing a new funding model, it is necessary to improve the management of the system, both at the national level and at the level of higher education institutions, in order to achieve an evidence-based, efficient and transparent development of the higher education system in Croatia. To this end, the system for collecting financial data will be improved, both at the level of higher education institutions and at the national level. This will enable high-quality management and evidence-based policy making.

- **MEASURE 4.1.1.** Develop and implement a funding model based on programme agreements
COMPETENT BODY: MSES, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education
IMPLEMENTATION: Relevant working group, higher education institutions
INDICATORS: Document prepared and adopted. Assessment of the extent to which the model is operational.
- **MEASURE 4.1.2.** Various ministries shall develop a system for co-funding higher education. Determine the proportion of funding that each ministry will contribute to higher education funding.

COMPETENT BODY: Government of the Republic of Croatia

IMPLEMENTATION: Line ministries

INDICATORS: Document prepared and adopted and relevant legislation amended. Percentage of fulfilled financial commitments in comparison to a the funding proportion defined by each ministry.



- **MEASURE 4.1.3.** Establish a system for collecting and managing financial data in order to achieve high-quality management and evidence-based policy making in higher education

This measure has been elaborated in detail under 'Objective 5: Secure appropriate premises and information and communication technologies infrastructure for higher education institutions' (see 'Specific objective 5.2: Upgrade information and communication technologies infrastructure').

4.2. ENCOURAGING INVESTMENT IN HIGHER EDUCATION FROM THE PUBLIC AND PRIVATE SECTOR

Croatia's public expenditure on higher education (at 0.73 per cent of GDP) is among the lowest level of expenditures in Europe. Such low expenditure prevents any serious reform of the higher education system. One of the main objectives in the following period will therefore be to raise Croatia's expenditure on science and higher education to the EU-average level. At the same time, this measure implies a real understanding of the role of education and research as a driver of economic and social progress and a genuine commitment to the developing a knowledge-based society. The minimal objective of Croatia in terms of public expenditure is to reach the median level of European countries by 2020. It should be noted that it will be necessary to secure an appropriate level of investment in order to allow for the absorption of EU funds. A proportion of funds will also be secured by investing income from the sale of state property or state concessions.

It is clear that adequate funding of higher education institutions cannot be achieved exclusively through the use of state budget funds. A system should therefore be developed to secure funding for higher education institutions from other sources, primarily from the business sector. In the last 20 years, the business sector lost considerable interest for investing in higher education, and also partially lost the possibility to do so. Creating interest networks that include economic and academic institutions, as well as ministries, agencies, chambers and other institutions involved in a certain sector, could lead to larger cooperation between the business sector and higher education institutions, and could result in an increased investment in the higher education system. Appropriate tax policy will be used to encourage investments of the business sector into higher education. The creation of sectoral interest networks could also enable a more permanent influence of employers on study programmes, their content and their manner of implementation, in particular on elements for practical modules of study programmes (e.g. work placements). Higher education institutions also derive some funds from international projects,

in particular for research. Networking of higher education institutions within interest networks and linking academic and business sectors would increase their competitiveness in terms of applying to international projects. This could consequently increase the proportion of international funds in their budgets.

- **MEASURE 4.2.1.** Gradual increase of the state budget expenditure on higher education until reaching the EU median level
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: Ministry of Finance, MSES
INDICATORS: Percentage of state budget expenditure on higher education in comparison to EU median
- **MEASURE 4.2.2.** Develop and implement a system of tax reliefs for economic entities and private entities investing in higher education
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: Ministry of Finance
INDICATORS: Level of implementation of the system. Level of users' satisfaction.
- **MEASURE 4.2.3.** Develop a system for allocating part of the income from the sale of state property (and/or gained from state concessions) to higher education
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: Ministry of Finance, MSES
INDICATORS: Level of implementation of the system. Percentage of funds allocated to higher education.
- **MEASURE 4.2.4.** Establish sector interest networks and include higher education institutions, employers, state authorities and other relevant stakeholders in the networks.
COMPETENT BODY: Special committee for the implementation of the Strategy (appointed by the Government of the Republic of Croatia)
IMPLEMENTATION: Line ministries, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, Croatian Employers' Association, Croatian Chamber of Commerce
INDICATORS: Number of interest networks that have been established and that have begun to implement regular activities. Level of inclusion of relevant stakeholders.



OBJECTIVE 5: SECURE APPROPRIATE PREMISES AND INFORMATION AND COMMUNICATION TECHNOLOGIES INFRASTRUCTURE FOR HIGHER EDUCATION INSTITUTIONS



HIGHER
EDUCATION

The law stipulates the minimum amount of space that higher education institutions need to ensure in order to obtain approval for teaching students.¹¹² Material resources of public higher education institutions vary considerably and many institutions lack sufficient resources to implement their tasks to a high level of quality and to be internationally competitive. The premises at some higher education institutions do not comply with minimum standards of teaching and research. In addition, the organisational structure of contemporary higher education institutions requires an appropriate infrastructure to ensure teaching excellence and to ensure an equal position within the European Higher Education Area.

Nowadays it is evident that achieving an excellence in higher education and research is not possible without up-to-date and advanced information and communication technologies (ICT) infrastructure. It is indispensable for new research methodologies and for advances in research, as well as for enabling a cooperation-friendly environment. ICT infrastructure implies a set of tools enabling cooperation between teaching staff, students and researchers, irrespective of their geographic location or of their distance from research resources.

Securing adequate premises and infrastructure will therefore be among the priorities in the area of higher education and science.

5.1. SECURING ADEQUATE SPATIAL STANDARDS AND EQUIPMENT

A clear link will be established between higher education institutions' need for space and their number of students, study programmes and research requirements, based on the field of the study programme/research. An plan for investing in infrastructure development will also be developed, taking into consideration current premises, the period of their use and functionality, as well as an analysis of the sustainability of new premises in terms of maintenance costs. During the construction of new facilities, premises should be joined on the basis of their function and programmes in order to secure their optimal use and sustainability. Energy-efficient and sustainable construction will be encouraged during the planning and construction of facilities.

Four large Croatian universities have conducted an analysis of their needs for new premises. In the last few years, they have already begun to construct their campuses with the aim not only to expand their space, but also to carry out functional integration of university faculties and

increase the quality of studies. In addition, such university campuses have larger influence in the local community and present an important instrument for reaching a large number of objectives defined by strategic documents, including this Strategy.

- **MEASURE 5.1.1.** Analyse the current spatial capacity of higher education institutions and determine national investment priorities and a realistic roadmap. This measure should also include the use of current data available at MSES and the collection of additional data for evidence-based decisions on national priorities.

COMPETENT BODY: MSES, National Council for Science and Higher Education

IMPLEMENTATION: An appointed working group

INDICATORS: Analysis conducted and published. National investment priorities published. Extent to which results of analysis are used when setting priorities. Level of efficiency of resource usage.

- **MEASURE 5.1.2.** Construction of new and renewal of current capacities of higher education institutions. National priorities should include initiated projects for upgrading spatial capacities.

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Premises of higher education institutions constructed and renewed. Level of efficiency of resource usage.

5.2. UPGRADING INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) INFRASTRUCTURE

An up-to-date information and communication technologies (ICT) infrastructure is a precondition for the operation of higher education institutions for all levels of activities, from technical-administrative work to teaching. It is particularly important to ensure the technical preconditions for the development of e-learning and distance learning, based on contemporary global trends and on the needs of various under-represented groups. Current ICT support to higher education institutions consists of two large ICT networks (ISVU¹¹³ and MOZVAG¹¹⁴), and these are not sufficient. Both networks have been created autonomously and they neither correlate nor contain all the data required for evidence-based policy-making in the process of managing higher education institutions. Administrative services of higher education institutions lack ICT tools (which would also need to be linked to the existing current ICT systems mentioned above). Finally, it will be necessary to secure the inter-operability of all existing and new systems.

The use of ICT in teaching should be enhanced. The number of e-courses, the manner of their implementation and their overall importance





vary considerably between higher education institutions and study programmes. It is necessary to ensure free access to teaching materials (including textbooks, manuals and other literature) to the greatest extent possible in order to enable students easier access to high-quality literature, as well as to lower students' study-related costs. Initial investment into such development would require both significant funding and securing trained human resources.

- **MEASURE 5.2.1.** Develop a plan for developing an information and communication technologies infrastructure for the period until 2020
COMPETENT BODY: MSES
IMPLEMENTATION: Croatian Academic and Research Network (CARNet), University Computing Centre (SRCE), National and University Library in Zagreb, Agency for Science and Higher Education, higher education institutions
INDICATOR: Plan developed and adopted
- **MEASURE 5.2.2.** Upgrade and expand information and communication technologies (ICT) infrastructure
This measure has been elaborated in detail in the Strategy chapter 'Science and Technology'.
- **MEASURE 5.2.3.** Upgrade and link existing information systems in the area of higher education. Link the higher education information systems to the systems in the area of science and lifelong learning in order to ensure the availability of integral and high-quality information needed for decision-making related to the system of higher education and science.
COMPETENT BODY: MSES
IMPLEMENTATION: Croatian Academic and Research Network (CARNet), University Computing Centre (SRCE), National and University Library in Zagreb, Agency for Science and Higher Education, higher education institutions
INDICATORS: Level of implementation of a unique information and communication technologies system for higher education and science. Level of usage of results for decision-making. Level of inter-operability with data from the area of science and lifelong learning.
- **MEASURE 5.2.4.** Develop a package of programme tools for managing higher education institutions
COMPETENT BODY: MSES
IMPLEMENTATION: The measure will be implemented by public procurement
INDICATOR: Level of implementation of information support
- **MEASURE 5.2.5.** Define models and upgrade systems for the development and use of open educational contents, including litera-

ture and other open-access teaching material

COMPETENT BODY: MSES

IMPLEMENTATION: Croatian Academic and Research Network (CARNet), University Computing Centre (SRCE), National and University Library in Zagreb, university libraries, higher education institutions

INDICATOR: Level of implementation of the open-access system.
Percentage of teaching materials available in the open-access system.



OBJECTIVE 6: IMPROVE THE STUDENT FINANCIAL SUPPORT SYSTEM WITH A SPECIAL EMPHASIS ON THE SOCIAL DIMENSION OF HIGHER EDUCATION

Investing in student financial support and in the social dimension of higher education is closely related to one of the main strategic objectives of higher education: making it accessible to all, based on individual ability. From the Prague Communiqué in 2001¹¹⁵ to the Bucharest Communiqué in 2012,¹¹⁶ the ministers of education of the 47 signatory countries of the Bologna Process confirmed the importance of ensuring equity in higher education by introducing the term ‘the social dimension of higher education’. The social dimension has been defined both as a process and an objective: namely, the social profile of ‘the student body entering, participating in and completing higher education at all levels should reflect the diversity of our populations’ (London Communiqué, 2007).¹¹⁷

The main findings of the research project entitled EUROSTUDENT¹¹⁸ (conducted in 2010) highlight the following problems in the area of social dimension of higher education in Croatia:

- There are inequalities of access to higher education, in particular for individuals of lower socioeconomic status, youth with disabilities and health problems, children without parental care and children of the Roma minority.
- Vulnerable groups in higher education have more financial difficulties and a higher workload burden than other students (in addition to the vulnerable groups mentioned in the previous point, the category includes students who are parents, students older than 25 and students with secondary vocational school qualifications).
- Certain living and studying conditions may have a negative influence on the experience of studying, as well as on the acquisition of learning outcomes. These are: paying tuition fees; studying as a part-time student; working in parallel to studying; and living in more expensive accommodation.
- Study conditions are less favourable for students of professional study programmes, in comparison to conditions for students of university study programmes. The majority of students of



professional study programmes study as part-time students and work in parallel to studies, which does not allow them access reduces their eligibility for access to student dormitories and scholarships.

6.1. REFORMING THE STUDENT FINANCIAL SUPPORT SYSTEM TO INCREASE EQUITY

Student financial support consists of direct and indirect measures and incentives provided by the state, by local and regional authorities and self-governments, as well as by other public and private companies and organisations. The majority of direct student financial support is provided at the level of the Ministry of Science, Education and Sports (MSES), as opposed to countries with separate public institutions managing such support programmes. Students obtain direct support in the form of scholarships, and indirect support in the form of subsidised tuition fees, accommodation, meals, health insurance, transportation and tax reliefs. According to MSES data, in the period 2005–2010, the average annual investment in direct and indirect student financial support was approximately 500 million HRK (67 million EUR).

At present, 4 200 students receive state scholarships (app. 2.8 per cent of full-time students).¹¹⁹ Students who are awarded state scholarships are entitled to receive them for the entire duration of their full-time studies. In addition, universities award a limited number of scholarships based on the criteria of academic merit, low socioeconomic status and disability. In addition to MSES, other ministries also have scholarship schemes, thereby contributing to the student financial support system and supporting the higher education system. According to available data, there are a total of 9 000 scholarships at the national level (covering approximately 6 per cent of the student body). There are also many examples of scholarship programmes at the level local and regional authorities and self-governments. Since the student financial support system is centralised to a great extent, there is both a problem of bureaucratisation and of a lack of civil servants, often resulting in a lack of sensitivity for individual students' needs and in a considerable delay in implementation and payment of student support.

Indirect student financial support is regulated by the Act on Scientific Activity and Higher Education, which defines the rights of full-time students with regards to subsidised tuition fees, health insurance, meals and accommodation during their studies. Subsidised tuition fees have been regulated by pilot programme agreements signed in December 2012 between MSES and higher education institutions. For the period 2012–2015, MSES committed to fully subsidise tuition fees (i.e. provide access to higher education free of charge) for all full-time students enrolling in the first year of a study programme at the undergraduate or graduate level (including students of integrated study programmes). For

all subsequent years, tuition fee subsidies are provided to those full-time students who regularly progress within their study programme (i.e. students who obtain a minimum of 55 ECTS in the previous year of their study programme). Higher education institutions have committed to improve the system of studies during the period covered by the pilot programme agreements¹²⁰ and to fulfil at least four objectives from the group of eligible obligatory and optional objectives.

Students who are not covered by tuition fees subsidies must pay tuition fees according to various models adopted autonomously by higher education institutions.

MSES is responsible for the implementation of indirect financial support for meals, accommodation and student programmes, while so-called Student Centres (owned by higher education institutions) are responsible for the direct provision of these forms of student support. Regarding accommodation subsidies, the prices of accommodation are determined by Student Centres and vary between universities. In addition, MSES also subsidises students in private accommodation through a public call. The criteria for being awarded subsidised accommodation in student dormitories include a mix of merit and social criteria, while the number of available subsidies is limited by the capacity of student dormitories and by the limited number of subsidised places in private accommodation. Meals of full-time students in student restaurants are largely subsidised. Finally, transportation costs are also partially subsidised from the state budget in the cities of Rijeka, Split and Osijek, while in the majority of cases local transportation is subsidised by local authority and self-government. There are special arrangements to support the transport of students with disabilities.

This analysis has shown that the student financial support system in Croatia relies predominantly on indirect support, while only a small proportion of the student body receives direct state support. The majority of allocations for indirect support relate to subsidised meals in student restaurants. Such a system is inefficient and lacks a social dimension since indirect support is not provided based on students' socioeconomic status (with the exception of support for student accommodation). In the following period, a new model will therefore be developed with more funds allocated to direct financial support based on the criteria of genuine need, efficiency and transparency. Special attention will also be paid to encouraging secondary-school students of the Roma minority to enrol in higher education, since the current number of 20 enrolled Roma students is unacceptably low.

- **MEASURE 6.1.1.** Develop a project for reforming the student financial support system in Croatia, based on comparative analysis of the student financial support systems in Croatia and Europe

COMPETENT BODY: MSES

IMPLEMENTATION: Public institutes with the necessary expertise





INDICATORS: Comparative analysis of student financial support developed and published. Project prepared for reforming the system.

- **MEASURE 6.1.2.** Establish a new national system of student financial support that is predominantly based on direct support (through grants as the main support instrument, and through subsidised student loans as a supplementary instrument) and that is available to all students (including part-time students). The student financial support system should be based on the criterion of student need (e.g. socioeconomic status or other criteria applying to vulnerable groups). This criterion should be used for determining the amount and type of support. Decrease indirect support relating to subsidised meals, but increase indirect support for student accommodation by constructing and renovating student dormitories.

COMPETENT BODY: MSES

IMPLEMENTATION: Working group appointed for developing the national system of financial student support; Rectors' Conference; Council of Polytechnics and Schools of Professional Higher Education; student councils

INDICATORS: Assessment of the extent to which the national system is operational. Duration of the transition period. Total amount of grants and student loans as a percentage of overall investment. Percentage of part-time students included in the student financial support system. Percentage of needs-based financial support (used for determining the amount and type of grant). Percentage of decreased indirect support in the form of subsidised meals. Percentage of increased indirect support for student accommodation.

6.2. DEVELOP A PROGRAMME FOR IMPROVING THE SOCIAL DIMENSION AND ANALYSE ACCESS AND COMPLETION OF UNDER-REPRESENTED GROUPS IN HIGHER EDUCATION

The inclusion of under-represented groups in the higher education system is among the priorities for developing the European Higher Education Area.¹²¹ In Croatia, a comprehensive policy will be developed for the inclusion of under-represented groups.

- **MEASURE 6.2.1.** Establish a cross-sectoral national working group for improving the social dimension of higher education, in line with good practices from other European countries. The working group should act as an advisory body to the Government of the Republic of Croatia, to MSES, to the Rectors' Conference and to the Council of Polytechnics and Schools of Professional Higher Education.

COMPETENT BODY: MSES

IMPLEMENTATION: Line ministries, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, representatives of students' conferences

INDICATORS: Body established based on experiences of other European countries

- **MEASURE 6.2.2.** Identify under-represented and vulnerable groups in higher education and determine the factors that contribute to the low inclusion of students from these groups
COMPETENT BODY: MSES
IMPLEMENTATION: National group for improving social dimension of higher education
INDICATORS: Document developed and published
- **MEASURE 6.2.3.** Develop and implement a national action plan for improving the social dimension, taking into consideration a need for coordinated measures at all levels of the education system. Develop and launch a national grants programme for under-represented and vulnerable groups of students.
COMPETENT BODY: MSES
IMPLEMENTATION: National group for improving social dimension of higher education
INDICATORS: Level of implementation of the action plan and of the national grants programme for under-represented and vulnerable groups of students
- **MEASURE 6.2.4.** Develop an integrated system for monitoring the enrolment, progression and completion of students from under-represented and vulnerable groups
COMPETENT BODY: Agency for Science and Higher Education, National Council for Science and Higher Education
IMPLEMENTATION: Higher education institutions, University Computing Centre (SRCE), State Bureau of Statistics
INDICATORS: Assessment of the extent to which the monitoring system is operational. Level of integration of the monitoring system with the information-communication system of higher education institutions.

6.3. EXPANDING STUDENT ACCOMMODATION CAPACITIES, CONSTRUCTING NEW FACILITIES AND RENOVATION OF EXISTING CAPACITIES

A study conducted within the EU-funded project entitled ACCESS showed that accommodation costs are the largest item in students' overall costs.¹²² The Croatian part of the study was conducted by the Institute for the Development of Education with support and data provided by all Croatian universities. The cost of accommodation was particularly prominent in the case of students with higher overall costs, while the category of students with lower total costs had a smaller proportion of accommodation costs. This shows that there is a great difference in costs of studies between students living in student dormitories and those living in rented apart-





ments. Subsidies for accommodation expenditures therefore have the most significant impact on students' living standards. This is particularly important since the current system for subsidising accommodation is socially sensitive. Namely, the socioeconomic status of students is taken into consideration when awarding places in student dormitories. At present, 11 per cent of all students live in student dormitories, while as many as 31 per cent live in rented apartments. Capacities of dormitories will therefore be increased following the renovation and adaptation of existing dormitories.

- **MEASURE 6.3.1.** Develop and implement a plan for the construction of new/renovation of existing accommodation capacities in student dormitories. When planning and constructing new infrastructure at higher education institutions (in the framework of emerging campuses), it is important to include the planning and construction of students accommodation capacities.

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education

INDICATORS: Level of implementation of the plan for the construction of new and renovation of existing accommodation capacities in student dormitories. Number of available places in student dormitories.

6.4. ENSURING MINIMUM STANDARDS OF ACCESS TO HIGHER EDUCATION INSTITUTIONS FOR STUDENTS WITH DISABILITIES

There are significant differences between higher education institutions regarding the access of students with disabilities. Some higher education institutions have accomplished significant achievements in the last ten years regarding the inclusion of students with disabilities, while some higher education institutions experience great difficulties in this area. For this reason, the preconditions for providing access to students with disabilities will be harmonised at the national level, in line with the goal that higher education should be accessible to all. The implementation of defined guidelines will be ensured, as well as the implementation of accessibility standards developed with the Tempus project *EDUQuality*,¹²³ which included all Croatian universities, and which have already been supported by the Rectors' Conference.

- **MEASURE 6.4.1.** Ensure a national funding system for increasing access to students with disabilities

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Level of the implementation of the national funding system. Level of users' satisfaction.

- **MEASURE 6.4.2.** Adjust the procedures for application and enrolment into higher education institutions to persons with disabilities. All necessary information about enrolment into the higher education institutions should be made equally available to persons with disabilities.

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Level of modification of procedures. Level of users' satisfaction.

- **MEASURE 6.4.3.** Adjust approaches to teaching and to the assessment of knowledge, skills and abilities for students with disabilities, and enable them to demonstrate their acquisition of defined learning outcomes in an equitable way. Organise relevant training for teaching staff.

COMPETENT BODY: Agency for Science and Higher Education

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Level of modification of approaches to teaching and assessment. Level of users' satisfaction.

- **MEASURE 6.4.4.** Ensure assistive technology and teaching assistants for students with disabilities

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Percentage of assistive technology and teaching assistants ensured by higher education institutions in comparison to defined needs

- **MEASURE 6.4.5.** Ensure the operation of services and expert bodies providing support to students with disabilities at higher education institutions

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Percentage of institutions with offices or services for students with disabilities. Assessment of extent to which offices or services are operational.

MEASURE 6.4.6. Ensure physical accessibility of higher education institutions through use of universal design, thereby making all resources intended for students available to all (including students with disabilities)





- **MEASURE 6.4.6.** Ensure physical accessibility of higher education institutions through use of universal design, thereby making all resources intended for students available to all (including students with disabilities)
COMPETENT BODY: MSES
IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions
INDICATORS: Level of accessibility of all premises of higher education institutions for persons with disabilities
- **MEASURE 6.4.7.** Ensure special transportation for students with disabilities. The support services for students with disabilities at higher education institutions should report every academic year on the needs for special transportation of students with disabilities.
COMPETENT BODY: MSES
IMPLEMENTATION: Local self-government, NGOs providing social services
INDICATOR: Percentage of students with disabilities using special transportation
- **MEASURE 6.4.8.** Comprehensive collection of data on students with disabilities in the higher education system (both on those entitled to various forms of support and on those making use of such support) in order to monitor their progression and improve support system
COMPETENT BODY: MSES
IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions
INDICATORS: Assessment of extent to which the system for monitoring enrolment, progression and completion of studies of students with disabilities is operational. Level of the integration of the system into the information and communication technologies system of higher education institutions. Level of use of available data in the processes of upgrading support.

6.5. ENCOURAGE ACTIVITIES AND PROGRAMMES FOR STUDENT PARTICIPATION IN CULTURE, SPORTS AND SOCIAL EVENTS

In addition to activities related to their studies, students should be provided with extra-curricular contents that are currently under-represented at the majority of higher education institutions in Croatia. For instance, the University of Zagreb only has five sports halls and has neither a theatre nor a venue that would be appropriate for music events. Therefore, in addition to constructing (or renovating) buildings at higher education institutions, facilities will be planned for activities aimed at increasing student participation in culture, sports and social events. This is particu-

larly important for the construction of new student campuses. In addition, the specific needs of art students in students' dormitories should also be taken into account. It is also necessary to enable the interaction of art students with other students on student campuses in order to develop new cultural activities available to all students.

- **MEASURE 6.5.1.** Develop and implement a plan for the construction of new facilities (and renovation of current ones) related to student participation in culture, sports and social events

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, students' conferences

INDICATORS: Level of implementation of the plan for constructing new facilities (and renovation of current ones) related to student participation in culture, sports and social events. Number of new and renovated facilities for student participation in culture, sports and social events.



OBJECTIVE 7: INTERNATIONALISE HIGHER EDUCATION AND ENHANCE ITS INTEGRATION INTO THE EUROPEAN AND GLOBAL HIGHER EDUCATION AREA

The globalisation of higher education is a process that has intensified significantly in the last two decades. This is particularly evident in Europe since the introduction of the Bologna Process and of the European Qualifications Framework, which has led to the removal of various administrative and academic obstacles to mobility of students, teaching staff and researchers. In addition, the system of European Framework Programmes has encouraged cooperation in the planning and implementation of scientific research between higher education and research institutions in Europe and worldwide. European higher education institutions have accepted the process of internationalisation and this has resulted in an overall increase in the quality of education and in the accelerated development of scientific research. The internationalisation of higher education institutions in Croatia therefore represents a strategic goal for their development.¹²⁴

7.1. INCREASING INCOMING AND OUTGOING MOBILITY OF STUDENTS AND TEACHING STAFF

The increased international mobility of students and teaching staff has for several years been a trend that has substantially marked European higher education. All high-quality higher education institutions of the European Higher Education Area have recognised internationalisation as one of main mechanisms not only for increasing the quality study



programmes, but for increasing the quality of education as whole.¹²⁵ The League of European Research Universities (LERU), an association of 21 top-quality European universities,¹²⁶ discussed in detail the importance of the mobility of teaching staff and students (in its April 2013 Bulletin) and reviewed the possibility for introducing obligatory mobility within study programmes, despite the high costs related to this measure.

Although funding the mobility of students and teaching staff has been integrated into the system through mobility programmes such as ERASMUS¹²⁷ and CEEPUS,¹²⁸ analyses have shown that the number of Croatian undergraduate and graduate students using these possibilities is too low (only one per cent of students are involved in outgoing mobility for a period of study). The largest and the most important programme for mobility of students and teaching staff among EU Member States is ERASMUS (which was a sectoral programme of the Lifelong Learning Programme prior to 2014). In 2014, the programme gained a new dimension by integrating several existing programmes under ERASMUS+.¹²⁹ For several years, there has been a trend of increasing funds for ERASMUS in Croatia, and the funds that have been allocated to mobility have been almost fully used. This demonstrates the interest of Croatian students for international mobility. It is therefore necessary to implement measures contributing to reaching the goal of 20 per cent of students graduating in the European Higher Education Area in 2020 who have spent a period of learning mobility abroad. A semester of mobility in the framework of ERASMUS, CEEPUS or similar mobility networks should amount to at least ten per cent of outgoing mobility and five per cent of incoming student mobility. However, it should be noted that the majority of semester-mobility has been carried out in the framework of ERASMUS+ and that Croatia cannot decide on increasing its quota independently. This evidence is based on European trends showing that ERASMUS mobility quota will be increased with each new cycle.

Following the example of other European countries, Croatia should introduce scholarships for foreign students of postgraduate programmes and foreign post-doctoral researchers, and these scholarships should not be limited to bilateral agreements between higher education institutions. This would lead to an increase in the overall number of doctoral students and post-doctoral researchers (which would lead to increased competitiveness) as well as to internationalised research teams (which in turn leads to enhanced international cooperation and quality of research and teaching). There is also a need to provide scholarships for Croatian students enrolled to study in doctoral programmes abroad, but that would also include an obligation to return to Croatia upon obtaining their doctoral degree. Finally, there is a need to increase feasible and sufficiently-funded bilateral cooperation agreements between Croatian higher education institutions and foreign partners, in particular from countries not included in European cooperation networks.

for young Croatian researchers and to ensuring the continuation of their research/teaching career at Croatian higher education institutions. Since study visits at renowned foreign universities are extremely important for the quality of teaching, mobility of teaching staff should be validated systematically.

Study visits to prominent higher education institutions or scientific research institutes abroad will be included into obligatory criteria for appointments to the grade of assistant professor or further appointments. Grants will also be available for study visits to Croatia by prominent foreign researchers, as well as for study visits of Croatian researchers employed at prominent higher education institutions abroad. In the course of such study visits, they will transfer their knowledge to colleagues in Croatia, make an impact on the system of organisation of scientific and scientific-teaching activity at their host institutions, and establish long-term ties.

Teaching staff and scientists included in incoming mobility to Croatia should not be treated as other foreign workers employed in the country. Since they contribute significantly to development of science and higher education, administrative procedures related to their entry and residence should be facilitated as much as possible. Although this segment has improved with Croatian accession to the EU, similar procedures should be applied to scientists from outside the EU.

- **MEASURE 7.1.1.** Increase funds for the mobility of students and teaching staff in order to ensure an outgoing student mobility rate of ten per cent and incoming student mobility rate of five per cent by 2020 (both semester- and degree-mobility). Develop a plan for increasing mobility. Total funds for mobility should be increased by an average rate of 17 per cent annually up to 2020. Funds for mobility of teaching staff and students should be planned in the European Social Fund through the Operational Programme 'Efficient Human Resources 2014–2020'. Higher education institutions should be encouraged to apply to relevant ERASMUS+ calls.

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions, Agency for Mobility and EU Programmes

INDICATORS: Rates of outgoing and incoming mobility of students and teaching staff. Level of funding to support mobility.

- **MEASURE 7.1.2.** Remove internal obstacles to mobility at higher education institutions. Obstacles related to recognising ECTS credits obtained during mobility period at higher education institutions should be removed. There should be an adequate system for encouraging students to take part in mobility programmes.

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education





IMPLEMENTATION: International relations offices, ECTS coordinators
INDICATORS: Regulations on recognising ECTS credits obtained during mobility are developed and adopted. Percentage of removed obstacles. Level of users' satisfaction.

- **MEASURE 7.1.3.** Introduce obligatory training abroad as a criterion for appointment into scientific-teaching grade
COMPETENT BODY: National Council for Science and Higher Education
IMPLEMENTATION: Field councils, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions
INDICATORS: Requirement is introduced. Percentage of teaching staff trained at higher education institutions abroad.
- **MEASURE 7.1.4.** Ensure a scholarship scheme for foreign doctoral students at higher education institutions in Croatia. Ensure grants for foreign doctoral students at higher education institutions in Croatia for a period of three to four years. Plan grants in programme agreements and through the ESF (through the Operational Programme 'Efficient Human Resources 2014-2020') and link them to research projects.
COMPETENT BODY: MSES
IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions
INDICATORS: Number of foreign doctoral students in Croatia. Percentage of foreign doctoral students receiving grants.
- **MEASURE 7.1.5.** Ensure a scholarship scheme for Croatian doctoral students at higher education institutions in Croatia. Secure grants for early-stage researchers from higher education institutions in Croatia at prominent universities in Europe and beyond for a period of three to four years. Plan grants in programme agreements and in through the ESF (through the Operational Programme 'Efficient Human Resources 2014-2020') and link them to research projects, with a requirement that early-stage researchers return to Croatia upon obtaining their degree.
COMPETENT BODY: MSES
IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions
INDICATORS: Number of Croatian doctoral students enrolled at prominent European universities. Percentage of Croatian doctoral students enrolled in postgraduate programmes abroad receiving grants. Level of integration of grants into programme agreements. Percentage of early-stage researchers who returned to Croatia after obtaining their doctoral degree.

- **MEASURE 7.1.6.** Secure a one-year scholarship scheme for foreign researchers at higher education institutions in Croatia. Scholarships should be included into programme agreements and linked to research projects. Higher education institutions should be encouraged to apply to calls of the EU programme Horizon 2020 that enable this activity.

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions, Agency for Mobility and EU Programmes

INDICATORS: Number of visiting professors at Croatian higher education institutions. Percentage of visiting professors who receive grants.

- **MEASURE 7.1.7.** Enhance the capacities of offices for international cooperation at higher education institutions

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions, Agency for Mobility and EU Programmes

INDICATORS: Number and structure of staff in offices for international cooperation. Level of users' satisfaction.



7.2. ENCOURAGING TEACHING IN FOREIGN LANGUAGES

Increased incoming student mobility is only possible if Croatian higher education institutions increase the availability of courses/modules or entire study programmes in English (or another foreign language). Introducing a few courses in English is a good start in order to increase mobility. However, in the long term it should lead to the provision of structured units with 30 ECTS points that students can accumulate over the course of one semester. In addition, it is important to ensure the availability of entire study programmes in foreign languages in all parts of Croatia.

- **MJERA 7.2.1.** Secure financial support for teaching in foreign languages. Gradually introduce courses/modules, to be followed by doctoral and master programmes in English or another foreign language. Develop a system for teaching in a foreign language and secure financial support. Such a measure should be planned in programme agreements and through the ESF (through the Operational Programme 'Efficient Human Resources 2014-2020'). In addition, higher education institutions should be encouraged to apply to ERASMUS+ calls that include this activity.

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Number of study programmes implemented in foreign

languages. Percentage of study programmes implemented in foreign languages receiving financial support.

7.3. ENCOURAGING THE ESTABLISHMENT OF JOINT STUDY PROGRAMMES WITH WORLD-CLASS HIGHER EDUCATION INSTITUTIONS FROM EUROPE AND BEYOND



HIGHER
EDUCATION

The trend of establishing joint study programmes between higher education institutions in the EU has increased in the last few years. According to the Bologna Process Implementation Report 2012,¹³⁰ Croatia is in the category of countries with less than five per cent of higher education institutions participating in joint study programmes. In the majority of developed countries, the number of higher education institutions participating in joint study programmes exceeds 50 per cent. Joint study programmes enable higher education institutions to join a given study programme based on their strategic priorities or specific characteristics. Such programmes lead to an increase in the overall quality of the study programme, since each higher education institution provides a student with one part of the education process, based on its specialisation. Higher education institutions in Croatia should join this trend based on their strategic goals. International cooperation in the form of joint study programmes may be particularly important for smaller universities and polytechnics since specialising in certain scientific fields is particularly relevant for this type of institutions.¹³¹

- **MEASURE 7.3.1.** Develop a plan for participation in joint study programmes at all levels. Identify strategic partners and negotiate on the creation of joint study programmes. Adopt mechanisms for the accreditation of joint study programmes. Adopt a system of internal rules of higher education institutions for participation in joint study programmes.

COMPETENT BODY: MSES

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, Agency for Science and Higher Education

IMPLEMENTATION: Higher education institutions

INDICATORS: Level of implementation of plans for participation in joint study programmes. Regulations adopted.

- **MEASURE 7.3.2.** Establish a system for encouraging higher education institutions in Croatia to participate in joint study programmes. Secure additional funds for mobility of students and teaching staff (apart from ERASMUS+), in particular through the ESF (specifically, through the Operational Programme 'Efficient Human Resources 2014–2020'). Include them in programme agreements.

COMPETENT BODY: MSES

IMPLEMENTATION: National Council for Science and Higher Education, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Level of mobility through joint study programmes.
Level of implementation of the system. Level of additional funding.

- **MEASURE 7.3.3.** Develop study programmes in cooperation with foreign partners through joint study programmes. Begin the implementation of joint study programmes.

COMPETENT BODY: National Council for Science and Higher Education

IMPLEMENTATION: Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions

INDICATORS: Number of joint study programmes including higher education institutions from Croatia



7.4. INCREASING THE NUMBER OF FOREIGN ACADEMIC STAFF AT HIGHER EDUCATION INSTITUTIONS

The quality of higher education depends largely on the quality of teaching staff. The higher education system should therefore strive to ensure the best available teaching staff, not only limiting itself to human resources available in Croatia. In the current system, teaching staff are usually recruited among teaching assistants at a relevant higher education institution, i.e. from a very limited pool of potential candidates. This type of selection does not encourage competition or individual excellence of early-stage researchers in associate grades. In addition, they are not encouraged to compare themselves with early-stage researchers in a wider scientific community. Based on good practices from other higher education systems, the employment of teaching staff in Croatia should gradually develop an international dimension. Higher education institutions should have transparent selection procedures for new teaching staff and should secure the best teaching staff for their students, irrespective of their country of origin. This trend should be integrated into the strategic guidelines of Croatian higher education institutions in order to reach at least three per cent of foreign teaching staff by 2025. At the same time, hiring foreign teaching staff should not be an administrative measure that discriminates Croatian teaching staff, but only aimed at increasing the quality of teaching.

- **MEASURE 7.4.1.** Develop a strategy for hiring foreign teaching staff at higher education institutions. A Human Resources Plan should be updated annually, stating a realistic percentage of foreign teaching staff to be reached at each higher education institution by 2025, as well as an approximate roadmap for its implementation.

The Plan should also define work posts for foreign teaching staff.
COMPETENT BODY: Rectors' Conference IMPLEMENTATION: Universities

INDICATORS: Strategies are developed and adopted. Assessment of the extent to which strategies are implemented and plans are updated.

OBJECTIVE 8: FURTHER DEVELOP A CULTURE OF QUALITY AND ACCOUNTABILITY IN HIGHER EDUCATION



HIGHER
EDUCATION

The current legislative framework and other relevant documents in Croatia provide a relatively solid basis for establishing and promoting a quality culture in science and higher education.¹³² The further improvement of quality will, however, require some additional amendments. At the same time, all stakeholders within the system are expected to note that many factors influence the development of a quality culture, including: European and national frameworks for quality assurance;^{133,134} institutions in the area of higher education that promote, cultivate and respect the principles of quality; and all individuals included into the higher education system (teaching staff, scientists, administrative staff, etc.). The development of a quality culture will be a national, institutional and individual priority in the following strategic period.

8.1. ENCOURAGING THE AUTONOMY OF HIGHER EDUCATION INSTITUTIONS IN DEVELOPING THEIR PROFILE AND THEIR QUALITY CULTURE, WHILE ASSUMING ACCOUNTABILITY FOR QUALITY ASSURANCE AND FOR ACHIEVING THE STRATEGIC OBJECTIVES OF THE INSTITUTION

The responsibility for developing a quality culture will be assumed by higher education institutions in the framework of their autonomy, which should create an optimal balance between autonomy and accountability. Higher education institutions will develop institutional strategies as one of the preconditions in the process of quality assurance and accreditation. Programmes for developing a quality policy should be included in programme agreements.

- **MEASURE 8.1.1.** Prepare and implement project(s) and promotional activities in order to raise awareness of the importance of a quality culture and to promote academic values and the harmonisation of quality assurance procedures with strategic objectives
COMPETENT BODY: MSES
IMPLEMENTATION: MSES, Agency for Science and Higher Education, Croatian Employment Service (providing project funds), higher education institutions (application, implementation and co-funding projects)
INDICATORS: Number of completed projects/promotional activities. Level of awareness about the importance of a quality culture, about academic values and about the harmonisation of quality assurance procedures with strategic objectives.

8.2. DEVELOPING AN INTEGRATED HIGHER EDUCATION FUNDING SYSTEM THAT TAKES INTO ACCOUNT NATIONAL PRIORITIES AND LINKS THEM TO QUALITY ASSURANCE AND TO THE ACHIEVEMENT OF STRATEGIC GOALS OF HIGHER EDUCATION INSTITUTIONS

A link will be made between the results of quality assessment and the funding of higher education institutions through programme agreements.

- **MEASURE 8.2.1.** Introduce funding of higher education institutions through programme agreements.
This measure has been elaborated in detail under 'Objective 4: Develop an efficient higher education system that stimulates development' (see 'Measure 4.1.1. Develop and implement a funding model based on programme agreements').
- **MEASURE 8.2.2.** Systematic monitoring of the implementation of programme agreements
COMPETENT BODY: MSES
IMPLEMENTATION: MSES, Agency for Science and Higher Education, Rectors' Conference, Council of Polytechnics and Schools of Professional Higher Education, higher education institutions
INDICATORS: Level of implementation of programme agreements. Quality of the monitoring process. Level of users' satisfaction.

8.3. AMENDING THE CURRENT NORMATIVE FRAMEWORK

There is a need to amend existing documents related to quality assurance systems in higher education, in particular for developing criteria for the area of scientific research activity and administrative services. In addition, it is necessary to establish equal minimum criteria for the operation of universities, polytechnics and schools of professional higher education (e.g. teaching staff–student ratio, covering the teaching workload within a given study programme without relying on teaching staff from outside the higher education institution). It is also necessary to establish equal minimum criteria for the operation of public and private research institutes. To this end, it is necessary to revise the ordinance regulating the conditions for obtaining an accreditation for scientific activity, the conditions for the re-accreditation of scientific organisations and for content of letters of accreditation, as well as the ordinance on the contents of letters of accreditation and on the conditions for obtaining accreditation for higher education activities, for implementing study programmes and for the re-accreditation of higher education institutions.¹³⁵

- **MEASURE 8.3.1.** Standardise minimum criteria for the operation of all higher education institutions or scientific organisations, regardless of their type (universities, polytechnics and schools of professional higher education; public or private scientific organisations). To this end, when adopting criteria for the rate of partici-





pation of full-time teaching staff in teaching activities, the specific characteristics of professional study programmes should be taken into account. These amendments should be regulated through an ordinance that should also regulate possible additional and specific minimal criteria depending on the type of programme or research provided by an institution (undergraduate, graduate, integrated undergraduate and graduate study programmes; university or professional studies; basic or applied research, etc.).

COMPETENT BODY: MSES

IMPLEMENTATION: Agency for Science and Higher Education

INDICATORS: Regulations prepared and adopted

- **MEASURE 8.3.2.** Develop a procedure for the accreditation of joint national or international study programmes
COMPETENT BODY: MSES
IMPLEMENTATION: Agency for Science and Higher Education
INDICATORS: Regulations prepared and adopted regulating the procedure of accreditation of joint national or international study programmes

8.4. RATIONALISATION OF EVALUATION PROCEDURES

The Act on Quality Assurance in Science and Higher Education defines the following evaluation procedures: a) initial accreditation; b) re-accreditation; c) thematic evaluation, and d) external independent periodic assessment of the internal quality assurance system. Continuous monitoring of institutions will be introduced following initial accreditation, since it has been noted that in the period between initial accreditation and re-accreditation there are significant undesirable occurrences, such as the failure to comply with minimal criteria for implementing study programmes or scientific activity. The first cycle of re-accreditation of higher education institutions will be completed in the academic year 2015/2016. Following this first cycle, results will be analysed and used for developing a proposal to make evaluation procedures more efficient.”

- **MEASURE 8.4.1.** Prepare an integral analysis of completed procedures for the re- accreditation of higher education institutions and of the procedures for external evaluation of quality assurance systems, as well as an efficient plan for the second cycle of evaluation of institutions (based on the results of the first cycle of evaluations)
COMPETENT BODY: Agency for Science and Higher Education
IMPLEMENTATION: Accreditation Council
INDICATORS: Integral analysis prepared and published on the completed procedures for re- accreditation. Level of implementation of the plan. Level of usage of the results of the analysis for the purpose of implementing plans.

- **MEASURE 8.4.2.** Continuous monitoring of institutions in the period between two evaluations, i.e. following initial accreditation
COMPETENT BODY: Agency for Science and Higher Education
IMPLEMENTATION: Accreditation Council
INDICATORS: Level of implementation of permanent monitoring.

8.5. POVEZATI POSTOJEĆE INFORMACIJSKE SUSTAVE U VISOKOM OBRAZOVANJU I ZNANOSTI KAKO BI BILI INTEROPERABILNI I SLUŽILI PRIKUPLJANJU I ANALIZI PODATAKA TE KAO PODLOGA ZA INFORMIRANE ODLUKE.

Several information systems have been established in the area of science and higher education for the purpose of collecting, storing and analysing data. A major shortfall of the current systems is that they do not communicate, i.e. there is no exchange of data. It is essential to ensure that the existing information system is upgraded in order to enable data exchange, analysis and preparation of proposals for informed and strategic decision-making.

- **MEASURE 8.5.1.** Upgrade and link existing information systems in the area of science and higher education into a unique system.
This measure has been elaborated in detail under 'Objective 5: Secure appropriate premises and information and communication technologies infrastructure for higher education institutions' (5.2).





ADULT EDUCATION

In many countries, adult education has been accepted as an important component of lifelong learning. For that reason, it is necessary to develop and carry out formal and non-formal education and training programmes and to provide various other forms of learning that are focused on achieving two main groups of aims:

- acquisition of transversal competences by an individual. Such competences include: initiative and entrepreneurship; learning how to learn; cultural expression; social engagement (e.g. volunteering; ecological, political and similar types of activism; adoption and application of democratic values and attitudes); parenting skills; creative and artistic evaluation and expression; and development of elementary economic, financial and media literacy;
- acquisition of knowledge and skills targeted at enabling employability and better adaptability, i.e. mobility on the labour market.

Some of the objectives, guidelines and measures concerning adult education also relate to formal programmes (including foreign language learning programmes) and especially non-formal programmes for people under 15 years of age.

In comparison to initial formal education, what is specific to adult education is that it is more strongly and directly connected to social policy, the needs and requirements of the labour market, economic development, demographic changes, etc. The importance of adult education and training is becoming greater due to the population ageing in Croatia and the European Union. It is also increasingly important because the existing educational structure is not adjusted to the labour market, nor to the expected new requirements for reducing unemployment.

A significant proportion of Croatian citizens have not completed primary education (62 092 citizens over 15 years of age according to the 2011 census) or have only partially completed primary education (283 867 citizens). Meanwhile, a total of 773 489 citizens have primary education as their highest educational attainment. Among the employed and unemployed working-age population, the greatest proportion have completed secondary (mostly vocational) education – over 1.9 million



citizens. In total, this represents a large number of people either without qualifications, with lower qualifications or with a generally low level of education, i.e. without the key competences for lifelong learning. This indicates a need to harmonise the supply of programmes for improving individuals' competence potential, and to constantly adjust them to the changing and ever more demanding needs of the economy and of society.

In Croatia, the degree of adaptability of the education system to the needs of the economy, as well as to the personal pursuits and abilities of individuals, is very low. In parallel with the change of the economic structure, the demands for knowledge and skills have changed. Although education programmes are changing, especially as far as private educational services are concerned, there is still no systematic monitoring or prompt adaptation to the present needs, let alone to the future needs of the economy. Most employers expect formal education to provide young people with the knowledge and the skills required by a workplace, and they do not consider themselves responsible for providing them with the practical knowledge needed for work. In such circumstances, an increasing number of individuals are gradually excluded from the labour market and a mismatch appears between labour supply and labour demand. This phenomenon is reflected in problems such as: unemployment of young people with qualifications that are not in demand on the labour market (or for which the demand is low); long-term unemployment of those who have lost their jobs; job vacancies that cannot be filled despite high unemployment rates; and investment obstacles due to the shortage of an appropriate workforce.

In order to achieve a much higher level of participation of adult citizens in education programmes, many activities will be implemented and measures taken to overcome the current structural, situational and psychological obstacles to the access and participation of citizens in education programmes. Besides financial reasons, the unsatisfactory level of citizen participation is partially a result of the current educational programmes and their quality. In this respect, the emphasis of this Strategy is on improving the quality and the relevance of available programmes, as well as on encouraging higher education institutions to participate more actively in adult education, especially through part-time study programmes in the STEM field and programmes that are not part of full-time studies. A key task of higher education institutions must be the systematic organisation of seminars, workshops and programmes for specialised training of higher educated experts. Such activities of higher education institutions are part of their third mission and are supported in strategic documents at the international level.

Access to high-quality adult education programmes will be enabled. Moreover, the current wide variety of programmes of formal and non-formal education will be structured and accredited, especially in areas concerning training. Regulations should be changed so that the Ministry of Science, Education and Sports would still accredit programmes, but in

accordance with the regulations concerning the implementation of the Croatian Qualifications Framework. This would result in equalising, and (if possible) standardising compulsory learning outcomes and criteria for the validation of qualifications (or of units of learning outcomes). A comprehensive adult education quality assurance system will be established, which will include additional elements and procedures along with the existing HKO/CROQF mechanisms. All programmes that meet the given adult education quality assurance requirements will be considered as formal programmes, and alongside these, there can also be other non-formal programmes. According to the CROQF Act, based on approved qualifications standards, programmes can be created by adult education institutions, which should make sure that a qualification title is in accordance with the programme content.

In part, the objectives, activities and measures concerning adult education present a continuation of the implemented or planned activities of the Strategy for Adult Education (2004) and the respective Action Plan.¹³⁶

Based on the analysis of the current conditions in Croatia and the European Union, four main objectives, along with measures for their implementation, have been defined:

- provide the preconditions for increased participation of adults in the processes of lifelong learning and education;
- improve and expand work-based learning, education, training and development;
- establish an adult education quality assurance system;
- improve the organisation, financing and management of adult education processes.

OBJECTIVE 1: PROVIDE THE PRECONDITIONS FOR INCREASED PARTICIPATION OF ADULTS IN THE PROCESSES OF LIFELONG LEARNING AND EDUCATION

According to the Labour Force Survey (2012), the percentage of the adult population (aged 25 to 64) participating in education and training activities in Croatia is unsatisfactorily low (2.4 per cent) in comparison to the average in EU-27 countries (9 per cent). In order to reach a satisfactory level of participation by 2020 (more than 5 per cent), it is necessary to carry out certain activities and measures that will enable adults to overcome current obstacles to access and participate in programmes of formal and non-formal education. The mentioned obstacles can be divided into three groups:

Structural obstacles—structural elements that contribute to reduced participation or non-participation of adults in lifelong learning pro-





grammes. What stands out in Croatia is the following: an uneven supply of contemporary, relevant, high-quality and attractive programmes at the regional level; the ineffective and inefficient provision of mutually similar programmes; overall inflexible implementation and organisation; and the lack of financial incentive for participants, organisers and implementers of adult education programmes. Moreover, there is poor coordination between the Ministry of Science, Education and Sports, the Agency for Vocational Education and Training and Adult Education, and with adult education institutions in the process of proposing and validating new requests for qualifications submitted by employers or adult education institutions.

Situational obstacles—elements resulting from an individual’s personal situation, such as their age, their level of education or their family situation, e.g. parenting, unfavourable financial situation, full-time employment, migration, etc.

Psychological obstacles—the personal experiences of individuals resulting in their possible resistance and unwillingness to participate in lifelong learning programmes. For some citizens, reasons include negative experiences in the education and school environments, a lack of self-confidence and self-esteem, as well as a feeling of social exclusion.

Along with increasing the participation of adults in education and training programmes, it would also be desirable to increase the participation of young people in various parallel forms of education and learning other than regular formal education.

The key preconditions for increasing participation in adult education programmes are increased economic activity and development. Adult education programmes are closely related to the labour market, meaning participants enrol in programmes with the hope to improve their employability. The motivation for participation in adult education can, of course, also be intrinsic, but during times of economic crisis and high unemployment, the key perspective after the successful completion of programmes is certainly employment. The current unsatisfactory level of participation in adult education is certainly related to the unfavourable economic situation and to financial reasons. However, it can also be a result of the level of development of the adult education system and of the currently available programmes and their quality.

Future development will not be focused on increasing capacities (the number of institutions and programmes) in regions where they are sufficient and where the percentage of educated citizens is relatively high. On the contrary, it will be focused primarily on organising adult education in rural and less developed areas of the country, and particularly in existing education institutions. There is an intent to improve the quality and the relevance of the existing array of programmes, to introduce financial support and other forms of relief for individuals and employers, and to

encourage higher education institutions to be better and more intensely engaged in adult education.

Processes and a coherent system of recognition of non-formally and informally acquired knowledge and skills will be established, as prescribed by the Croatian Qualifications Framework and by strategic documents of the EU. The achievement of that long-term objective should lead to greater mobility throughout the lifelong learning system.

Very diverse programmes are currently being implemented by teachers who are mainly experts in particular subject areas covered by the programmes, but are insufficiently trained in teaching methods. Such experts do have a rich experience in particular professions and are useful adult educators, but most of them need further training in adult teaching methods. However, a lack of adult teaching methods is also evident among trained teachers. Indeed, teacher trainees who wish to work in adult education institutions complete their training in accordance with regulations governing regular educational activities. They take exams in field-specific teaching methods with children and youth within the regular education system, and without special insight into the methods and approaches for adult education.

It is thus herewith proposed that primary education teachers should have to acquire additional knowledge in psychology and in teaching methods required to work with adults, which will be a criterion for their licensing. For teachers in other formal programmes, this would be a desirable form of in-service teacher training for the time being. The aim and purpose of this is to improve the competence and the teaching quality of adult educators, as well as to increase the motivation of adult learners to successfully complete programmes. It is proposed that a project be launched to define organisational, financial and content preconditions for establishing a system of continual professional development and licensing for all adult educators.

The establishment of centres of competence will be encouraged. Also, a network of existing laboratories, workshops and centres for practical training within particular fields, as well as centres for up-to-date technologies will be established. Considering the sufficiency of existing capacities, and in order to avoid investing in the construction of infrastructure, there will be a focus on sustainability when establishing new centres. Moreover, account will be taken regarding the necessary staff. Measures for attracting adult learners from throughout Croatia to these mentioned centres of competence will be used to encourage the mobility of adult learners.

It is proposed that priority occupational standards and qualifications standards are defined and developed, together with corresponding adult education programmes. Financial support for this should be ensured from the state budget, local budgets or EU funds. The objective is to train





sufficient human resources for professional, innovative and entrepreneurial behaviour related to the new areas of economic activity, i.e. up-to-date technologies and the development of innovative services. Such programmes should be defined based on the objectives stipulated in the following strategies: the future Strategy of Development of the Republic of Croatia, the Strategy of Regional Development, the Strategy for Smart Specialisation, the Strategy of Entrepreneurship Development in the Republic of Croatia 2013–2020, the Industrial Strategy and the development strategies of particular sectors. Initially, the programmes could be related to sectors such as: health and hunting tourism; care of the elderly; organic food production and the green economy; use of renewable energy sources and the development of related equipment; application of information and communication technologies; cultural/creative industry; acquisition of competences and technologies for environmental protection; and recycling and maintaining biodiversity. Based on public tenders for such programmes, accredited institutions would be chosen, which would then be responsible for programme development and implementation.

In order to effectively remove structural, situational and psychological obstacles, it is necessary to contribute in raising the general awareness of the need for constant learning, education and the flexible changing of qualifications and occupations by acquiring new knowledge and skills. Citizens and employers should be encouraged in different ways, as well as be financially or otherwise motivated. Furthermore, positive examples should be used to emphasise the need for, and the profitability of, investing in the development, renewal and upgrading of the key competences for lifelong learning.

Participation in adult education processes will also be encouraged for people with lower levels of education, unemployed people, socially and otherwise marginalised people, elderly people, immigrants, and especially unemployed young people and those whose competences and qualifications are not in demand on the labour market (and will likely not be required in the foreseeable future).

User-oriented processes for informing and advising end-users about the possibilities of lifelong learning and education will be improved, particularly by means of an integral web portal, expansion of already established promotional activities (e.g. the Lifelong Learning Week or the International Literacy Day) and organising new public events and other means of media presentations of the programmes.

With a more intense and wider introduction of new tools for distance learning, along with open and free access to existing and new digital knowledge resources and educational tools, the processes of educating and training adults will become more rational, better and faster.

The first group of measures is focused on providing structural preconditions for increased participation by:

- improving the quality and the relevance of adult education programmes;
- building a coherent, high-quality and adaptable system of lifelong learning for professionals in early childhood and pre-school education, teachers, school principals, counsellors, coaches and mentors;
- encouraging the introduction of validation and recognition of non-formal and informal adult learning.

- **MEASURE 1.1.1.** Introduce new occupational and qualifications standards, and encourage the development and implementation of relevant and new accredited programmes in the fields of strategic interest for the development of Croatia.

Develop and implement relevant and new accredited programmes in the fields of strategic interest for the development of Croatia.

COMPETENT BODY: Ministries, state agencies, employment offices, secondary schools, adult education institutions, higher education institutions

IMPLEMENTATION: Employment offices, secondary schools, adult education institutions, higher education institutions

INDICATORS: Number of accredited and introduced programmes and number of adult learners. Amount of financial investment in the development of programmes.

- **MEASURE 1.1.2.** Continually evaluate and define occupational and qualifications standards and adapt them to the social, economic, cultural and artistic needs of individuals and the community.

COMPETENT BODY: Ministries, state agencies, employment offices, adult education institutions

IMPLEMENTATION: Employment offices, adult education institutions

INDICATORS: Percentage of evaluated and adapted occupational and qualifications standards. Number of new occupational and qualifications standards. Level of meeting particular social, economic, cultural and artistic needs of individuals and the community.

- **MEASURE 1.1.3.** Define the system of lifelong professional development and the licensing of adult educators.

Develop qualifications standards for adult educators. **COMPETENT BODY:** MSES

IMPLEMENTATION: Project-based (including higher education institutions, agencies responsible for adult education, professional adult education associations). Possible ESF funding.

INDICATORS: Conditions and procedures of licensing, programmes for additional education of adult educators. Number of developed qualifications standards for adult educators.





- **MEASURE 1.1.4.** Define and implement programmes for additional lifelong education and training of current and future professionals in early childhood and pre-school education, teachers and other education professionals (counsellors, mentors and coaches) in the fields of psychology, didactics, teaching methods, adult education and professional development.

COMPETENT BODY: MSES, agencies responsible for education

IMPLEMENTATION: Adult education institutions, higher education institutions, professional adult education associations. Possible ESF funding.

INDICATORS: Adult Education Act and related regulations amended. Number of programmes. Number of programme participants. Percentage of early childhood and pre-school education professionals, teachers and other education professionals involved in the programmes. Levels of acquired learning outcomes and competences of programme participants.

- **MEASURE 1.1.5.** Develop a project that would define the processes and the system of validation of prior non-formal and informal knowledge and skills in adult education.

Encourage the validation of prior knowledge and skills in adult education. COMPETENT BODY: MSES, state agencies responsible for education

IMPLEMENTATION: Possible ESF project funding. Implementation financed from the state budget.

IMPLEMENTATION: Permanent

INDICATORS: Project approved and financed. Preparation and approval of an ordinance on the validation of prior non-formal knowledge and skills in adult education. Number of citizens with recognised non-formally acquired knowledge and skills. Number of internationally recognised certificates. Level of citizen satisfaction.

- **MEASURE 1.1.6.** Analyse the existing resources of laboratories, workshops and education centres for particular groups or types of programmes.

Use project funding for development of regional and national centres of competence and their networks (exclusively using the capacities of existing facilities), and do so in collaboration with the business sector, regional and local self-government, and education institutions.

The centres should be places for the acquisition of practical experience, verification and certification of knowledge, skills and competences of teachers, mentors, coaches and participants in adult education and vocational training.

Define the terms of collaboration between the centres and the use of resources, as well as define the processes of implementation of programmes for various users.

Note: The measure correlates with the realisation of sub-measure 7.1. Establishing the optimal network of education institutions, the

relevant measures for secondary vocational education and training, and higher education.

COMPETENT BODY: National Council for Development of Human Potential

IMPLEMENTATION: Project-based (including adult education institutions, secondary vocational schools, higher education institutions)

Possible ESF project funding. Implementation financed from the state budget.

INDICATORS: Study prepared on the state of resources for the acquisition of practical knowledge and skills. Number of verified and financed projects for the establishment of centres and networks.

- **MEASURE 1.1.7.** Develop the terms and the criteria of participation, as well as the models of financial incentives and reliefs for partial employment of unemployed highly educated and/or professionally experienced citizens - as teachers, mentors or coaches in adult education institutions. In this way, the capacity and the competence of teaching resources, as well as social inclusion (especially of elderly citizens) would be increased.

Monitor the effects of inclusion of new service providers.

COMPETENT BODY: National Council for Development of Human Potential, line ministries

IMPLEMENTATION: Agencies, employment offices, adult education institutions IMPLEMENTATION: Permanent

INDICATORS: Terms, criteria and models approved. Number of newly included, previously unemployed teachers, mentors and coaches.

- **MEASURE 1.1.8.** Develop and apply computer and expert systems and content for adult e- teaching.

Organise the creation of open educational content and teaching aids with the possibility of free access, and encourage their use.

COMPETENT BODY: Line ministries, state agencies

IMPLEMENTATION: Projects (CARNET, SRCE, adult education institutions, higher education institutions and employers). Possible funding from the ESF and the state budget.

INDICATORS: Number of newly developed e-systems. Amount of content installed in knowledge bases. Number of users of the systems and a level of satisfaction with the effects of such forms of teaching.

Another group of measures should foster greater inclusion of citizens in various forms of acquisition of up-to-date non-vocational competences and required qualifications. For particular target groups - such as citizens with lower levels of education, unemployed youth, parents, the marginalised and socially excluded, persons with disabilities, elderly people and immigrants - specific programmes will be created and/or adapted.





- **MEASURE 1.2.1.** Encourage the implementation of formal and non-formal education programmes, which would include the development of economic and financial literacy, parenting skills, civic, cultural, political and ecological awareness, consumer and media literacy. Foster and develop creativity, artistic and cultural expression.
COMPETENT BODY: Line ministries, National Foundation for Civil Society Development
IMPLEMENTATION: Adult education institutions, cultural and artistic institutions, civil society organisations, professional adult education associations
INDICATORS: Number of incentive measures for programme implementation. Number of programme participants. Education and learning outcomes compared to the current state.
- **MEASURE 1.2.2.** Create and implement priority programmes of formal and non-formal education for citizens without primary education or with lower levels of education, socially marginalised and excluded citizens, persons with disabilities, elderly people and immigrants.
COMPETENT BODY: National Council for Development of Human Potential, local self- government, Croatian Employment Service, line ministries, the agency responsible for adult education
IMPLEMENTATION: Adult education institutions, cultural and artistic institutions, civil society organisations, professional adult education associations
INDICATORS: Number of programmes. Number of programme participants. Education and learning outcomes compared to the current state - surveys and research on the opinions of adult learners.
- **MEASURE 1.2.3.** Motivate and financially stimulate people with lower levels of education and qualifications, socially marginalised and excluded people, persons with disabilities, elderly people and immigrants to participate in adult education.
Inform on and promote the possible ways of accessing education for those groups of citizens through the media.
COMPETENT BODY: Ministries and agencies, local government bodies
IMPLEMENTATION: Adult education institutions, employment offices, public media
INDICATORS: Percentage of citizens without primary education or with lower levels of education, socially marginalised citizens, persons with disabilities, elderly people and immigrants taking part in the programmes. Amount of financial incentive per participant.
- **MEASURE 1.2.4.** Financially encourage, develop and implement adult education programmes in smaller towns, undeveloped and rural areas.
COMPETENT BODY: Ministries and agencies, local government bod-

ies **IMPLEMENTATION:** Adult education institutions
INDICATORS: Number of implemented programmes and number of adult learners. Amount of financial investment. Number of employed out of the total number of participants.

- **MEASURE 1.2.5.** Provide free primary adult education. Particularly encourage the elderly to complete primary education.

COMPETENT BODY: MSES

IMPLEMENTATION: Adult education institutions

Financed from the state budget and possibly from the ESF.

INDICATORS: Percentage of adults with completed primary education. Number of adult learners. Amount of financial investment.

Evaluated learning outcomes.

- **MEASURE 1.2.6.** Financially encourage the participation of unemployed people in formal education programmes that lead to the acquisition of an elementary education qualification, a higher level of a qualification, or a qualification different from the one already acquired.

The particular target groups are: unemployed young people with completed grammar school (gymnasium) education, and those with secondary vocational or higher education qualifications that are not in demand on the labour market.

COMPETENT BODY: Croatian Employment Service, ministries

IMPLEMENTATION: Adult education institutions

Financed from the state budget and possibly from the ESF.

INDICATORS: Percentage of unemployed citizens who participate in the programmes. Assessed learning outcomes. Number of employed out of the total number of participants.

Amount of financial investment.

The third group of measures is focused on overcoming psychological and situational obstacles for greater participation of citizens in programmes. These measures include:

- raising awareness of the necessity to invest in human resources and to foster motivation among citizens for lifelong learning;
- developing effective and user-oriented processes for informing and advising citizens about the possibilities of adult education;
- fostering mobility in adult education.

- **MEASURE 1.3.1.** Expand and improve existing events that contribute to the promotion of lifelong learning and education, and introduce new forms and means of promotional activity
- COMPETENT BODY:** Agencies

IMPLEMENTATION: Adult education institutions, employment offices, civil society organisations, vocational associations

INDICATORS: Changed perception from target groups about education and learning. Number of realised promotional activities and media presentations.





- **MEASURE 1.3.2.** Develop new and specific counselling processes at all levels of education and employment.
Expand places and offices for counselling and career guidance and network them.
Establish counselling centres and offices that would be appropriately distributed throughout the regions and easily accessible for all citizens, especially for the youth.
COMPETENT BODY: Employment offices, agencies, line ministries, higher education institutions
IMPLEMENTATION: Projects (Croatian Employment Service, agencies, schools, higher education institutions)
IMPLEMENTATION AND MAINTENANCE: Agencies, adult education institutions, employment offices, line ministries, higher education institutions
Possible funding from the ESF and/or the state budget.
INDICATORS: Number of newly developed and applied guides, ability and potential assessment tests, websites for counselling and guidance. Levels of process use and user satisfaction. Number of newly opened places providing information, counselling and guidance. Level of networking and regional coverage. Percentage of citizens/youth using the services and level of satisfaction with the services.
- **MJERA 1.3.3.** Improve the structure, accuracy and possibilities for users of the existing Common Andragogical Data Register (AZUP — Andragoški upisnik podataka) of the Agency for Vocational Education and Training and Adult Education, and make it available to the public. Develop an integral web portal and mobile device applications providing information about adult education possibilities: programmes, institutions, counselling offices, conditions, financial incentives, outcomes, etc.
COMPETENT BODY: Agencies
IMPLEMENTATION: Project-based, possibly with funding from the ESF
IMPLEMENTATION AND MAINTENANCE: Agencies, adult education institutions, employment offices
INDICATORS: Number of institutions and programmes included in the information system in relation to their total number. Accuracy of the data in databases. Number of information system users.
- **MEASURE 1.3.4.** Develop projects aimed at increasing internal spatial mobility in adult education. Inform potential adult learners more about the possibilities of internal and international mobility. By means of various financial and other incentives, influence the increase in mobility of lifelong and adult learners within the country and on the international level, which should result in an acquisition of specialised knowledge and skills.
COMPETENT BODY: Agencies, employment offices
IMPLEMENTATION: Projects (agencies, adult education institutions, employment offices) Possible ESF funding.

INDICATORS: Number of mobility programmes and number of adult learners in the programmes.

OBJECTIVE 2: IMPROVE AND EXPAND WORK-BASED LEARNING, EDUCATION, TRAINING AND DEVELOPMENT

Employers and the public administration need to take greater account of the current state and of improvements of their human resources, and in that way meet the preconditions for constant competitive adjustments on the market and quality improvements of public services. Employers, especially larger ones, currently use various and even innovative methods of education at the workplace and from the workplace. However, the total amount of investment and the degree of inclusion are significantly below the EU average. The consequence is significantly reduced workforce flexibility, which does not positively contribute to the concept of flexicurity — a concept embedded into the strategic documents of the EU and in initiatives such as the Europe 2020 Strategy, Agenda for New Skills and Jobs and Common Principles of Flexicurity.

Initiatives by larger employers who have developed internal education capacities and materials, which they use to educate their own employees, will be aided by the accreditation of such programmes by means of the Croatian Qualifications Framework. The Ordinance on the HKO/CROQF Register prescribes who is responsible for implementing the accreditation. Employees will acquire credits through internal education programmes. Moreover, they will obtain transferable certificates of acquisition and/or evaluation of units of learning outcomes, which will positively contribute to the transparent development of human resources over the long term. Small and medium enterprises frequently lack the awareness of (and the defined needs for) new knowledge and skills, and also have insufficient financial ability to educate their employees. A system will be established to offer them contemporary training programmes for existing and new qualifications and occupations.

Through financial reliefs and other incentives, employers will be encouraged, but also obliged, to continually and deliberately train their employees for new occupations and to widen and improve their competences. Furthermore, a stronger influence of trade unions is expected in the processes and requirements related to adult education.

Organising high-quality workplace-based practical training with employers is an important element in supporting the entire education system, and is also extremely important for raising the degree of occupational competence in almost all occupations. This is especially true for vocational occupations, and particularly among them specific crafts that



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are acquired only through intensive apprenticeship programmes. Of importance in such circumstances are the employers' attitudes and their readiness to bring on young people for practical training, as well as to conduct workplace-based practical classes on their premises. Financial support and reliefs should encourage employers to train counsellors and mentors to lead pupils, students and trainees in practical training at the workplace.

In many secondary schools and higher education institutions, as well as in companies, modern and equipped laboratories, workshops and education centres exist, which are nowadays mostly meant for the needs of pupils and students attending programmes in those institutions. Such centres employ experienced personnel, who are ready to transmit knowledge and skills not only to pupils and students in regular education, but also to learners and teachers in lifelong learning programmes. Many of the existing centres have been certified by international organisations that issue certain certificates, affirmations and other types of verified documents. Since there is no overview and analysis of such capacities in particular fields in Croatia, such centres will be identified in related fields. They will be mutually networked, and experienced experts will be trained for education and certification activities. For fields deemed important for the economic development of Croatia, projects will be developed for forming new centres of competence.

Higher education institutions, professional associations, technology transfer centres, regional development centres and similar institutions have to develop and provide more accredited training programmes for new high-technology knowledge and skills.

- **MEASURE 2.1.** Develop specific priority education and training programmes for small and medium enterprises and for existing and potential entrepreneurs, by means of calls for programme proposals, based on agreed competences and learning outcomes. Announce a public call for programme proposals. The programmes should include defined competences and learning outcomes. Accredited implementers should offer education programmes to small and medium enterprises.

COMPETENT BODY: National Council for Development of Human Potential, employment offices, Croatian Chamber of Economy, Croatian Employers' Association

IMPLEMENTATION: For projects — agencies; adult education institutions; higher education institutions; Croatian Employment Service; Croatian Chamber of Economy; Croatian Chamber of Trades and Crafts; Croatian Employers' Association; South East European Centre for Entrepreneurial Learning (SEECEL), etc.

Possible funding from the ESF and by employers.

INDICATORS: Number of new programmes for small and medium enterprises and number of programmes for entrepreneurs. Number of adult learners in the programmes and amount of funding per

learner. Level of satisfaction of learners and employers.

- **MEASURE 2.2.** (related to MEASURE 1.1.6.) Define simpler conditions and procedures for fostering cooperation between adult education institutions, entrepreneurs and local government, with the aim of improving the conditions of teaching and practical training within adult education programmes.

Plan incentives for employers to train and encourage mentors to perform practical teaching.

In that respect, adapt existing regulations in the area of labour legislation and the Adult Education Act in order to enable undisturbed and legally performed adult teaching and practical training throughout Croatia.

COMPETENT BODY: Ministries, agencies, Croatian Employers Association, Croatian Chamber of Economy; changes in legislation

IMPLEMENTATION: Adult education institutions, Croatian Chamber of Economy, Croatian Chamber of Trades and Crafts, employers

INDICATORS: Defined measures, conditions and procedures of conducting practical teaching. Number of places for practical training. Total duration of practical classes.



OBJECTIVE 3: ESTABLISH AN ADULT EDUCATION QUALITY ASSURANCE SYSTEM

In adult education there is a difference between formal education programmes and non-formal education programmes, which are implemented by institutions registered for adult education, and for which there is no defined and implemented quality assurance system.

In a narrow sense, non-formal adult education includes organised learning processes focused on training adults for work, for various social activities and for personal development. In the broader sense, the term refers to organised learning activities aimed at the acquisition and improvement of competences for personal, social and professional use, but which is not verified by a public document. The number of institutions providing non-formal programmes has been growing steadily over the last decade. These programmes are being implemented without the possibility of checking their quality and without the consent of a competent institution. Additionally, no records of them are kept and they are not part of any quality assurance system. Such programmes are mainly focused on providing currently attractive additional knowledge and skills, but for commercial gain, and users are not thoroughly informed of the possibilities of verification of their acquired certificates and documents for employment purposes. For many of these short programmes, credits are granted in accordance with the decisions of vocational associations and chambers, but the primary purpose of such credits is for maintain-



ing formal records of participation in lifelong education. No one actually evaluates the usefulness and the outcomes of such processes.

Formal adult education programmes are those verified by the line ministry (Ministry of Science, Education and Sports). Verification is based on whether or not they: meet the criteria (the duration and the manner of implementation); meet the spatial, staffing and material requirements determined by the Ordinance (Articles 23–41); and whether or not they received a positive assessment from the Agency for Vocational Education and Training and Adult Education and have been examined by the Ministry of Science, Education and Sports. In formal adult education programmes there exists a basis for the development of a quality assurance system. Some of the problems and challenges that provide fundamentals and directions for the development of quality in adult education are the following:

- Institutions themselves create adult education programmes, whereas primary and secondary school programmes are adopted by the minister. Primary school programme content is not adapted for adult education. The programme is condensed, but it is not based on an estimation of necessary competences and the time needed for their acquisition. In fact, certain content and subjects are excluded from it entirely, so adult learners, despite meeting the formal prerequisites, will have difficulty in continuing their education.
- The issued decrees for programmes have no expiration date (no re-accreditation).
- There is an obligation to keep records, but there are no sanctioning measures.
- There are no qualifications standards and units of learning outcomes that would set the minimum criteria and standardise the outcomes (Croatian Qualifications Framework).
- The criteria for issuing official opinions regarding programmes and conditions are not appropriately prescribed and developed.

Because of the stated shortcomings of the current adult education system, establishing a quality assurance system will be based on the following principles of the Croatian Qualifications Framework:

- creating education programmes based on learning outcomes and in line with the needs of the labour market by coordinating them with the related occupational standards and qualifications standards;
- establishing clear criteria and procedures of evaluation of qualifications standards and units of learning outcomes, and accrediting programmes and institutions in the Register of the Croatian Qualifications Framework.

Quality assurance in adult education will be implemented by competent agencies in accordance with the levels of the adult education programmes. Their work on quality assurance will be supplemented by the quality assurance of the acquisition of qualifications or units of learning outcomes, which until now has not been the case.

Adult education programmes for the acquisition of formal qualifications must enable adult learners to acquire learning outcomes prescribed by the relevant Qualification Standard in the Register of HKO/CROQF. Such programmes are proposed by education institutions, and must complete the procedure for initial accreditation (now verification), as well as periodic procedures for re-accreditation, as part of the quality assurance system. The agency responsible for adult education (currently the Agency for Vocational Education and Training and Adult Education) will conduct the initial evaluation of programmes at levels 2 to 5 of the HKO/CROQF, excluding short-cycle programmes in higher education. The Agency for Science and Higher Education will carry out procedures of evaluation of adult education programmes at levels 5 to 8 of the HKO/CROQF. Agencies give their opinions and recommendations on the programmes to the Ministry of Science, Education and Sports, and the Ministry makes a decision on their accreditation.

In order to establish a quality assurance system in adult education, it is necessary to:

- organise the institutional structure for the development and implementation of quality assurance, with a clear division of jurisdictions between the involved institutions;
- strengthen the functions of the competent agencies related to quality assurance, qualifications standards and the criteria and procedures of evaluation of adult education programmes and institutions;
- train institutions that implement formally accredited adult education programmes to implement internal quality assurance, in accordance with the HKO/CROQF Act.

- **MEASURE 3.1.1.** Conduct an analysis of the availability of adult education programmes and the efficiency of all stakeholders in the system in creating new programmes. Based on the assessed level in accordance with HKO/CROQF, regulate the jurisdictions of agencies in the assurance and development of programme quality, and the development of new adult education and professional training programmes.

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, agencies, higher education institutions

INDICATORS: Revised regulations that stipulate the jurisdictions in adult education quality assurance.

- **MEASURE 3.1.2.** Create and adopt procedures for agencies responsible for quality assurance of adult education programmes, considering the specifics of the levels and types of education.

COMPETENT BODY: MSES IMPLEMENTATION: MSES, agencies

INDICATORS: Revised regulations concerning the procedures of quality assurance of adult education programmes.





- **MEASURE 3.2.1.** Revise guidelines and instructions for creating adult education programmes and relevant qualifications standards, based on learning outcomes and aligned with relevant occupational standards, in accordance with HKO/CROQF and possible regulation changes.

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, agencies

INDICATORS: Adapted guidelines and instructions

- **MEASURE 3.2.2.** Develop improved curricula and programmes for primary and secondary adult education. Content should be adapted to adult learners and condensed on the basis of an assessment of the required key competences and the time needed for their acquisition, so that adult learners become qualified to enter the labour market, as well as continue their education.

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, agencies

INDICATORS: Prepared primary and secondary adult education programmes

- **MEASURE 3.2.3.** Improve the criteria and the implementation of efficient advisory assistance provided by agencies to education institutions in the process of accreditation and re-accreditation of adult education programmes

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, agencies

INDICATORS: Revised regulations in adult education. Level of preparedness of agencies.

- **MEASURE 3.2.4.** Establish a national adult education information system, which would contain information about programmes, adult learners, adult educators and the financing of accredited adult education programmes, which would also be connected to the Common Andragogical Data Register (AZUP), the Human Potential Register and the HKO/CROQF Register.

COMPETENT BODY: MSES, Agency for Vocational Education and Training and Adult Education

IMPLEMENTATION: Project-based (possible ESF funding) INDICATORS: Established national information system

- **MEASURE 3.2.5.** Collect information on the employability of the candidates who have completed accredited adult education programmes in line with the labour market, and use the information for an analysis of the efficiency of the programmes and for an analysis of the quality of the work performed by the institutions.

COMPETENT BODY: National Council for Development of Human Potential, agencies IMPLEMENTATION: Agencies, adult education institutions, employment offices

INDICATORS: Percentage of surveyed adult learners. Level of use of

the information on employability in the efficiency analysis.

- **MEASURE 3.3.1.** Develop the guidelines for the accreditation of internal quality assurance systems in accredited adult education institutions, following the example of the ESG guidelines (European Standards and Guidelines for Quality Assurance) in higher education.

Establish internal quality assurance systems in adult education institutions, which are subject to external evaluation performed by responsible agencies.

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, agencies, adult education institutions

INDICATORS: Prepared guidelines and level of operation of the system.



OBJECTIVE 4: IMPROVE THE ORGANISATION, FINANCING AND MANAGEMENT OF ADULT EDUCATION PROCESSES

The inefficiency of the adult education system, measured by extremely low participation, is partly the result of uncoordinated management processes between various line ministries, agencies, employment offices and other state and local institutions, and partly the result of insufficient financing or poor incentives provided by financial measures for learners, employers and other participants in the system. Incentives must be primarily focused on citizens for:

- the acquisition of primary education and key competences for lifelong learning;
- the acquisition of first, partial (additional) or other qualifications (retraining) focused on the needs of society and the economy.

Public calls and available resources will be used to encourage equipping and developing existing and, if reasonable, establishing new adult education institutions in smaller towns and rural areas. Public secondary schools, which currently implement a significant number of adult education programmes, should be used more in the development of a network of adult education institutions.

Agencies must monitor and consolidate information on accredited programmes, on all investments in adult education programmes, on initial accreditation and periodical re-accreditation of programmes and institutions, and on supervision in the quality assurance system. The results from the analyses of the data obtained will be used as a basis for the rationalisation of the number of institutions and the establishment of their network, as well as for the number and types of programmes and their development.



It is proposed that the capacities of the relevant authorities should be improved for the further development and implementation of adult education policy.

In accordance with their third mission, higher education institutions, especially universities, must take on new obligations concerning the organisation of lifelong learning and adult education, the creation and implementation of new programmes, teacher education for those programmes, the creation and implementation of part-time study programmes, career guidance and counselling, e-tools development, as well as the organisation and formation of open digital educational content, knowledge and tools. For that reason, the section of the Strategy related to higher education proposes the establishment of lifelong learning centres.

It is necessary to define what the priority adult education programmes are, specifically the priority qualifications to be obtained through those programmes, as well as to identify possibilities for financial support from public funds (state budget) or EU funds. Only adult learners who take part in programmes that are in demand on the labour market (or are important for foreseeable needs) will be co-financed. Planning and directing financial investments and incentives must be improved by means of better identifying proposed projects and by financing programmes of the highest importance for the community and for learners.

Although funding in Croatia for adult education projects and programmes has increased, it is still almost impossible to gain reliable insight on the total amount and structure of the expenditures — especially at the local and regional government and self-government levels. Considerable funds planned and set aside for adult education are not in the budget of the Ministry of Science, Education and Sports and/or the Agency for Vocational Education and Training and Adult Education, but are rather in the budgets of other ministries and bodies.

In Croatia, there are various sources for financing adult education, which is evident in the Adult Education Act, but the Act does not specify the obligations of particular financiers.

Measures should be planned to avoid disloyal competition between the providers of accredited adult education programmes, which can occur due to programme implementation in more privileged or less privileged conditions. For instance, in contrast to private providers, public providers use space and equipment mostly funded from public sources. Therefore, it is necessary to determine the commercial price for implementing such programmes — namely, a price below which programmes should not be provided.

The first group of activities needed for the realisation of the given objective is related to improving the coherence, organisation and management of adult education processes.

- MEASURE 4.1.1.** Define the procedures for analysing the indicators of implementation of the Strategy, decision-making, management and monitoring.
 Define the jurisdictions and the responsibilities of ministries, agencies, employment offices and other state and local institutions.
 Establish a department at the Ministry of Science, Education and Sports responsible for adult education.
COMPETENT BODY: Agencies, line ministries **IMPLEMENTATION:** Regular activity of agencies and line ministries. Act and ordinance amendments and their harmonisation.
INDICATORS: Approved activity schedules. Defined analysis procedures and jurisdictions. Level of operation of the department for adult education. Time required for accreditation and realisation of programmes. Number of newly accredited programmes. Expenditure of publicly invested funds per participant.
- MEASURE 4.1.2.** Define the procedures for coordination of state and non-state parties in the harmonisation and development of the adult education system. Involve a representative of civil society in the discussions on amendments to acts and regulations.
 Determine the criteria and the procedures for defining the adult education programmes of priority for economic and social development.
COMPETENT BODY: National Council for Development of Human Potential
IMPLEMENTATION: Ministries, offices of the Government of the Republic of Croatia, professional associations, national umbrella associations of NGOs
INDICATORS: Revised forms of partnership between state and non-state parties and the representatives of civil society in the adult education system.

Another group of measures is aimed at improving coordination in financing, and the managing and monitoring of expended funds between various line ministries and bodies.

- MEASURE 4.2.1.** Define the procedures of coordination in financing involving various line ministries, state and local government bodies.
 Identify programmes for financing, directubg funds from state and local budgets according to the priority criteria for the community.
 Coordinate the financing and the efficient use of funds.
COMPETENT BODY: Ministries and agencies **IMPLEMENTATION:** Regular activity of agencies and line ministries
INDICATORS: Amount of financial investment from various sources. Level of use of funds in relation to the plan. Level of coordination and fulfilment of priority criteria for the community.



- **MEASURE 4.2.2.** Propose indicators of implementation efficiency of the objectives of adult education programmes, for the purposes of monitoring and financial management.
Submission of annual reports by responsible state and local government bodies and adult education implementers, consolidated and methodologically arranged according to defined indicators, which should give insight into the number of adult learners, programmes, implementers and expenditure of funds.
COMPETENT BODY: Ministries and agencies
IMPLEMENTATION: Regular activity of agencies and line ministries; local government, agencies; adult education institutions
INDICATORS: Completeness of the reports and the quality of the defined indicators (extent of usability of obtained data). Number of adult learners. Expenditure of funds in relation to the effect.
- **MEASURE 4.2.4.** Harmonise and amend the regulations concerning the financial aspect of adult education activity. Define the tax policy regarding profit taxation, leading towards equality of adult education institutions regardless of their founder.
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: MSES, MoF
INDICATORS: Regulation amendments

With the aim of developing and choosing the optimal model of new financial incentives for participation in programmes for citizens and employers, the following measure is proposed:

- **MEASURE 4.3.1.** Propose an optimal model of financial encouragement for individuals and employers, based on an analysis of the possibility and legitimacy of introducing the following forms of financial incentives and reliefs:
 - models of personal education accounts and vouchers co-financed by the state or a local adult education community;
 - days off work for employees undergoing education;
 - tax reliefs for individuals for acquisition of key competences;
 - loans for adult education, in agreement with social partners;
 - establishment of the adult training and education fund.Introduce an optimal model of financial encouragement for individuals and employers, in accordance with the conducted analyses.
COMPETENT BODY: Ministries and agencies
IMPLEMENTATION: Adult education institutions, employment offices Amendments to the Act are necessary.
INDICATORS: Conducted analyses and a level of use of the obtained results. Level of operation of the models of financial incentive. Amount of financial incentive for adult learners. Level of use of the incentives. Number of new adult learners.



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SCIENCE AND TECHNOLOGY

Knowledge and the application of knowledge are the main conditions for the success of Croatia in today's world.¹³⁷ Science and technology are therefore strategically developed and aimed at placing education, research and innovation at the centre of the national development strategy, while at the same time taking into account the European Framework Programme for research and innovation Horizon 2020.¹³⁸ The main presumptions for reaching this goal are changes in Croatian science and changes that will improve science in Croatia. Croatian science needs changes and a structural transformation in order to maximally contribute to global knowledge, as well as contribute to social and economic development, job creation, and to improve quality of life and the general public good in Croatia.¹³⁹ Croatia ranks in the highest group of countries of very high human development by the Human Development Index (HDI), which is used by the United Nations Development Programme (UNDP) to measure quality of life, and it is within this group that it must progress.¹⁴⁰ The changes that will enable science to assume such a role demand a strengthening of the innovation economy and public services, as well as a gradual increase in funding for research and development towards three per cent of gross domestic product. Investment in research and innovation is an investment in Croatia's future, whereby it must be ensured that every Kuna invested contributes to the well-being of Croatian citizens as much as possible.

In all documents of the European Union, especially in the Strategy for Smart, Sustainable and Inclusive Growth Europe 2020,¹⁴¹ and its flagship initiatives Innovation Union¹⁴² and Digital Agenda for Europe,¹⁴³ as well as the Framework Programme Horizon 2020, research and innovation are brought together and the knowledge triangle between education, research and innovation is developed. This needs to be achieved in all Croatian strategic documents and an effective system of higher education, science and technology development needs to be built on this basis. The national priorities and national challenges must be defined and connected with those of Europe, and with an aim to achieve synergy in investing in science and technology from national, regional and international sources, including European Union funds.

In Croatia, the need for change was recognised on time. Although efforts have been made to enhance science and technology, especially over



the last ten years, the set goals have not been fully reached.^{144,145,146,147,148} Membership in the European Union has opened up new opportunities which cannot be exploited without rapidly introducing changes in the science and higher education system. The weaknesses of research and innovation, as well as the management of institutions in the science and higher education system, indicate a necessity for introducing changes – primarily on the basis of internationally accepted criteria for quality, relevance and rationality, as defined in the Guidelines for the Strategy for Education, Science and Technology.¹⁴⁹ Education, science, research, development and innovation in Croatia cannot be enhanced outside the framework of the knowledge triangle and without the introduction of changes in science, education and the economy (as well as changes in their mutual relationships), all of which requires that which has so far been lacking: political dedication; responsibility; continuity; and coordination.

Researchers are of fundamental value to the Croatian science and higher education system. Croatia's underutilised presumptions for development are networking, cooperation and synergy (along with a stronger linkage of the impact of science and art to society, education, technology and production), so that available human and material resources are fully exploited and new ones are created

OBJECTIVE 1: RAPIDLY INTRODUCE CHANGES IN THE SCIENCE AND HIGHER EDUCATION SYSTEM

CROATIA AND THE EUROPEAN RESEARCH AND INNOVATION CONTEXT

Science and technology development are taking place in globally modified circumstances, which are characterised by recession, the still dominant role of the USA and the growth of Asian and other new economies (which have been assuming an ever-greater role in science and technology on a global level). The European Union, faced with the need for transformation, has adopted the Europe 2020 strategy. The Framework Programme Horizon 2020, which is the key instrument for the implementation of the flagship initiative Innovation Union, defines priorities that include excellent science, industrial leadership and the following societal challenges: health, demographic changes and welfare; food safety, sustainable agriculture, sea and marine research and bio-economy; safe, clean and effective energy; smart, green and integrated transport; climate change, effective utilisation of resources and use of raw materials; inclusive, innovative and reflective society; and a secure society. Horizon 2020 is an inter-disciplinary, multi-disciplinary and trans-disciplinary research programme in which all societal challenges contain components from humanities and social sciences.

Excellent science comprises frontier research. This term reflects the new understanding of fundamental research. On the one hand, it is stated that fundamental research in science and technology is of crucial importance for economic and social welfare, while on the other hand, frontier research and research beyond borders is a risky enterprise directed towards new and especially challenging areas – its feature being the elimination of borders between disciplines.¹⁵⁰

European priorities link technology to research: Future and Emerging Technologies (FET) are linked to excellent science, whereas enabling and industrial technologies are linked to research for industrial leadership.

Furthermore, research and innovation are linked, with support from ideas to the market. The multi-annual financial framework and the resources from the European Structural and Investment Funds (ESIF) that are included in the Common Strategic Framework (CSF) serve the purpose of achieving the goals of the Europe 2020 strategy: the Cohesion Fund (CF), European Regional Development Fund (ERDF), European Social Fund (ESF), European Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF).¹⁵¹ 'The strengthening of research, technology development and innovation' is defined as the first thematic goal. Meanwhile, possibilities are opened up for everyone in a new way — to the young, scientists with great potential, outstanding researchers and innovators.

To increase investment in research and development in the period 2014–2020, in addition to its own funds, European funds will be available for Croatia, for which there are defined priorities and ex ante conditions that include defining a national strategy for research and innovation for smart specialisation.¹⁵² For Croatia, the thematic goal of 'strengthening research, technology development and innovation' is included in the priority area of investing in 'the strengthening of the competitiveness of the economy'.

CROATIAN KNOWLEDGE TRIANGLE

Croatia must develop its own national knowledge triangle, linked to European and global knowledge structures, by ensuring cooperation between the education, research and business sectors (especially industry). The Croatian Research and Higher Education Area will therefore be created, where public and private higher education and research institutions will operate, cooperating with the business sector and public services. This also opens up new opportunities for Croatian researchers, Croatian science, and for research and innovation in Croatia, and not just new requirements.

Regarding Croatia's membership in the European Union, there is a need to present Croatian humanities outside our borders with the aim of ensuring Croatia's presence and recognisability in a multinational union. On the other hand, there is an ongoing need to continually redefine





Croatian identity within Croatia. Continuous research on national and world cultural heritage and history is essential for societies that build their identities upon scientific results. Another essential factor in identity construction is awareness of Croatia's geographical features – its natural and cultural landscapes.

It is essential to introduce changes in the science and higher education system. The process of introducing changes will start immediately.

Research and innovation will be placed at the centre of the national development strategy, thus contributing to the understanding and general acceptance of their social and economic role and tasks, whereas the success of Croatian science will be evaluated not only through its contribution to global knowledge, but also through Croatia's social and economic development. What will therefore be taken into account are the tasks of higher education and science that go beyond the current and short-term needs of society and the economy, as well as the role of entrepreneurship in creating innovations.

Responsibility for research and development will be introduced in the programmes of all ministries, with effective inter-sectoral coordination. The utilisation of all state sources of public funding of research and development will be enhanced. Cooperation will be strengthened between public enterprises, community organisations and state institutions with universities and research institutes on research and development related to societal challenges. The European Union brings together all research and innovation programmes that have been implemented so far. This will be done by Croatia as well, and it will add programmes that have not yet been launched, but which serve as preconditions for the development of science and technology, as well as for social and economic progress.

The institutional framework for higher education, science and technology will be enhanced, parts of which have been well-defined. However, this framework has not been completed. It is insufficiently funded and in some areas it is only in the initial stage – namely in the area of strategic management of research, development and innovation. All four components of the institutional framework will be developed: strategic management through policy making, primarily within the Government's competence; distribution of public funds through institutional funding and competitive funding that is carried out by foundations and agencies; quality assurance and independent quality assessment; and research, development and innovation at universities and research institutes, as well as with the business sector and in public services. The roles, tasks and responsibilities of all competent bodies and institutions will be clearly defined and distributed during the course of implementation, and the autonomy and responsibility of the competent bodies and institutions will be strengthened, as will the national and international evaluation of their work.

The introduction of structural changes will start immediately, which will result in the transformation of larger public universities into research universities, the establishment of research centres at smaller universities and the restructuring of public research institutes (by incorporating them within universities, by setting up associations of institutes or by providing them with training to independently accomplish their mission and fulfil their social role).

ENHANCEMENT OF THE COLLECTION, PROCESSING, INTERPRETATION AND PUBLICATION OF STATISTICAL AND OTHER INDICATORS OF RESEARCH, DEVELOPMENT AND INNOVATION

The official statistics of Croatia contain basic statistical information on research, development and innovation, in accordance with the regulations of the Council of the European Union. Strategic planning, adequate policy making and preparation of action plans require credible and adequate indicators, as is the case for monitoring the impacts of strategic measures and the implementation of this Strategy.

Consequently, the collecting, processing, interpreting and publishing of statistical and other indicators resulting from research, development and innovation will be enhanced. In addition to the main indicators, additional indicators will be introduced that will provide detailed insight into investments in research and development, employment and human resources, as well as into productivity and competitiveness of research and development, in line with European good practice.¹⁵³

Indicators on the status and trends regarding investments in research and development in higher education and at research institutes are needed (state budget investments and their structure according to organisational and functional classification; structure of expenses; investment in competitive programmes and projects; gross domestic expenditure and sources of funding). Data is also needed on investment in research and development from the business sector (gross domestic expenditure by size and ownership of the enterprise and the economic sector; the share of public enterprises and community organisations; structure of expenses; sales, exports and employment on the basis of research and development; innovation activities by enterprise size and by the related income from new products and exports; and sources of funding of research, development and innovation). Data is also needed on human capital development (enrolment in and completion of undergraduate, graduate and doctoral study programmes, with a focus on natural sciences, technology, engineering and mathematics; first employment by economic sector; and number of researchers and structure by sectors). Finally, better data is needed on research, development and innovation activities (participation in EU programmes and amount of funding; cooperation between the business sector, public services, universities and research institutes; registered trademarks, patents pending and registered patents, licence agreements, scientific publications and citation). Statistical indicators





will cover high-technology industry and knowledge-based services in particular.

- **MEASURE 1.1.** Introduce responsibility for research and development and for competitive project funding into the programmes of all ministries, with effective inter-sectoral coordination that will result in the effective utilisation of all state sources of research and development funding

COMPETENT BODY: Government of the Republic of Croatia

IMPLEMENTATION: All ministries, local and regional self-government

INDICATORS: State budget: annual expenditure for research and development within the framework of the budget items of all ministries (amount, percentage of GDP). Annual expenditure for research and development by local and regional self-government (amount, percentage of GDP).

- **MEASURE 1.2.** Establish strategic management of higher education and science, and launch structural changes in the science and higher education system by means of research transformation of public universities and restructuring public institutes

COMPETENT BODY: NVZVO/NCSHE

IMPLEMENTATION: MSES, AZVO/ASHE, Rectors' Conference, public universities and public institutes

INDICATORS: Adopted action plan for structural changes in the science and higher education system

- **MEASURE 1.3.** Enhance the collecting, processing, interpreting and publishing of statistical and other indicators of research, development and innovation

COMPETENT BODY: Croatian Bureau of Statistics

IMPLEMENTATION: MSES, Ministry of Finance, HAMAG BICRO, AZVO/ASHE, State Intellectual Property Office, Croatian Bureau of Statistics — all in cooperation with public institutes and universities

INDICATORS: Level of compliance of data collecting, and of processing, interpreting and publishing statistical and other indicators of research, development and innovation with EU provisions, including the introduction of additional indicators, especially for research and development in the business sector, including high-technology industry and knowledge-based services. Publishing of annual statistical report of the Ministry of Science, Education and Sports containing comprehensive data on research, development and innovation in Croatia, including all indicators covered by this Strategy.

OBJECTIVE 2: FOSTER THE DEVELOPMENT OF INTERNATIONALLY COMPETITIVE PUBLIC UNIVERSITIES AND RESEARCH INSTITUTES IN THE CROATIAN HIGHER EDUCATION AND RESEARCH AREA TO CREATE NEW SCIENTIFIC, SOCIAL, CULTURAL AND ECONOMIC VALUES

RESEARCH IN THE PUBLIC SECTOR

The Croatian university system is comprised of seven public universities. Many young people opt to study natural, technical and biotechnical sciences, and the interest of female students in these fields is satisfactory – both of which are not the case in many European countries, but which are important for education in a knowledge society relying on technology.¹⁵⁴ This is a good starting point for various forms of networking between universities that are similar or complimentary in terms of space or programmes, and also for implementing joint study and research programmes. Moreover, the majority of public research institutes are situated in university centres (21 in Zagreb, one in Jastrebarsko, Osijek, Poreč and Split respectively), which facilitates the establishment of joint research teams, mobility of students and researchers, effective procurement and use of expensive research equipment. Higher education institutions and research institutes are located in cities offering social, cultural, artistic and economic activities, all of which facilitates various forms of cooperation. The Croatian Academic and Research Network has the basic information, communication and computing capacities to support cooperation in the Croatian and European education and research area. In addition to strengthening E-infrastructure, it will provide support to demanding programmes, both at the national level and within the framework of international cooperation.

Of the total number of researchers working full-time or part-time (11 454), almost 90 per cent are employed in higher education, public institutes and other parts of the state sector. Among those who are full-time researchers (6 487 in 2011), 80 per cent work in such institutions.¹⁵⁵

Before 2013, scientific projects funded from the state budget were characterised by fragmentation (more than 2 000 simultaneous projects), a disconnect between the funding of basic project costs and the funding of early-stage researchers and equipment, as well as a lack of implementation for systematic and actual evaluations of projects. By entrusting the Croatian Science Foundation with the implementation of the procedure for evaluating and monitoring national scientific projects, a major step has been made towards a science system with fewer, but well-funded scientific projects that will be properly monitored. The Croatian Science Foundation has thus become the main source of funding for scientific projects in Croatia.





According to the key indicators that are systematically used in the European Union, research achievements in Croatia are generally below the European average, but they are higher than those in several countries of the same economic structure.¹⁵⁶ Participation in European programmes is satisfactory, with 17 per cent of successful applications submitted by scientific and higher education institutions and 86 million Euros of utilised funds within the framework of the Seventh Framework Programme (FP7). Research conducted in the areas of health, information and communication technologies, biotechnology and transport has been particularly successful. Eighty small and medium-sized enterprises have been included in these projects. The indicators of scientific and technological excellence and cooperation are the following:¹⁵⁷

	Croatia	EU
Scientific publications among the 10percent of most cited in the world (percentage of all scientific publications)	3,2	11,0
Scientific publications published in cooperation with foreign researchers (per one million citizens)	428	343
Scientific publications published in cooperation with researchers from the private sector (per one million citizens)	5,2	7,3

The number of new doctorate graduates younger than 35 years of age is not much below the European average (Croatia with 1.4 and the EU with 1.7 doctorate graduates per one thousand citizens), but there is an insufficient number of them in natural science, technology, engineering and mathematical disciplines (around 40 per cent),¹⁵⁸ and very few doctorate graduates are employed in the business sector (estimated at 15 per cent).

These results have been obtained with public investments in research and development of only 0.41 per cent of GDP, which is much below the European average of 0.74 per cent of GDP (2011).

PUBLIC UNIVERSITIES AND PUBLIC RESEARCH INSTITUTES IN THE CROATIAN KNOWLEDGE TRIANGLE

At the beginning of the 21st century, all scientific areas were moving towards research teams and networks. The focus has been on moving from science disciplines towards research areas, and with partnership between the scientific and business communities. Knowledge is looked upon in the context of a triangle of education, research and innovation. Public universities are expected to contribute to the development of all components of the knowledge triangle, whereas public research institutes are expected to primarily contribute to research and innovation. New

knowledge and new ideas, as well as new processes, products, services and new entrepreneurship are all interrelated components of research production. This science and education model (which has multiple goals) is a feature of the developed world, where science and the economy on the one hand, and knowledge and entrepreneurship on the other, are mutually encouraged.

This is the course to be taken by public universities and public research institutes in Croatia, which presumes scientific excellence and cooperation between research and innovation on the one hand, and the economy and public services on the other, including participation in the processes in which knowledge-related resources are concentrated and connected with priority economic activities in which Croatia may become and remain competitive. The criteria for evaluating researchers, research and research institutions (along with the criteria for investing in research) will be aligned with these strategic principles.

Research and innovation at public universities and institutes will focus on excellent science (that is recognisable in the European and global context), as well as on research for industrial leadership and national and global societal challenges. Meanwhile, research in the public sector will scientifically, economically, socially and culturally impact Croatia. Excellence is required in all scientific disciplines, and must be based on fundamental research and participation in frontier research, future and emerging technologies, cooperation between research, public services and the economy (which includes enabling and industrial technologies), and research focused on national and global challenges, including societal and humanistic challenges. Research on characteristics of Croatian history, territorial identity, natural heritage, society and culture will be an important component of the research area. Culture is in the very centre of development, forming an important feature of societies and social groups. Therefore, special attention will be given to the systematic care and research of Croatian heritage and archival records, with a view to preserving the Croatian national identity in the process of globalisation.

Such strategic tasks of public universities and institutes require autonomy in managing, funding and researching, but this autonomy is inseparably linked to a responsibility in the creation and transfer of scientific achievements into society and the economy. Of particular relevance is respect for ethical principles in research and general principles that define the roles, responsibilities and obligations of researchers, their employers and financiers, as well as principles in recruiting researchers.^{159,160}

Public universities will be developed as research universities that will form the basis of a knowledge-based society and economy, and in which scientific education is based on research and cooperation that will allow for innovation.^{161,162,163} Research universities are institutions whose main purpose is to create new knowledge and to transfer this knowledge to society through its educational, research and social mission.¹⁶⁴ Research





universities are characterised by intellectual freedom, sense of initiative, creativity and openness. They are noted for their remarkably successful researchers and research groups at a high/international level, for their excellence in selecting students and teachers, for excellent doctoral study programmes established within doctoral schools, for students participating in research at undergraduate and graduate levels and for their impact on society and the economy. Research universities are characterised by their diversity, rather than by uniformity and similarity, and are also characterised by inter-disciplinarity, multi-disciplinarity, trans-disciplinarity and flexibility in conducting research, which is Croatia's aim as well.

Public institutes will develop programmes for continued research activities that will contribute to the national science, technology and innovation policy, and will conduct research for relevant state bodies. Their overall role will be defined in terms of societal needs and other system stakeholders, primarily in relation to the universities. The issue of restructuring public institutes has been open to debate for a long period, especially in terms of their efficiency and purposefulness. This issue is impossible to solve prior to defining every institute's social role and mission in the globally modified research and innovation context, including EU membership. Such an analysis will indicate their activities, expanded or redefined, and the need to include them in universities, to establish associations of institutes or to train their staff with the aim of enabling them to independently accomplish the mission and social role of public institutes.

The social role of public institutes in the area of natural, biomedical and biotechnological sciences includes programmes for continued research activities and the establishment and maintenance of a research infrastructure that ensures a strategic approach to new technologies. It also includes research programmes for the business sector that will contribute to the expansion, enhancement and diversification of the national economy, and participation in the state system of quality control and the aligning of products and services with EU legislation (ecology, food, materials, etc.). Institutes of social sciences and humanities fulfil their role by conducting research on the social changes that are relevant for the country's future and socially relevant forthcoming topics, by preparing scientific backgrounds for social reforms and by presenting critical reviews of policies and legal solutions. Furthermore, public institutes, along with public universities, take part in national and international research programmes and projects. By defining the mission of public institutes, their role and responsibility in society will be determined, thus enabling the targeting of resources needed for their work. In addition, the accomplishment of the defined mission will be the key element in assessing the work of the institutes.

RESEARCHERS AND RESEARCH GROUPS

Remarkably successful researchers and research groups are the main presumptions of international competitiveness and the national influence of universities and institutes — scientific, economic, social and cultural, the establishment of centres of research excellence, as well as the national, regional, European and global visibility of research in Croatia.

Croatian researchers have outstanding achievements in several scientific disciplines, and many researchers obtain quality and relevant research results that are aimed at strategic research priorities: excellent science, research for industrial leadership and societal challenges. Young researchers have a sense of initiative, and they are productive and ready to cooperate. This applies to a large number of active researchers, but not to everyone included in the science and higher education system.

Investment in researchers and research will be made from institutional and competitive sources.

The cost of basic research related to the scientific-educational or scientific workplace and the cost of related smaller equipment, as well as the cost of dissemination of research results of active researchers, will be included in earmarked institutional funding, which will assume the role of the current, mostly small-scale scientific projects and facilitate sustainable development of all scientific areas.

Investments from competitive resources will primarily be made through the Croatian Science Foundation, and together with additional investments from other foundations and institutional resources, they will be directed towards particularly successful scientists and research groups, talented young researchers, the establishment of new quality research groups and towards attracting excellent foreign researchers in those areas where research is to be undertaken or enhanced.

The centres of research excellence in Croatia will be established at the national level with the aim of achieving the following: critical mass and international visibility necessary for successful work; a well-defined research programme and integration in the European Research Area; a connection between science, industry and society; and a stable funding system that will not only depend on public investment.¹⁶⁵ The centres will not be related to a single location, institution or research group, as researchers and research resources will be gathered and networked through e-infrastructure in order to facilitate high-level research and development, and the centres will be measured by scientific production, research education and technological innovations.



DOCTORAL SCHOOLS AND POST-DOCTORAL EDUCATION



SCIENCE AND
TECHNOLOGY

Doctoral study programmes, as the main source for highly qualified researchers, are carried out by universities, with the inclusion of research resources of research institutes. The fundamental value of doctorates is proven by scientific excellence, scientific achievement and the original scientific contribution resulting from research. Their recognisability is based on published scientific papers and their impact on science. The added value of doctorates arises out of the potential impact of conducted research and achievements that can influence society, the economy and the development of creative thinking. There has been a change of the paradigm of 'a successful doctorate' towards 'a successful doctor of science'. A doctoral education acquired by a doctoral student for the labour market does not only include the scientific and educational component, but they also acquire education for both an academic and non-academic career, or for a career in research, or for another kind of career. In other words, doctoral students are trained on how to be scientists, how to live and work in the field of science (or related to science), and how to use this knowledge to build partnerships.

Quality doctoral education that creates these values requires strong research-oriented doctoral study programmes structured within the framework of doctoral schools. European universities, in accordance with the Salzburg Principles,^{166,167,168} have been establishing doctoral schools as a major step in transforming doctoral education. By 2010, 65 per cent of European universities had established doctoral schools,¹⁶⁹ so that today there is a structured form of doctoral education that is no longer theoretically discussed, but which is focused on quality assurance.¹⁷⁰ The importance of doctoral education and doctoral schools is of continuing interest to all EU Member States,¹⁷¹ Croatia¹⁷² and all neighbouring countries.¹⁷³

Doctoral schools aim to achieve the following: excellence in research; the possibility for interdisciplinary research; an attractive institutional environment; openness towards the economy and other services; international networking; the internationalisation of doctoral study programmes that includes foreign doctoral students and mentors; the acquisition of transversal skills; the professional development of researchers;¹⁷⁴ and quality assurance.

Since Croatia has had no experience with doctoral schools, and due to the fact that inter-disciplinarity, multi-disciplinarity and trans-disciplinarity in research are the greatest unexploited potential, doctoral schools will be established at the university level. The models at a lower level (such as faculty doctoral schools or local/regional doctoral schools) will not bring about necessary changes due to great fragmentation and a large number of doctoral study programmes (a total of 128 doctoral study programmes) – most of which include a small number of students. In addition, wherever it is possible, and especially in disciplines with smaller

research and mentorship capacities, national doctoral programmes and international joint doctoral study programmes will be set up. These joint study programmes are implemented through cooperation between universities and cooperation with institutes. A selection will be carried out in the enrolment procedure for doctoral study programmes, doctoral research will be connected with research projects and the best research groups, and post-doctoral education will be set up. Cooperation between research institutes will be established and the research and mentorship potential of research institutes will be exploited, as will be the research resources of the business sector and public services. Doctoral study programmes in arts will be developed on the basis of the same principles. No doctorates will be awarded outside of universities.

The best undergraduate and graduate students with research tendencies will be included in research groups and involved in performing appropriate research tasks in ongoing projects, all in accordance with the practices of research universities. They will therefore be motivated to enrol in doctoral study programmes and for a career in research at an early stage. At a research university students are not a 'burden', but rather a research potential that no other institution has. In other words, universities are not transformed into institutes to become research universities, but rather students are included in the research. This is the change of the educational paradigm from the currently prevailing 'research after learning' towards 'learning through research'.

The first indicator of understanding the transformation of research and the establishment of research universities will be the introduction of mentoring at all study levels and the introduction of doctoral education into the 'regular' teaching and research workload, as opposed to the current situation where mentorship and doctoral study programmes are a non-obligatory 'supplement' to lectures, practical classes and seminars in undergraduate and graduate study programmes.

EVALUATION OF RESEARCHERS, RESEARCH AND RESEARCH INSTITUTIONS

An evaluation system will be established that will encourage and ensure the recognition of scientific and artistic excellence, international visibility, mutual cooperation and cooperation with the benefactors of research results, as well as encourage and ensure the social and/or economic relevance of research. The evaluation will be based on three criteria: quality (excellence in research), relevance (in both the global and Croatian context) and rationality (efficiency and sustainability in terms of organisation and expenditure).

The criteria for evaluating researchers, research and research institutions will be aligned with the desired goals, which are scientific and artistic excellence, as well as cooperation between research and innovation with the economy and public services. Scientific excellence and its evaluation





are the first precondition so that the knowledge that already exists and is produced at Croatian public universities and institutes will be internationally competitive and will create new scientific, social, cultural or economic value. In order to enhance and encourage cooperation between research and innovation with the economy and public services, this will be included in the evaluation criteria, based on the requirements and expectations of scientific areas.

Evaluation criteria will be encouraging for successful researchers, as the criteria will reject unsuccessful researchers, research and research institutions, thus enabling the recognition of those that are excellent.

The value system of science and technology will be harmonised unconditionally and as quickly as possible with the value systems in scientifically and technologically developed countries. The manner of scientific selection and career advancement of university professors and researchers will be modified and peer review will be introduced. This will be done in accordance with criteria applied in scientifically developed countries, whereby independence, originality and innovation in research will be evaluated separately. Strict international quality assessment criteria will, along with all research achievements, also include the potential for the development of creative careers.

On the basis of tenders and international peer reviews, the position of research professor will be ensured. Research professors participate in excellent research and doctoral level education for most of their working time (due to a special distribution of working time).

RESEARCH INVESTMENT PLANNING

Croatian research priorities and their link with European priorities will be defined by the National Council for Science, Higher Education and Technological Development. This is the principal expert body concerned with the overall development and quality of scientific activity and the system of science, higher education and technology development.

National investment planning will, along with the evaluation of research achievements, be aligned with desired objectives, which are scientific excellence and cooperation between research and innovation with the economy and public services. It will be based on the same criteria: quality and relevance, as well as efficiency and sustainability in terms of organisation and expenditure. Major changes will be implemented in directing budget funds and competitive funding of research and development.

The directing of budget funds for research and development, including funds for competitive funding of research, will be implemented in accordance with the methodology applied by the European Union in the Framework Programme Horizon 2020,¹⁷⁵ taking into account the budget shares allocated to each priority: excellent science (around 32 per cent,

of which around 17 per cent will be allocated to research through the European Research Council (ERC), industrial leadership (around 22 per cent) and societal challenges (around 38 per cent). A total of 7 per cent of the funds are allocated to programmes for spreading excellence and strengthening participation, for integrating scientific and technological achievements into European society, and for the work of the European Institute of Innovation and Technology (EIT) and the Joint Research Centre of the European Commission (JRC).

Competitive funding through the Croatian Science Foundation will enable the funding of new doctoral students and post-doctoral researchers from project funds and through support programmes for future successful scientists, thus ensuring their inclusion in research programmes at universities, institutes, the economy and the public sector.

Science project competitions will combine open projects that encourage researchers to propose science-driven, bottom-up research with projects that encourage impact-driven, top-down research (whose outputs and project numbers have been defined beforehand). The competitions will include project support for international cooperation for research groups that have proven their research independence and have reached outstanding achievements in the priority areas of excellent science, frontier research or future and emerging technologies. An international evaluation of project applications will be carried out.

The tenders will be prepared and implemented in such a manner that they encourage the formation of, and enable the funding of quality research groups. Increased allocations need to be ensured from both budgetary and extra-budgetary resources, and excellence criteria that are comparable to those used in the European Research Area need to be systematically applied. The Croatian Science Foundation, as a body responsible for quality management in the science system, may prepare and implement tenders for the funds allocated from other sources, and not only through the Croatian Science Foundation.

- **MEASURE 2.1.** Define the research mission of each public university and its constituent units, and of each public institute as a condition for research transformation, and for the establishment of research universities and the restructuring of institutes
COMPETENT BODY: NVZVO/NCSHE
IMPLEMENTATION: MSES, AZVO/ASHE, public universities and public institutes
INDICATORS: Plan defined for research transformation of each public university. Social role and form of work of each public institute defined: inclusion in the university, association of institutes or independent work.
- **MEASURE 2.2.** Strengthen the autonomy of public universities and public institutes in terms of funding and management and





their responsibility regarding the fulfilment of their research mission and social role, along with strengthening the supervisory function of the founders through quality monitoring and the accomplishment of the mission. Enhance international evaluation of public universities and institutes, as well as set up mechanisms for the impact of evaluation results on institutional funding through programme agreements.

COMPETENT BODY: MSES

IMPLEMENTATION: MSES, AZVO/ASHE, public universities and public institutes

INDICATORS: Level of establishment of the system of institutional funding of overall activity through programme agreements, including salaries. Funds allocated for research and development in every public scientific and higher education institution (annual amount, increase and share). Earmarked funds for covering the basic costs of research in every public scientific and higher education institution (annual amount, increase and share). Percentage of funding that depends on obtained research results from the total amount of institutional funding sources.

- **MEASURE 2.3.** Set up a system of evaluating researchers, research and research institutions that will encourage and ensure the recognition of scientific excellence and international visibility, mutual cooperation, cooperation with the beneficiaries of research results and the societal relevance of research

COMPETENT BODY: NVZVO/NCSHE

IMPLEMENTATION: MSES, AZVO/ASHE, Rectors' Conference, universities and research institutes

INDICATORS: New system of evaluating researchers, research and research institutions established in 2015. Total number of scientific papers; number of scientific papers published in leading journals; number of scientific papers that are among 10 per cent of the most cited in the world¹⁷⁶; number of scientific papers published in co-authorship: with foreign researchers, researchers from different Croatian universities/institutes, from various scientific disciplines and with researchers from the economic field or public services. Number of patents, licences and other forms of intellectual property. Number of projects: international and national; cooperation between research and the economy and public services. Income from international projects, national projects; cooperation between research and the economy and public services, intellectual property.

- **MEASURE 2.4.** Introduce peer review in the procedures for scientific selection and for career advancement of university professors and researchers

COMPETENT BODY: NVZVO/NCSHE

IMPLEMENTATION: Rectors' Conference, universities and research institutes

INDICATORS: Level of establishment of the new system of scientific

selection and career advancement of university professors and researchers. Number of university professors and researchers evaluated according to the new system of scientific selection and career advancement (in total, by research occupations and scientific areas).

- **MEASURE 2.5.** Set up doctoral schools at the university level, international joint doctoral study programmes and national doctoral study programmes with at least 80 per cent of research based on current high-quality doctoral study programmes

COMPETENT BODY: Public universities

IMPLEMENTATION: Rectors' Conference, public universities, research institutes, AZVO/ASHE

INDICATORS: Doctoral education introduced in the criteria for evaluating universities. Doctoral schools set up. National doctoral programmes prepared. International joint doctoral programmes prepared.

- **MEASURE 2.6.** Enhance the preparation and implementation of national science projects, so that their content and achievements will contribute to the quality, relevance and rationality of research and the fulfilment of strategic goals

COMPETENT BODY: Croatian Science Foundation

IMPLEMENTATION: Croatian Science Foundation, universities and research institutes

INDICATORS: Tenders for scientific projects from the Croatian Science Foundation and their results (number and types of tenders, and for each tender: evaluation criteria, number and structure of submitted and approved projects/applications, amount of available and allotted funds). Total number of research groups, their structure, size and international recognisability, as well as international and national relatedness. Number of new research groups, their structure, size, international and national relatedness. Total number of foreign researchers and number of new foreign researchers in full-time employment. Total number of doctoral students and number of new doctoral students, compliance with the needs of the science and higher education system, the economy and public services, research achievements of doctoral students. Number of undergraduate and graduate students included in research.

- **MEASURE 2.7.** Set up national scientific centres of excellence that gather researchers and research resources and link them with European resources.

COMPETENT BODY: NVZVO/NCSHE

IMPLEMENTATION: MSES, AZVO/ASHE, universities and research institutes, through project proposals for centres of excellence for EU funding

INDICATORS: Project applications from centres of excellence for EU funding. Approved projects of centres of excellence for EU funding



and dynamics of constructing centres of excellence. Number of established centres of excellence. Level of inclusion of researchers and resources and level of linkage with European resources.



OBJECTIVE 3: CREATE AN ENVIRONMENT THAT FACILITATES AND ENCOURAGES INTERACTION AND TRANSFER MECHANISMS FOR COOPERATION BETWEEN THE RESEARCH COMMUNITY, THE INNOVATION ECONOMY AND PUBLIC SERVICES

RESEARCH, DEVELOPMENT AND INNOVATION IN THE CROATIAN ECONOMY

On 31 December 2012, almost 140 000 active business entities operated in Croatia. Out of this number, more than 80 per cent were private and almost 90 per cent had fewer than 10 employees. Small and medium-sized enterprises accounted for 10 per cent, whereas large enterprises with more than 500 employees accounted for no more than 0.2 per cent.¹⁷⁷

In relation to the size of the enterprise, the total expenditure of enterprises for research and development in Croatia in 2010, was distributed as follows:

- enterprises with one to nine employees accounted for 1.1 per cent;
- enterprises with 10 to 49 employees accounted for 6.6 per cent;
- enterprises with 50 to 249 employees accounted for 34.9 per cent; and
- enterprises with more than 250 employees accounted for 57.4 per cent of the expenditure.¹⁷⁸

The intensity of research and development with respect to the size of the business entities is similar to that of most smaller countries, where medium-sized and large business entities account for 60 per cent of investment in research and development. Large business entities dominate in industrially developed countries, where their share in investments in research and development is around 80 per cent, or even higher.

The high-technology sector (according to the statistical classification of economic activities) includes high-technology production and knowledge-intensive services, including research and experimental development in natural, technical and biotechnical sciences, as well as in social sciences and humanities.^{179,180} There are more than 800 enterprises registered for high-technology production, and around 4 500 enterprises are registered for knowledge-intensive services. The share of high-technology products in total production is unknown. High-technology product imports in 2009 amounted to 1.35 billion Euros, whereas exports amounted to 565 million Euros, whereby the imports exceed exports by 41.8 per cent.

A survey on a sample of 4 500 enterprises was carried out on innovation activities in enterprises in the period between 2008 and 2010. According to this survey, innovative enterprises are defined as enterprises that introduced a product, or introduced a process, organisational or marketing innovation in the reporting period.¹⁸¹ Among other things, the survey showed the following: ‘The size of the enterprise is the key factor for its innovation activities. Nearly three out of four large enterprises, a little more than half of medium-sized enterprises, and a little more than one third of small enterprises are innovative. Innovation activities are more common in industrial enterprises, where almost half of them introduced innovations, while a little less than one-third of service enterprises introduced innovations.’

Furthermore: ‘Innovation activities include all scientific, technological, organisational, financial and commercial steps undertaken with the purpose of introducing innovation. The acquisition of machinery, equipment and software is the most frequent type of innovation activities present among most of the product and process innovators (84.4 per cent), which is equally used by industrial and service enterprises. Industrial enterprises were more inclined to use in-house research and development activities and design activities, while service enterprises were more inclined to acquire external knowledge, such as licensing of patents and non-patented inventions, know-how and other types of knowledge.’

Investments in research, development and innovation are low in the business sector, and are primarily the result of investments made by several business entities. The most frequent innovation activity is ‘Acquisition of machinery, equipment and software’ (in 84 per cent of enterprises), followed by ‘In-house activities of research and development’ (in 63 per cent of enterprises). Regardless of their size, enterprises invest more than 90 per cent of their funds in innovation activities based on in-house research, development and infrastructure. Innovation activities based on some form of cooperation (i.e. ‘External services of research and development’ and ‘The acquisition of external knowledge’) amount to only five to ten per cent, depending on the enterprise size. The share of enterprises with at least one innovation type in Croatia is around 37per cent, compared to 52percent in the EU. According to EU benchmarks for assessing the innovation achievements of EU Member States, Croatia is classified in the group of ‘moderate innovators’.¹⁸²

There are no particular data on enterprises that are partially or wholly owned by foreigners and regarding their development and innovation activities. Therefore, the current situation and their potential in terms of strengthening research and innovation in Croatia cannot be assessed. Considering the chronic lack of experts and researchers in the technological sector in Europe, these enterprises should attract research and development business to Croatia to a greater extent than has been the case so far – namely in areas with existing highly qualified experts and researchers.



COOPERATION IN RESEARCH, DEVELOPMENT AND INNOVATION

Research, development and innovation in Croatia are characterised by a low level of cooperation. There is insufficient cooperation within the research community, the economy, the social sector and between each other. The above-mentioned indicator of scientific publications published jointly by researchers from the public and private sectors is below the European average.

In order to strengthen cooperation between the research and business sectors, changes are necessary on both sides, and in areas such as: development of research, development and innovation abilities and competitiveness of Croatian research institutions and the business sector (especially in industrial enterprises and industry). Moreover, a broader understanding of innovation is needed.

Cooperation between public universities, public institutes, the business sector and public services must incorporate interaction and transfer mechanisms contributing to interconnection and the exchange of knowledge.¹⁸³ All global experiences (and some of our own) indicate a special relevance of interaction mechanisms in establishing relationships during research, as well as their advantage over transfer mechanisms in establishing relationships upon the completion of research.

The interaction mechanism for achieving large-scale changes are joint research projects resulting from cooperation between public universities and institutes with the business or social sectors. The difference between research projects financed from public funds and joint research projects is not due to a different scientific approach, but rather because of a different focus on the selected research area and the relevance of achievements. Joint research projects conducted within the framework of a doctoral study programme are particularly relevant, since this type of doctoral research fully contributes to the research and innovation potential of the economy. In order for this to be additionally strengthened, innovative schemes of co-funding doctoral study programmes will be set up with the aim of strengthening cooperation with the business sector and solving the current societal challenges. These topics of doctoral research will be linked with contracted research programmes of cooperation between the economy (industry and other services) and public universities and institutes. The mission of so-called collaborative doctoral programmes and industrial or professional doctoral programmes will thus be fulfilled. The quality of doctoral research will be ensured by high academic standards, while their relevance will be ensured by their value to the economy, society and other services in the areas where research, business or institutional strategies overlap.

The mechanisms for transferring knowledge, technology, innovation and intellectual property from universities and institutes into the economy



will be strengthened, along with the mechanisms for commercialising research results – especially regarding the establishment of innovative enterprises and cooperation within joint organisations oriented towards new ideas, procedures, processes, prototypes or patents. Scientific excellence and technological expertise will thus become the catalysts of new industry in high technologies and knowledge-based industry. At the same time, the transfer of knowledge, technology and intellectual property will be open towards international cooperation and the international market.

By organizing communities of knowledge and innovation (the Knowledge and Innovation Community, or KIC), the European Union has demonstrated the need for new forms of connectivity. These communities are organised for activities focusing on certain societal challenges with a view to forming a strong partnership in the knowledge triangle (oriented towards innovation and innovation models), and the EU expects that these communities will become the catalysts of sustainable economic growth and competitiveness.^{184,185}

In order to strengthen cooperation, Croatia will opt to network research (universities, research institutes), higher education (universities, polytechnics, colleges) and development and industrial enterprises (large, medium-sized and small). A special reason for this networking is the structure of Croatia's economy, which is dominated by micro-, small and medium-sized enterprises that find it hard to organise the needed research resources themselves, which in turn negatively affects their innovation capacities. If we want to catch up with developed economies and cooperate with them, the development cycle of innovation models applied in different countries over the last 30 years should not be repeated. By using the best experiences from EU countries, competitiveness clusters will develop competence networks to facilitate close cooperation between stakeholders with different roles in the value chain (both within and between different sectors), as well as develop innovations of higher and high added value.

Societal challenges require appropriate social innovations that will create new social relationships and enable cooperation to offer solutions to societal challenges.¹⁸⁶ The connection of science, art, technology, organisation and marketing with new business models and business practice has a social and humanistic dimension. There is now room for cooperation in research, development and innovation, including in the following areas: ethics in science, research and development, bioethics, intellectual property rights, new forms of work, virtual teams and organisations, new communication patterns and social networking, multi-culturality, high-technology workplaces, cognitive foundations of programme engineering, networked families, family networking, etc. There is a great potential for social usability of humanistic knowledge. The cultural sector may become a catalyst for economic activities and, in connection with business (especially tourism), may contribute to overall economic development and employment. The same applies to art and creative industries.





Public universities and public institutes should not only be better connected with the business sector and public services, but also with the competent ministries and agencies. Public universities and public institutes should therefore not assume business functions and roles of enterprises.

The national strategy for fostering innovation will propose changes that will enable the transformation of the economy through innovation. Furthermore, it will propose a national innovation scheme that supports cooperation between innovation economy, public services and the research sector. Research and development focused on innovation is possible within the framework of regional cooperation.¹⁸⁷

- **MEASURE 3.1.** strengthen cooperation between public universities, public institutes, the business sector and public services, and especially research and development by means of joint projects, joint mentoring of doctoral and graduate students, funding of doctoral research and the establishment of enterprises based on research results. Develop mechanisms for transferring knowledge, technology, innovation and intellectual property into the economy, as well as mechanisms for transferring the need for technological solutions and requests for solving specific issues in industry, the economy and public services towards public universities and public institutes.

COMPETENT BODY: Government of the Republic of Croatia, HGK/CCE, HUP/CEA

IMPLEMENTATION: HZZ/CES, HAMAG BICRO, Croatian Bank for Reconstruction and Development, HGK/CCE, HUP/CEA, National Competitiveness Council, public universities and public institutes, alumni associations.

INDICATORS: Joint research projects between the business sector, public services, public universities and public institutes (number of projects, and for each project: composition of research team, number of researchers and amount of funds). Number of products and services developed through joint projects. Number of products and services developed through joint projects and placed on the market. Joint mentorship of a graduate and doctoral study programme (number of graduate and doctoral students). Doctoral research funded or co-funded by the business sector or public services (number of doctoral students, area of doctoral research, amount of funds). Number of spin-offs (start-ups), number of employed persons. Number of joint companies/organisations with the business sector, number of employed persons. Number of projects for transferring knowledge, procedures, processes, prototypes and intellectual property rights, and realised income. Income from licences. Number of patent applications and of approved patents. Number of commercialised patents and realised income.

- **MEASURE 3.2.** Strengthen cooperation between public enterprises, community organisations and state institutions with universi-

ties and research institutes on research and development related to societal challenges

COMPETENT BODY: Government of the Republic of Croatia, local and regional self-government

IMPLEMENTATION: HZZ/CES, HAMAG BICRO, local and regional self-government, universities and research institutes

INDICATORS: Expenditures for research and development of public enterprises (total amount, percentage of income, percentage of GDP). Joint research projects between public enterprises and universities and public institutes and the amount of funding (number of projects, amount of funds). Expenditures for research and development of community organisations (total amount, percentage of income, percentage of GDP). Joint research projects between community organisations and universities and public institutes and amount of funding (number of projects, amount of funds).

- **MEASURE 3.3.** Strengthen the mobility of research human potential, which includes the employment of graduates who have completed an undergraduate, graduate or doctoral study programme, and the employment or temporary work of researchers from public universities and public institutes in the business sector. Double the number of doctorate graduates in the business sector, including support for employing doctorate graduates in the industry and entrepreneurial support to doctorate graduates in the establishment of innovative enterprises.

COMPETENT BODY: Government of the Republic of Croatia, HZZ/CES, HGK/CCE, HUP/CEA

IMPLEMENTATION: HZZ/CES, HGK/CCE, HUP/CEA, National Competitiveness Council, universities and research institutes, alumni associations.

INDICATORS: Number of graduates who completed a graduate study programme employed in research and development in the business sector. Number of doctorate graduates employed in research and development in the business sector. Number of researchers from public universities and public institutes temporarily working on joint research projects in the business sector. Number of researchers from the business sector temporarily working on joint research projects at public universities and public institutes. Number of doctorate graduates employed in research and development in the business sector and public services. Amount of financial support for the establishment of innovative enterprises and number of instances of provided financial support. Number of innovative enterprises set up by doctorate graduates.

- **MEASURE 3.4.** Establish innovative schemes for co-funding of doctoral study programmes and doctoral students, strengthen cooperation with the business sector and solve current societal challenges

COMPETENT BODY: MSES





IMPLEMENTATION: MSES, public universities, through the project proposal for EU funding 'Innovative schemes for co-funding of doctoral study programmes for strengthening cooperation with the business sector and solving the current societal challenges'.

INDICATORS: Number of annual tenders within the framework of the 'Innovative scheme for co-funding of doctoral study programmes for strengthening cooperation with the business sector and solving the current societal challenges'. Level of establishment: number of applications; number and types of approved contracts on co-funding (in total and by thematic areas).

- **MEASURE 3.5.** Within the competitiveness cluster, foster international cooperation and participation of Croatian partners in international research projects and joint participation of universities, research institutes and the business sector at international and national competitions
COMPETENT BODY: Ministry of Economy
IMPLEMENTATION: MSES, Ministry of Economy, Ministry of Agriculture, HZZ/CES, HAMAG BICRO, HGK/CCE, HUP/CEA, universities and research institutes, alumni associations
INDICATORS: Funds for the preparation and submission of joint projects of public universities, public institutes and the business sector (sources, amount). Number and types of submitted projects that include joint participation of public universities, public institutes and the business sector at international competitions. Number and types of approved projects that include joint participation of universities, public institutes and the business sector at international competitions, containing the amount of project funds. Number and types of submitted projects that include joint participation of public universities, public institutes and the business sector at national tenders. Number and types of approved projects that include joint participation of public universities, public institutes and the business sector at national tenders, containing the amount of project funds.
- **MEASURE 3.6.** With regard to commercial activities conducted for social purposes, which are not performed by any other business entities on the market, institutions in the science and higher education system must set up their own limited liability companies and assign these tasks to them
COMPETENT BODY: NVZVO/NCSHE
IMPLEMENTATION: MSES, AZVO/ASHE, public universities and public institutes
INDICATORS: Establishment of limited liability companies for commercial activities with a defined link with the home institution in the science and higher education system.

OBJECTIVE 4: INCLUDE UNIVERSITIES, POLYTECHNICS AND RESEARCH INSTITUTES IN SMART SPECIALISATION PROCESSES AND IN DEFINING GUIDELINES FOR TECHNOLOGY DEVELOPMENT

The concept of smart specialisation implies that knowledge-related resources are concentrated and connected to a smaller number of priority economic activities, in which countries and/or regions may become and remain competitive in the global economy, and so that the economy can be oriented towards smart, sustainable and inclusive growth.¹⁸⁸

PARTICIPATION OF HIGHER EDUCATION AND SCIENCE IN SMART SPECIALISATION PROCESSES

One of the features of smart specialisation is that it is to be created and implemented within the framework of a dynamic research and entrepreneurial process, which requires the participation of higher education and science in evaluating, defining and developing priority economic activities in Croatia. This participation will have synergistic effects and it will foster the networking of the research and business sector.¹⁸⁹ Knowledge and research achievements at public universities and institutes will therefore be institutionally included in expert teams and smart specialisation processes, which will define priority economic activities that are long-term competitive. The progress of these activities will be monitored and evaluated, taking into consideration the need to strengthen science- and knowledge-based development. Priority economic activities will be connected to national and global societal challenges in order to increase exports and reduce imports of products and services needed to solve these challenges.

The task of defining and analysing industrial value chains will be incorporated in the evaluation of priority areas with a view to evaluating both the knowledge and human potential needed for the production (or participation in the production) of certain goods or services, by applying the selected technology and by being well acquainted with the market. What will also be defined and analysed are value networks and the relationships between the education, research and business sectors, which, through their complex and dynamic exchange, create material and non-material values such as knowledge and know-how. In the priority areas defined, new scientific, social and economic value must be and can be achieved, without excluding curiosity in research and innovative creation. To increase the competitiveness of the Croatian economy and employment, and to achieve growth based on the use of in-house knowledge, additional investments will provide support to scientific excellence in smart specialisation areas.



TECHNOLOGY AND TECHNOLOGY DEVELOPMENT

Technology development in the EU has been strategically determined by two dimensions: the Framework Programme for Research and Innovation Horizon 2020 and the smart specialisation concept. Horizon 2020 covers technology in the key priorities, thus defining the guidelines for a common European technological policy, which are: enabling future and emerging technologies with excellent science, and also enabling industrial technologies with research for industrial leadership.

The following technologies have been defined as key enabling technologies (KET) (which open up entirely new possibilities for the development of products, processes, goods and services, as well as give rise to completely new industries and markets): nanotechnology; microelectronics and nanoelectronics; photonics; advanced materials and advanced production systems.¹⁹⁰ In Croatia, and with few exceptions, these technologies are only present in research and they cannot have an impact on the competitiveness of the economy in the short-term. Cooperation in industrial value chains in the EU is essential, since products based on key enabling technologies are highly intensive. Moreover, research, development and innovation require a longer period, whereas the production processes include complex procedures.

European technological priorities related to industrial leadership are focused on supporting research and innovation in information and communication technologies (ICT), nanotechnologies, advanced materials, biotechnology and advanced production. The Internet and the web are key to launching innovation and creativity in society and the economy, and it is estimated that more than ten per cent of global GDP depends on ICT. Of strategic importance are advanced networks, cloud computing with wide possibilities for data processing, sensor and communication devices for smart networked environments that will enable many new applications, as well as an information and communication infrastructure of the highest quality.

Technologies related to societal challenges fall within the framework of the European Technology Platforms (ETP), an industry-led forum.¹⁹¹ In the period up to 2020, the European Technology Platforms are expected to be the key elements of the innovation ecosystem that will develop strategies and ensure business-oriented analyses of bottlenecks in research and innovation, and the possibilities related to societal challenges and industrial leadership.¹⁹²

Croatia will develop guidelines for technology development within the framework of the smart specialisation process that will define priority national economic activities and the related industries, while taking into consideration the European assumptions for future, emerging, enabling and industrial technologies and their potential impact on the competitiveness of the Croatian economy. The defined technologies will



require special investments both in research (with the aim of achieving and maintaining scientific excellence), and in education (since there is a lack of highly educated experts and entrepreneurs trained for the multi-disciplinary nature of technologies in the EU). This will enable a more carefully planned and efficient approach to participating in European programmes, projects and cooperation.

- **MEASURE 4.1.** Institutionally include universities, polytechnics and research institutes in smart specialisation processes. Incorporate the definition and analysis of industrial value chains and value networks in the criteria for evaluating priority areas.

COMPETENT BODY: Ministry of Economy

IMPLEMENTATION: MSES, Ministry of Economy, Ministry of Agriculture, universities, polytechnics and research institutes

INDICATORS: Institutional inclusion of universities, polytechnics and research institutes in defining the criteria for evaluating priority smart specialisation areas. The industrial value chain and value network for each priority smart specialisation area defined.

Levels of additional investments: fostering of scientific excellence in smart specialisation areas (sources and amount).

- **MEASURE 4.2.** Develop guidelines for technology development within the framework of the smart specialisation process, and define priority economic activities and the related production in Croatia, taking into account the European and global technology principles for the period 2014–2020.

COMPETENT BODY: NVZVO/NCSHE

IMPLEMENTATION: MSES, Ministry of Economy, Ministry of Agriculture, universities, polytechnics and research institutes

INDICATORS: Level of institutional inclusion of universities, polytechnics and research institutes in defining guidelines for technology development aligned with priority smart specialisation areas. Guidelines for technology development defined for each priority smart specialisation area.

OBJECTIVE 5: ESTABLISH NATIONAL RESEARCH AND INNOVATION INFRASTRUCTURES THAT ARE PUBLICLY ACCESSIBLE AND THAT ARE INCLUDED IN AND LINKED TO EUROPEAN INFRASTRUCTURES

Research infrastructures include equipment, facilities and resources used by research communities to conduct research. Due to the fact that new knowledge and related innovations are only created in an environment with adequate advanced infrastructure, Croatia will be building and enhancing its national research and innovation infrastructures. Along with joint e-infrastructure, these infrastructures include the equipment





of laboratories that create and will create the research potential capable for being included in national and large-scale international collaboration programmes, as well as equipment for knowledge centres (that is, centres of excellence and competence centres, and networks). European models will therefore be applied, which will enable joint and coordinated procurement and use of equipment. Furthermore, connecting with and inclusion in the European research and innovation infrastructures will be carried out.¹⁹³ Models that include the participation of the business sector in the funding of new equipment and models for the joint use of the research and innovation infrastructures will be developed.

A system of public access to existing and new public research infrastructures and to equipment purchased from sources of public funding will be established. The system will contain all information regarding available capacities and possibilities of use, along with a provision of resources for its maintenance and functioning (including human resources to provide equipment management services). In addition, open access to scientific and expert information resulting from sources of public funding will be established.¹⁹⁴

E-INFRASTRUCTURE OF THE CROATIAN RESEARCH AND HIGHER EDUCATION AREA

Both globally and in Croatia, e-infrastructure is one of the main, de facto, basic joint infrastructure systems for science and higher education. E-infrastructure refers to the environment in which scientists, researchers, students and other members of the academic and research community gain joint access to distributed and/or common research resources, such as expensive instruments, advanced computing tools, and communication and data, regardless of the type of these resources and their geographic location.

E-infrastructure intended for science and connecting researchers must be of better quality than the e-infrastructure that is commercially available. The implementation of the Digital Agenda for Europe programme is important for enabling full access to e-infrastructure outside of academic and research institutions.

Without advanced and developed e-infrastructure, the science and higher education system cannot successfully introduce changes and fulfil its role in society and the economy. This infrastructure, which will be set up through the Croatian Scientific and Educational Cloud (HR-ZOO), will provide the services of virtual computing and storage resources, based upon: the principle of cloud computing; grid resources;¹⁹⁵ high-performance computing resources; massive storage capacities; a rapid optical network; and connecting to the GEANT

European academic and research network. Taking into account the fact that contemporary research relies on data intensive complex calculations,

it is necessary to set up centres of research and innovation excellence that will promote new research paradigms (known as e- Science, Big Data, Fourth Paradigm) that enable the efficient use of e-infrastructure.

RESEARCH EQUIPMENT OF LABORATORIES AND CENTRES OF EXCELLENCE

An important component of research and innovation infrastructures are laboratories in which the research potential for inclusion in large-scale European collaboration programmes is and will be created. Infrastructure projects will therefore include improving existing laboratories and equipping new ones, while large-scale infrastructure projects conducted by centres of excellence will not be funded at the expense of projects for equipping these research cores.

INCLUSION IN EUROPEAN RESEARCH INFRASTRUCTURES

To conduct frontier research within the Horizon 2020 programme, such infrastructures are needed that go beyond the possibilities of certain countries. Back in 2002, the European Commission, with the consent of all Member States, set up the European Strategy Forum on Research Infrastructures (ESFRI). The ESFRI enables the Member States to express their common interests as regards to the establishment and use of research infrastructures.^{196,197}

In Croatia, in areas where there is a critical mass of scientists who might join an existing ESFRI network or project, a Croatian Strategy Forum on Research Infrastructures (CSFRI) will be established and will be connected to the European counterpart. As joining the ESFRI requires payment of a membership fee and other obligations by Croatia, it will be ensured that all interested researchers, research groups and institutions are included in the CSFRI. Moreover, the European Union has planned to use the ERIC (European Research Infrastructure Consortium) instrument as a means to strengthen the pan-European scientific infrastructure by integrating the capacities of Member States or by creating new supranational infrastructural capacities. Croatia has signed the Memorandum of Understanding, highlighting its dedication to joining certain ERIC initiatives, and it is also considering the possibility of joining other European initiatives.

SCIENTIFIC EVALUATION OF INFRASTRUCTURAL PROJECT PROPOSALS

The criteria for the scientific evaluation of infrastructural project proposals, projects for the acquisition of research equipment, and projects for connecting with and joining European and other international research and innovation infrastructures must incorporate strategic inclusion, relevance for Croatia, the scientific potential, manner of use and the user base, as well as achievability and sustainability, in accordance with European good practice.¹⁹⁸





Strategic inclusion refers to compliance with the Croatian and European strategic guidelines and compatibility with the ESFRI.

Relevance for Croatia is determined on the basis of the following precepts: its contribution to the progress of science and the research competitiveness of institutions; its impact on the training of young researchers; its use for enhancing university teaching; its incorporation in the Croatian higher education and research area and in the innovation ecosystem; and whether or not it encourages the solving of a societal challenge and/or encourages economic development.

Scientific potential is confirmed by the following: the basic purpose; number of researchers with considerable research potential; anticipated new scientific knowledge; importance of the research for new relevant innovation processes; fostering interdisciplinary cooperation between researchers; a common planned infrastructure; and whether such infrastructures already exist or if they are planned.

The manner of use and the user base includes: groups of users and their size; groups of researchers only from the home institution of the infrastructure or those from other institutions; the interest of the business sector or of the social community for the use; international interest for the use; the manner of funding the work; whether the home institution is able to cover the costs of use and maintenance; and the fees defined for researchers from other institutions and from the business sector.

Achievability is determined by: financial conditions; existing technical solutions and equipment; the necessary innovative development; the construction schedule; technical conditions at the home institution (energy, air-conditioning and similar); facilitating the use for groups both within and outside of the home institution; and professional maintenance staff. Sustainability is determined by the human, material and spatial resources available for the use of the infrastructure over a prolonged period of time.

All infrastructural projects will be documented in such a manner that they enable the recognition of the set parameters for the five evaluation dimensions. Projects foreseeing the use of foreign or international infrastructures will be assessed in a similar manner. The participation of industry in the funding of new equipment will be evaluated separately.

- **MEASURE 5.1.** Establish a transparent system of evaluating infrastructural project proposals, projects for equipment procurement and projects foreseeing the use of foreign or international infrastructures, and implement it in making decisions on investments
COMPETENT BODY: MSES
IMPLEMENTATION: MSES, universities and research institutes
INDICATORS: Adopted and published evaluation criteria aligned with Croatian and European strategic guidelines, based on an

explanation and argumentation of relevance for Croatia and the scientific potential, including a clear projection of the manner of use, the user base, achievability and sustainability

- **MEASURE 5.2.** Build an advanced joint e-infrastructure of the Croatian education and research area

COMPETENT BODY: MSES

IMPLEMENTATION: University Computing Centre (SRCE), Croatian Academic and Research Network (CARNET), Ruđer Bošković Institute, Josip Juraj Strossmayer University of Osijek, University of Rijeka, University of Split and University of Zagreb, through the project proposal for EU funding 'Croatian Scientific and Educational Cloud'

INDICATORS: Launching of the project 'Croatian Scientific and Educational Cloud' in 2014. Extent of construction of the advanced joint e-infrastructure of the Croatian education and research area. Level of user satisfaction.

- **MEASURE 5.3.** Establish a system of open access to existing and new public research infrastructures and to equipment procured from sources of public funding. Establish data services, including digital repositories for facilitating the efficient collecting, processing and securing of permanent and reliable storage of and access to research results, including open access to scientific and expert information resulting from sources of public funding.

COMPETENT BODY: MSES, NVZVO/NCSHE

IMPLEMENTATION: Through the project proposal for EU funding 'Project for the system of open access to research infrastructures and results of publicly funded research' (Proposal for the project holder: University Computing Centre (SRCE) and cooperative institutions, including the National and University Library of Croatia)

INDICATORS: Launching of the 'Project for open access to research infrastructures and results of publicly funded research' in 2014. Assessment of the extent to which the system of open access to public research infrastructures and equipment (procured from the sources of public funding and of data services) is operational. Level of user satisfaction.

- **MEASURE 5.4.** Establish a system and ensure competitive mechanisms for the equipping of existing and new laboratories, either operating independently or within the framework of centres of excellence, on the basis of a transparent evaluation by applying the criteria from MEASURE 5.1.

COMPETENT BODY: MSES

IMPLEMENTATION: Public universities and public institutes, through project proposals for EU funding.

INDICATORS: Roadmap adopted for the construction of Croatian research infrastructures. The Croatian Strategic Forum on Research Infrastructures (CSFRI) established. Proposals for infrastructural





projects, projects for equipment procurement and projects foreseeing the use of foreign or international infrastructures evaluated according to criteria and evaluation results (type of proposal, assessment according to individual criteria, approved/non-approved, and amount of funds). Projects for equipping laboratories submitted for EU funding. Projects for equipping laboratories approved for EU funding and dynamics of equipping each laboratory. Projects by centres of excellence submitted for EU funding (research equipment). Projects of centres of excellence approved for EU funding and dynamics of equipping each individual centre of excellence.

OBJECTIVE 6: FOSTER THE GROWTH OF INVESTMENTS IN RESEARCH AND DEVELOPMENT BY ENHANCING THE SYSTEM OF PUBLIC FUNDING AND BY ENCOURAGING MORE INVESTMENTS FROM THE BUSINESS AND SOCIAL SECTORS

The strategic goal of the EU is to increase investment in research and development from the current 2 per cent to 3 per cent of gross domestic product (GDP) by 2020, whereby two-thirds of the funds for research and development would be invested from the business sector, in order for the EU to catch up with the most developed countries in the world and its direct competitors.¹⁹⁹ Growth of investment in research and development is a Croatian strategic goal as well. Investments of 1.4 per cent of GDP are expected, of which 0.7 per cent would be invested through state/public funding. By introducing measures for strengthening the funding of research and development from the business sector and other national and foreign sources, the aim is to achieve investments of 2 per cent of GDP in 2020.

INVESTMENTS IN RESEARCH AND DEVELOPMENT IN CROATIA AND THE EUROPEAN UNION

Investments in research and development are measured by government budget appropriations or outlays on research and development and gross domestic expenditure on research and development. Budgetary expenditures for research and development in EU-27 countries amounted to 0.73 per cent of GDP in 2011, ranging from 0.15 per cent to 1.09 per cent among the Member States.²⁰⁰ Government budget appropriations or outlays on research and development in Croatia amounted to 0.74 per cent of GDP in 2011.²⁰¹

Total investments in research and development measured by and gross domestic expenditure on research and development in EU-27 countries amounted to 2.03 per cent of GDP in 2011, whereby the intensity of investing varies substantially between Member States – ranging from

3.37percent to less than 0.5percent. Gross domestic expenditures for research and development in Croatia in 2011 were much below the European average, amounting to 0.75 per cent of GDP.²⁰²

The average annual growth of and gross domestic expenditure on research and development in EU-27 countries amounted to 3 per cent in the 2005–2011 period, which varied between Member States, while the average annual decrease of gross domestic expenditures for research and development amounted to 1 per cent in Croatia.

In comparison to the EU, the indicators by sectors and sources of funding for and gross domestic expenditure on research and development in Croatia in 2011 are as follows: the business sector²⁰³ (the EU: 62.3 per cent, Croatia: 44.6 per cent), higher education²⁰⁴ (the EU: 24.0 per cent, Croatia: 27.4 per cent), the government sector²⁰⁵ (the EU: 12.7 per cent, Croatia: 27.7 per cent) and the non-profit sector²⁰⁶ (the EU: 1.0 per cent, Croatia: 0.3 per cent). Sources of funding for research and development in 2010 are as follows: the business sector (the EU: 53.9 per cent, Croatia: 38.8 per cent), state and local government (the EU: 34.6 per cent, Croatia: 49.2 per cent), other national sources (the EU: 2.6 per cent, Croatia: 2.1 per cent) and external sources (the EU: 8.9 per cent, Croatia: 9.9 per cent).

PUBLIC INVESTMENTS IN RESEARCH AND DEVELOPMENT

Public funding of research and development is a precondition for the long-term stability, autonomy and international competitiveness of Croatian science. Additional sources of funding of research and development from European funds cannot and must not substitute the insufficient amount of investments from national sources of funding.

The analysis of budgetary expenditures in Croatia, as the main source of public funds for research and development, has shown that they are insufficient, non-directed and variable, while coordination for using state sources of funding is inefficient.

Budgetary investments in research and development will be primarily directed towards the funding of researchers and research projects, which will be followed by the procurement of research equipment, and will be least directed towards the funding of the construction of new facilities. Along with the growth of budgetary expenditures by the Ministry of Science, Education and Sports for research and development, the responsibility for budgetary expenditures for research and development will be divided between all ministries who are to ensure additional funds within the scope of their competence. These funds will be directed towards financing competitive research and earmarked projects through tenders implemented by foundations and agencies.

Public enterprises, community organisations and state institutions will be investing (directly or through foundations and agencies) in research





and development, as well as in projects implemented jointly with universities and research institutes. What is particularly relevant is research and cooperation related to societal challenges that largely overlap with the work of public enterprises, community organisations and state institutions; the lack of which will hinder the possibility of solving these challenges efficiently, both in terms of expenditures and in timely manner.

Local and regional self-government will contribute to strengthening local and regional research, development and innovation resources with funds for earmarked projects through tenders.

All public funds will be allocated in a transparent manner.

INVESTMENTS OF THE BUSINESS SECTOR IN RESEARCH AND DEVELOPMENT

The analysis of gross domestic expenditure on research and development has shown that total expenditure is low, and while it has been on the rise in most EU countries, it has been declining in Croatia. The share of the business sector is much too low and far below the European average.

In order to rectify this situation, a general refocusing of expenditures towards research and innovation, and towards small and medium-sized enterprises is essential in Croatia.²⁰⁷

Incentives and support that have been proven efficient in other EU countries will strengthen the role of small and medium-sized enterprises in research, development and innovation, while this role will be maintained and strengthened in large enterprises. The establishment and growth of innovation enterprises will be accelerated, and cooperation and joint projects between the business sector and public universities and public institutes will be fostered. As is the case globally, the business sector will earmark the majority of funds for 'in-house research and development activities'. The growth of investments of the business sector in 'external services of research and development' and in 'the acquisition of external knowledge' will depend on the competitiveness of the higher education and research community, as well as on state measures for strengthening research, development and innovation.

Many research, innovation and business activities related to new and high technologies, as well as knowledge-based services, do not require huge investments in long-term assets, but they are knowledge- and work-intensive. This will be taken into account during the process of enhancing the investment environment.

INVESTMENTS IN RESEARCH AND DEVELOPMENT FROM OTHER NATIONAL AND INTERNATIONAL SOURCES

The measures that have proved successful in other EU countries will be stimulated by extra-budgetary investments in the Croatian Science Foundation and by the establishment and financial strengthening of private foundations.

Funds for the preparation of international research projects will be ensured, and the joint participation of public universities, public institutes and the business sector in international and national tenders will be fostered.

- **MEASURE 6.1.** Achieve growth of investments in research and development of 1.4 per cent of GDP, of which 0.7 per cent will be invested through state/public funding, and by a general refocusing of expenditures towards research and innovation, small and medium-sized enterprises and by strengthening the funding of research and development from the business sector and other national and foreign sources, with the aim of achieving investments of 2 per cent of GDP in 2020.

COMPETENT BODY: Government of the Republic of Croatia

IMPLEMENTATION: Government of the Republic of Croatia

INDICATORS: Gross domestic expenditures for research and development in the business sector (amount and structure of expenditures, percentage of GDP). Gross domestic expenditures for research and development in higher education (amount and structure of expenditures, percentage of GDP). Gross domestic expenditures for research and development in the government sector – public institutes (amount and structure of expenditures, percentage of GDP). Gross domestic expenditures for research and development in the non-profit sector (amount and structure of expenditures, percentage of GDP). The source of funding for research and development: the business sector, state and local government, other national sources, external sources (amount, percentage of GDP).

- **MEASURE 6.2.** Growth and diversification of budgetary expenditures for research and development, including the growth of budgetary expenditures of MSEs and an increase of the share of other ministries' to 30 per cent of the total budgetary expenditure for research and development

COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: All ministries

INDICATORS: State budget: expenditure for research and development within the framework of budgetary cost items of all ministries (source, amount, percentage of GDP)





- **MEASURE 6.3.** Implement budgetary investments in research and development in accordance with the methodology and shares applied by the EU in the Horizon 2020 Framework Programme, and direct it primarily towards researchers and research projects, followed by the procurement of research equipment, and least of all in the construction of new facilities

COMPETENT BODY: Government of the Republic of Croatia, NVZVO/NCSHE, Croatian Science Foundation

IMPLEMENTATION: Government of the Republic of Croatia, HZZ/CES, HAMAG BICRO

INDICATORS: Gross domestic expenditures for research and development in higher education (amount and structure of expenditures, percentage of GDP). Gross domestic expenditures for research and development in the government sector – public institutes (amount and structure of expenditures, percentage of GDP). The source of funding of research and development: state and local government (amount, percentage of GDP). Budgetary funds earmarked for excellent science, including frontier research, as well as future and emerging technologies (not less than 33percent, amount, increase and share). Budgetary funds earmarked for industrial leadership, including enabling and industrial technologies (amount, increase and share). Budgetary funds earmarked for societal challenges related to health, food, transport, climate and an inclusive and safe society (amount, increase and share; both in total and by challenges). Budgetary funds earmarked for cooperation between the research and business sector (amount, increase and share). Budgetary funds earmarked for bilateral international cooperation (amount; increase and share; number of projects; and amount of funds by countries).

- **MEASURE 6.4.** Increase budgetary funds for scientific competitive programmes and projects to at least 0.15 per cent of GDP

COMPETENT BODY: Government of the Republic of Croatia IMPLEMENTATION: MSES

INDICATORS (per year): Funds for competitive programmes and projects (amount, percentage of GDP)

- **MEASURE 6.5.** Facilitate investing of innovation economy in research, development and innovation, including research projects implemented jointly with public universities and institutes

COMPETENT BODY: Government of the Republic of Croatia

IMPLEMENTATION: HZZ/CES, HAMAG BICRO

INDICATORS: Level of enhancement of the system of support and incentives for research, development and innovation in the economy, especially industry. State of and trends in research, development and innovation in the economy (according to indicators of the Croatian Bureau of Statistics and Eurostat). Gross domestic expenditures for research and development in the business sector (amount and structure of expenditures, percentage of GDP). The

source of funding of research and development: the business sector (amount, percentage of GDP). Expenditures for research and development of public enterprises (total amount, percentage of income and percentage of GDP). Expenditures for research and development of community organisations (total amount, percentage of income, percentage of GDP). Joint research projects between the business sector and public universities or institutes (number of projects; for each project: composition of the research team, number of researchers and amount of funds). Public procurement fostering innovation and innovation partnership (number of tenders and amount of funds; in total and by societal challenges).

- **MEASURE 6.6.** Stimulate investments from the business sector in the Croatian Science Foundation, and establish private foundations and strengthen them in terms of finances by applying measures that have proven effective in EU countries

COMPETENT BODY: Government of the Republic of Croatia

IMPLEMENTATION: Ministry of Finance, MSES, Ministry of Economy, Ministry of Agriculture

INDICATORS: Level of adopted incentives for investments from the business sector in the Croatian Science Foundation and other foundations. Private investments in the Croatian Science Foundation (source, amount). Private foundations conducting activities in the area of research and development (total number, number of newly established foundations; for each foundation: tender, number of submitted and approved projects, amount of available and approved funds).



GUIDELINES FOR THE IMPLEMENTATION OF THE STRATEGY

This Strategy covers a large system that starts with pre-school education and continuing through all the phases of formal, non-formal and informal education. The education system is interrelated with the science system, which is also covered by this Strategy. Their synergies should result in innovations in all fields of human activity. Innovation, however, is covered by a specific strategy, which must be closely linked to document, as well as with the Croatian Research and Innovation Infrastructures Roadmap and all other relevant strategic or implementation documents, including normative acts in the fields of education and science. The mediation of knowledge and the popularisation of research are of great importance for the implementation of this Strategy. For this reason, scientific publishing should be systematically supported, as well as media activities for the popularisation of science and for promoting the importance of education. This requires designing, developing and maintaining a strong (sub)system or network of activities that would continuously, actively and creatively develop the relationship between science and the general public. This network of activities would collect scientific information, shape an image of the world according to scientific results and achievements and educate the general public to follow developments in science and education.

In order to rationalise costs and avoid placing an additional burden on teachers and educational staff, relevant civil society organisations should also be included in the implementation of this Strategy. Namely, civil society organisations that work with children and young people can provide high-quality support to students, families and educational staff, and can facilitate the adaptation, integration (inclusion), development and the success of students in schools. Such organisations represent a resource that has until now been insufficiently used. They can become dynamic, high-quality and effective partners to schools, with different organisations responding to different needs of students.

Achieving the goals of this Strategy will not be possible without the cooperation of all ministries and other stakeholders in the education system, including local self-government, trade associations, the Croatian Parliament (and its bodies), agencies and the Government. Special responsibility lies, of course, with the MSES. An action plan for the implementation of this Strategy (including a timetable for the implementation of measures) will be developed and adopted no later than one month after the appointment of the expert committee.



As stated in the introduction, the implementation of this Strategy is a long-term project and the Strategy must be periodically evaluated and must allow for possible revisions or additions (if necessary). Systematic monitoring of its implementation is necessary in order to establish on time whether the planned results are being reached, i.e. whether the set objectives are being achieved within the specified time frame. It is therefore necessary to ensure coordination of all activities related to the implementation of the Strategy.

In order to coordinate the actions related to the implementation of this Strategy, monitor its implementation and ensure synergies with other related strategies, an expert committee will be established at the Office of the Prime Minister. The expert committee will design a two- year action plan for the implementation of the Strategy, monitor its implementation and report bi-annually to the Parliament through the Government on the state of play of the implementation of the Strategy. In addition, if required by the circumstances, it will propose possible amendments and modifications of the Strategy to the Government.

OBJECTIVE 1: DEVELOP A FRAMEWORK FOR THE IMPLEMENTATION OF THE STRATEGY

- **MEASURE 1.1.** Establish an expert committee (under the Office of the Prime Minister of the Republic of Croatia) for the implementation of the Strategy for Education, Science and Technology and for the coordination of strategies and activities in the field of education and science
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: Government of the Republic of Croatia
INDICATORS: Expert committee appointed
- **MEASURE 1.2.** Adopt an action plan for the implementation of the Strategy for Education, Science and Technology
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: Expert committee
INDICATORS: Action plan adopted for the implementation of the Strategy for Education, Science and Technology
- **MEASURE 1.3.** Analyse whether there is a need to amend existing legislative and implementing acts in order to achieve the objectives of the Strategy
COMPETENT BODY: Expert committee
IMPLEMENTATION: Expert group for the analysis of necessary amendments to the existing legislative and implementing acts in order to achieve the objectives of the Strategy
INDICATORS: Analysis conducted regarding the necessary amend-

ments to the existing legislative and implementing acts in order to achieve the objectives of the Strategy

- **MEASURE 1.4.** Define procedures for analysing the implementation indicators of the Strategy
COMPETENT BODY: Expert committee
IMPLEMENTATION: Working group for defining the procedures for analysing the implementation indicators of the Strategy
INDICATORS: Strategy implementation indicators developed

OBJECTIVE 2: IMPROVE THE FUNDING SYSTEM FOR EDUCATION AND SCIENCE

- **MEASURE 2.1.** Gradually change the structure of expenditure on education and science in order to reduce the share of expenditure on staff costs, while also increasing the overall funding level from the state budget and GDP
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: MSES, Ministry of Finance
INDICATORS: By 2020 expenditure on education and science amounts to 6 per cent of GDP. By 2030 expenditure amounts to 7 per cent of GDP. At least 85 per cent of European funds of planned for education and science are used.
- **MEASURE 2.2.** Improve funding coordination processes and the processes for the control of expenditure between relevant ministries, state and local authorities
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: Regular activity of the agencies and the relevant ministries
INDICATORS: Use of public funds invested per participant. Utilisation of funds in relation to planned funds.
- **MEASURE 2.3.** Equalise the tax treatment of all accredited education institutions regardless of their founder, especially in the area of income tax
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: Ministry of Finance
INDICATORS: Act and regulations on income tax (and acts in other areas, if necessary) are amended
- **MEASURE 2.4.** Define indicators for the effective implementation of the lifelong learning objectives for the purposes of monitoring and of management of funding. Submit annual reports by the competent national and local authorities and education providers; unified and organised according to defined indicators.





COMPETENT BODY: Expert committee IMPLEMENTATION: Competent agencies

INDICATORS: Performance indicators for the lifelong learning process. Number of participants of programmes. Utilisation of funds in relation to their effectiveness

OBJECTIVE 3: PROMOTE SCIENTIFIC AND PROFESSIONAL PUBLISHING

- MEASURE 3.1. Establish a working group for drafting the objectives, measures and responsibilities related to scientific and professional publishing

COMPETENT BODY: Expert committee

IMPLEMENTATION: MSES, Ministry of Culture, Union of Publishers and Booksellers at the Croatian Chamber of Economy

INDICATORS: Proposal made for the objectives, measures and responsibilities related to scientific and professional publishing

OBJECTIVE 4: INCREASE THE PUBLIC AVAILABILITY OF INFORMATION ON SCIENCE, RAISE PUBLIC AWARENESS ABOUT SCIENCE AND INCREASE THE PUBLIC IMPACT OF SCIENCE

- MEASURE 4.1. Create a system for media coverage of education and science

COMPETENT BODY: MSES, Croatian Journalist Association

IMPLEMENTATION: MSES

INDICATORS: Increase in the number and improvement of the quality of media content dedicated to education and science

- MEASURE 4.2. Educate journalists and scientists for media coverage of science

COMPETENT BODY: MSES, Ministry of Culture, Croatian Journalist Association, adult education institutions, higher education institutions

IMPLEMENTATION: MSES, stakeholders in the field of science, Croatian Radio Television, Croatian News Agency

INDICATORS: Increased number of press releases and improved quality of content in the media, as well as increased public interest in educational and scientific topics

OBJECTIVE 5: ENSURE OTHER PRECONDITIONS FOR THE IMPLEMENTATION OF THE STRATEGY

- **MEASURE 5.1.** Ensure equal financial preconditions for the operation of all public education institutions
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: MSES, Ministry of Finance, local self-government units
INDICATORS: Equal working conditions in primary and secondary schools
- **MEASURE 5.2.** Ensure equal access to information and communication technologies in all institutions of education and science
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: MSES, Ministry of Maritime Affairs, Transport and Infrastructure, CARNET and Croatian Regulatory Authority for Network Industries
INDICATORS: Broadband Internet (or another adequate type of connection) is available to all institutions in education and science
- **MEASURE 5.3.** Provide timely, regular, objective and high-quality information to the public about the objectives and implementation of the Strategy and education and research in general; periodically organise public debates on the implementation of the Strategy
COMPETENT BODY: Government of the Republic of Croatia
IMPLEMENTATION: MSES
INDICATORS: Systematic and high-quality publication of information about the objectives and implementation of the Strategy and on education and research

OBJECTIVE 6: DEVELOP ACTION PLANS FOR THE IMPLEMENTATION OF THE STRATEGY

- **MEASURE 6.1.** Organise projects for the development of action plans for the implementation of complex measures
COMPETENT BODY: Expert committee
IMPLEMENTATION: Professional teams
INDICATORS: Completed projects



OBJECTIVE 7: INTEGRATE LIFELONG LEARNING AND EDUCATION POLICY WITH OTHER PUBLIC POLICIES RELATED TO PERSONAL, SOCIAL, ECONOMIC, REGIONAL AND CULTURAL DEVELOPMENT, AS WELL AS WITH EMPLOYMENT AND SOCIAL WELFARE POLICY



It is necessary to develop integrated and coordinated processes for implementing lifelong learning and education policies, at the centre of which are aspirations, detection and development of individuals' capabilities, aims and cultural and other values of the society and economic development.

Linking the registers and other databases of the Croatian Employment Service, the Croatian Pension Insurance Institute, the Central Registry of Affiliates and of ministries and agencies in the field of education will provide the possibility to generate a time series of key data on the economic activities of the working-age population by relevant characteristics. Changes in outcomes that have resulted from decisions taken during education and work would be analysed for the purpose of research in career development. Such data could be used for the following areas: analysis of effects of labour market policies, development and education; longitudinal studies on the effects of qualifications; development of sector profiles; assessment of labour mobility; monitoring changes in activities (occupational, physical) by status (employed, unemployed, inactive); and for providing career information and career counselling.

Quantitative data and appropriate qualitative methods are necessary not only for conducting analysis but also for forecasting future labour market needs. This is particularly the case for demand at the level of individual activities and groups of occupations such as: education planning; enrolment quotas; adult education programmes; development of sector profiles; more reliable human resource development in regional and national development plans; and planning the network of education institutions.

The results of such analyses will be used to continuously implement projects that develop new occupational standards and qualifications standards, as well as new programmes based on those standards. European structural funds should be used for the development of such programmes, as well as for their pilot introduction and for their implementation. The programmes would be carried out continuously as part of the process of adapting knowledge and skills to the needs of the individual, the community and the economy.

A high-quality system for monitoring and evaluating policies (as well as for monitoring the implementation of measures defined in this strategic objective) will provide the basis to learn from experience. Therefore, a

system for directing and managing such activities should be established under the authority of the National Council for the Development of Human Potential (NCDHP). The Council should adopt guidelines and decisions in cooperation with the National Education Council (NEC) and the National Council for Science, Higher Education and Technological Development (NCSHE).

In the process of lifelong learning, special importance is placed on work-based learning, which should become an integral part of a system for acquiring practical knowledge and skills at the level of secondary school, higher education and adult education and training. Greater involvement in the work processes during education will raise the employability of students and speed-up the process of adaptation to the workplace.

- **MEASURE 7.1.** Design and establish a Public Register of Human Potential and link databases of employees, the unemployed and learners attending formal education programmes
COMPETENT BODY: State and public administration bodies (MSES, Ministry of Labour and Pension System, Ministry of Public Administration)
IMPLEMENTATION: Relevant ministries and Croatian Employment Service, agencies in the education sector
INDICATORS: Public Register of Human Potential established.
Percentage of the population and percentage of learners attending formal education programmes included in the database/register.
- **MEASURE 7.2.** Establish a system for the monitoring and evaluation of integrated policies of development, education and employment, based on their defined objectives.
Conduct a needs analysis of the labour market and society as a whole and prepare and implement projects aimed at the development of new occupational standards and qualifications standards, as well as educational programmes based on those standards.
COMPETENT BODY: NCDHP in cooperation with other National Councils
IMPLEMENTATION: Ministries responsible for the implementation of the CROQF
INDICATORS: Assessment of the extent to which the system for monitoring and utilisation of the data obtained from annual reports on the effects of policies and measures (in relation to set objectives and selected indicators) is operational. Number of new occupational standards, qualifications standards and related educational programmes, based on the analysis of the labour market and society as a whole.
- **MEASURE 7.3.** Develop models and tools for forecasting needs for knowledge, skills and qualifications in line with the development goals of society and with foreseeable demographic and migratory changes
COMPETENT BODY: State and public administration bodies





IMPLEMENTATION: Relevant ministries, public employment services, trade associations, chambers, higher education institutions
INDICATORS: Number of models and tools. Quality of the methodology (level of usage of the obtained data).

- **MEASURE 7.4.** Develop a model and implementation mechanisms for the acquisition of practical knowledge and skills in a work environment as part of the qualifications that prepare for the labour market
COMPETENT BODY: MSES, Ministry of Labour and Pension System and all other ministries related to the economy and individual sector
IMPLEMENTATION: Employers, craftsmen, employers' associations, social partners, agencies, education institutions, civil society, public administration
INDICATORS: Percentage of employers who are certified to receive students to work during their education. Percentage of learners involved in the work processes during regular and adult education. Increase of employability of people with new skills compared to those who did not have the same learning process. Results of employer survey about their satisfaction with the work of new employees.
- **MEASURE 7.5.** Develop a model to promote shortage occupations
COMPETENT BODY: MSES, Ministry of Labour and Pension System and other ministries related to the economy and individual sectors, local self-government units
IMPLEMENTATION: Employers, craftsmen, employers' associations, social partners, agencies, education institutions, civil society organizations, public administration
INDICATORS: Decline in demand for shortage occupations. Incentives ensured for shortage occupations in the form of additional employee benefits and provision of accommodation for working in smaller towns.



**GUIDELINES FOR THE IMPLEMENTATION
OF THE STRATEGY**

ABBREVIATIONS

ENGLISH	CROATIAN	FULL NAME IN ENGLISH
	AZUP	Common Andragogical Data Register
	HAKOM	Croatian Regulatory Authority for Network Industries
	HAMAG	Croatian Agency for SMEs, Innovations and Investments
	BICRO	
	SRCE	University Computing Centre
AGR	VOI	Unit for the preparation of a comprehensive system for monitoring, assessing, grading and reporting as a part of the comprehensive curricular reform
AMEUP	AMPEU	Agency for Mobility and EU Programmes
ASHE	AZVO	Agency for Science and Higher Education
AVETAЕ	ASOO	Agency for Vocational Education and Training and Adult Education
CARNet	CARNet	Croatian Academic and Research Network
CASA	HAZU	Croatian Academy of Sciences and Arts
CBRD	HBOR	Croatian Bank for Reconstruction and Development
CCE	HGK	Croatian Chamber of Economy
CCTC	HOK	Croatian Chamber of Trades and Crafts
CEA	HUP	Croatian Employers' Association
CEEPUS		Central European Exchange Program for University Studies
CES	HZZ	Croatian Employment Service
CF		Cohesion Fund
CISOK	CISOK	Lifelong Career Guidance Centre
CJA	HND	Croatian Journalists' Association
CNES	HNOS	Croatian National Educational Standard
CROQF	HKO	Croatian Qualifications Framework
CSF		Common Strategic Framework
CSF	HRZZ	Croatian Science Foundation
EAFRD		European Agricultural Fund for Rural Development
EAR	AGR	Unit for the preparation of a comprehensive system of monitoring, assessment, grading and reporting as a part of the comprehensive curricular reform
ECTS		European Credit Transfer System
ECVET		European Credit System for Vocational Education and Training
ELGPN		European Lifelong Guidance Policy Network
EMFF		European Maritime and Fisheries Fund
EQA	OKO	Unit responsible for education quality assurance
EQF		European Qualifications Framework



ABBREVIATIONS

ERC		European Research Council
ERDF		European Regional Development Fund
ESF		European Social Fund
ESG		Standards and Guidelines for Quality Assurance in the European Higher Education Area
ESIF		European Structural and Investment Funds
ETTA	AZZO	Education and Teacher Training Agency
ETUCE		European Trade Union Committee for Education
EU		European Union
EWGR	SRS	Expert working groups for the preparation of national curricular documents
EWGRI	ERS	Expert working group for innovation and modernisation of the National Curriculum Framework and harmonisation of various educational policy documents
FET		Future and Emerging Technologies
FTE		Full-time equivalent
GDP	BDP	Gross domestic product
HDI		Human Development Index
HEIIS	ISVU	Higher Education Institutions Information System
ICT	IKT	Information and Communication Technologies
KEY		Key Enabling Technologies
KIC		Knowledge and Innovation Community
LLP		Lifelong Learning Programme
MET	MST	Mobile Expert Teams
MLPS	MRMS	Ministry of Labour and Pension System
MMATI	MPPI	Ministry of Maritime Affairs, Transport and Infrastructure
MoE	MINGO	Ministry of Economy
MoEC	MINPO	Ministry of Entrepreneurship and Crafts
MoF	MFIN	Ministry of Finance
MoI	MUP	Ministry of the Interior
MRDEUF	MRRFEU	Ministry of Regional Development and EU Funds
MSES	MZOS	Ministry of Science, Education and Sports
NCC	NVK	National Competitiveness Council
NCDHP	NVRLJP	National Council for the Development of Human Potential
NCEE	NCVVO	National Centre for External Evaluation of Education
NCF	NOK	National Curriculum Framework
NCSHE	NVZVO	National Council for Science, Higher Education and Technological Development
NEC	NVOO	National Education Council
NUL	NSK	National and University Library
OECD		Organisation for Economic Co-operation and Development
PISA		Programme for International Student Assessment
SEECEL		South East European Centre for Entrepreneurial Learning
SNI	MPU	Support network for the introduction of curricular documents into the education system

STEM		Science, Technology, Engineering, Mathematics
UEAS	JSAP	Unit for expert and administrative support for the preparation of curricular documents
UNDP		United Nations Development Programme
VET	SSO	Vocational education and training



ABBREVIATIONS

FOOTNOTES

- 1** In the text the words and terms used with a gender meaning, shall equally apply to both genders (masculine and feminine) and to both numbers (singular and plural), regardless of whether they are used in the masculine or feminine form, or the singular or plural form. (This is relevant for the Croatian version of the Strategy.)
- 2** Recommendation 2006/962/EC of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning, Official Journal L 394 of 30.12.2006.; http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_394/l_39420061230en00100018.pdf
- 3** Rethinking education: Investing in skills for better socioeconomic outcomes; http://ec.europa.eu/education/news/rethinking_en.htm
- 4** OECD Programme for International Student Assessment (PISA); <http://www.oecd.org/pisa/>
- 5** Council Recommendation of 20 December 2012 on the validation of non-formal and informal learning. (Official Journal of the European Union 2012/C 398/01)
- 6** *In this text, the term adult education institution refers (in the narrow sense) to institutions whose fundamental or predominant activity is related to adult education. In the broader sense, the term refers to all other institutions connected to education (secondary schools, higher education institutions, non-formal education institutions).
- 7** The documents are the following:
 - Making a European Area of Lifelong Learning a Reality (2001)
 - Council Resolution on lifelong learning (2002)
 - Adult learning: It is Never Too Late to Learn (2006)
 - It is Always a Good Time to Learn (2007)
 - European Platform against Poverty and Social Exclusion (2010)
 - Youth on the Move (2010)
- 8** http://www.see-educoop.net/education_in/pdf/bela_knjiga-cro-hrv-to2.pdf
- 9** <http://www.zakon.hr/z/384/Zakon-o-obrazovanju-odraslih>
- 10** <http://public.mzos.hr/lgs.axd?t=16&id=15672>
- 11** http://euapp.weebly.com/uploads/1/2/8/2/12824638/deklaracija_o_znanju.pdf



- 12** http://info.hazu.hr/upload/file/Dokumenti/Izjava%20HAZU_Va-znost%20znanja%20i%20oprimjena%20znanja%20za%20izlazak%20iz%20krize%20i%20razvoj%20Hrvatske.pdf
- 13** <http://public.mzos.hr/Default.aspx?art=11662>
- 14** The European Lifelong Guidance Policy Network, ELGPN, <http://www.elgpn.eu>
- 15** http://ec.europa.eu/education/com392_en.pdf
- 16** <http://www.europarl.europa.eu/sides/getDoc.do?language=EN&reference=A6-0304/2008>
- 17** http://www.see-educoop.net/education_in/pdf/01-en_principles_en.pdf
- 18** <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SWD:2012:0374:FIN:EN:PDF>
- 19** Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020')
- 20** European Commission: Rethinking education: investing in skills for better socio- economic outcomes
- 21** Council conclusions of 26 November 2012 on education and training in Europe 2020 — the contribution of education and training to economic recovery, growth and jobs
- 22** National Curriculum Framework for Pre-school Education and General Compulsory and Secondary Education. MSES, 2011
- 23** M. Mourshed, C. Chijioke and M. Barber, How the World's Most Improved School Systems Keep Getting Better, Washington, D.C.: McKinsey and Co., 2010
- 24** School Autonomy in Europe. Policies and Measures, Brussels: Eurydice, 2007; also PISA 2012 Results: What Makes Schools Successful? Resources, Policies and Practices (Volume IV), OECD Publishing: 2003
- 25** See Objective 8 of this Strategy.
- 26** See in particular Objective 8.2 of this Strategy.
- 27** The term 'educational outcomes' refers to more broadly defined outcomes that should be acquired through the formal educational system. This is especially important when it comes to the pedagogical dimension of all levels of education and to educational outcomes that are not directly related to teaching, such as creativity, metacognition, initiative, enterprise,

etc. The term 'learning outcomes' is more directly related to the process of teaching and learning in schools and is more closely linked to dominant forms of validation and assessment such as written and oral examination.

28 Since the strategic objective 'Implementation of a comprehensive curricular reform' has been recognised as one of the strategic priorities whose implementation should begin immediately after the adoption of the Strategy for Education, Science and Technology, the sub-objectives and specific measures are designed as part of a comprehensive project with precisely defined deadlines and a high level of specificity.

29 In the text, the terms 'early childhood and pre-school education' and 'primary education' are used. At the level of secondary education, the terms 'grammar school (gymnasium)', 'vocational education' and 'art education' are used, by which the pedagogical dimension of different types of secondary education is not neglected.

30 It is important to emphasise that the area and subject/modular structure, as well as the number of hours on particular levels and in particular types of education, are not defined by this Strategy.

31 Eurydice (2013). Compulsory Education in Europe 2012/13

32 Eurydice (2013). Recommended Annual Taught Time in Full-time Compulsory Education in Europe 2012/13

33 In this part of the text, all persons responsible for teaching and learning by the end of secondary education, regardless of whether early childhood and pre-school education, primary education or secondary education is concerned (including technical, professional and art education), are referred to as teachers (in accordance with Recommendation Concerning the Status of Teachers, UNESCO, Paris, 1966).

34 EC (2012). Communication Supporting the Teaching Professions for Better Learning Outcomes, http://ec.europa.eu/education/news/rethinking/sw374_en.pdf

35 Eurydice (2013). Key Data on Teachers and School Leaders in Europe. Luxembourg: Publications Office of the European Union. http://eacea.ec.europa.eu/education/eurydice/documents/key_data_series/151EN.pdf

36 Statistical Yearbook of the Republic of Croatia (2012). Zagreb: Croatian Bureau of Statistics, http://www.dzs.hr/Hrv_Eng/ljetopis/2012/sljh2012.pdf

37 OECD (2012a). PISA IN FOCUS — Does performance-based pay improve teaching? <http://www.oecd.org/pisa/pisaproducts/pisainfocus/50328990.pdf>





- 38** OECD (2012b). PISA IN FOCUS — Does money buy strong performance in PISA? <http://www.oecd.org/pisa/pisaproducts/pisainfocus/49685503.pdf>
- 39** NCVVO data, http://www.ncvvo.hr/drzavnamatura/c/portal/layo-ut?p_l_id=PUB.1001.21.
- 40** OECD Programme for International Student Assessment (PISA). <http://www.oecd.org/pisa/>
- 41** Baranović, B., Domović, V. Vizek Vidović, V. (2013). Changes and developmental directions in contemporary education, in: Milanović, D. Bežen, A. Domović, V. (ed.) Teaching methods in the contemporary education system, Zagreb: Academy of Educational Sciences (7–25).
- 412** ETUCE (2008). Teacher education in Europe, Brussels: European trade union committee for education and *Comité syndical européen de l'éducation*. http://etuce.homestead.com/Publications2008/ETUCE_PolicyPaper_en_web.pdf
- 43** Vizek Vidović, V. (ed.) (2005). Lifelong learning of teachers — multiple perspectives, Zagreb, Institute for Social Research in Zagreb.
- 44** ETTA (2013). Analysis of the existing ETTA system of in-service training of educational staff and estimation of needs for in-service training of educational staff, Zagreb, http://www.azoo.hr/images/pkssuor_dokumenti/130429_C1_Analiza_AZOO_INSETT_syste_m_TNA_fin_comp_l_HR.pdf
- 45** Eurydice (2006). Quality Assurance in Teacher Education in Europe. <http://www.cen.eu/cen/Services/Education/Educationaboutstandards/Documents/11.QualityAssurance>
- 46** Domović, V. (2011). Teaching profession and the professional identity of teachers. In: Vizek Vidović, V. (ed.): Teachers and their mentors. Zagreb: Institute for Social Research, p. 12–37.
- 47** C (2011b). Position of the Commission Services on the development of Partnership Agreement and programmes in the Republic of Croatia for the period 2014–2020. http://ec.europa.eu/regional_policy/what/.../partnership/hr_position_paper.pdf
- 48** Hattie, J. (2003). Teachers Make a Difference. What is the research evidence? Australian Council for Educational Research. http://www.acer.edu.au/documents/Hattie_TeachersMakeADifference.pdf
- 49** Fullan, M. (2001). The New Meaning of Educational Change (3rd ed.) Teachers College Press, Columbia University. New York, NY.
- 50** Donaldson, G. (2010). Development of national teacher qualification frameworks across. Five Balkan countries (working paper — ATEPIE project)

http://www.cep.edu.rs/sites/default/files/teacher_qualifications_in_five_balkan_countries.pdf

51 EC communication (2012). Supporting the Teaching Professions for Better Learning Outcomes, http://ec.europa.eu/education/news/rethinking/sw374_en.pdf

52 OECD (2013). Synergies for Better Learning — An International Perspective on Evaluation and Assessment. Chapter 7: The appraisal of school leaders: Fostering pedagogical leadership in schools.

53 Day, C., P. Sammons, D. Hopkins, A. Harris, K. Leithwood, Q. Gu and E. Brown (2010), 10 Strong Claims about Successful School Leadership, National College for School Leadership, Nottingham.

54 Barber, M. and Mourshed, M. (2007). How the World's Best-performing School Systems Come Out on Top.

55 European Commission (2013). Reducing early school leaving: Key messages and policy support — Final Report of the Thematic Working Group on Early School Leaving

56 Ristić Dedić, Z., Jokić, B. (2011). Efficiency of preventive measures in Croatian educational system, MSES, internal report

57 Government of the Republic of Croatia (2003). National programme for Roma people, <http://www.vlada.hr/nacionalniprogramromi/nacprog-zarom.htm>

58 Government of the Republic of Croatia (2005). Decade of Roma Inclusion 2005–2015 Action Plan — Education, <http://public.mzos.hr/lgs.axd?t=16&id=14321>

59 In the school year of 2005/2006, 106 111 children were included in pre-school education, whereas in the school year of 2012/2013 the number rose up to 128 046 children (CBS, 2006 and 2013). In the school year of 2004/2005, 391 112 students were enrolled in primary schools, and in the school year of 2012/2013 the number decreased to 334 070 (CBS, 2006 and 2013). In the school year of 2004/2005, 188 677 students were enrolled in secondary schools, and in the school year of 2012/2013 the number decreased to 184 793 (CBS, 2006 and 2013).

60 According to population projections, by 2021 the number of children and youth aged 0–19 will decrease by 86 840 compared to 2011. Out of the total number, 21 752 are children aged 0–4, 1 915 are children aged 5–9, 22 990 are children aged 10–14 and 40 183 are children aged 15–19 (Akrap and Čipin, 2013).

61 The State Pedagogical Standard of Primary Education (2008), Article 28





62 Adapted in accordance with: The European Qualifications Framework For Lifelong Learning (EQF). Luxembourg: Office for Official Publications of the European Communities — Annex III — Common Principles for Quality Assurance in Higher Education and Vocational Education and Training in the context of the European Qualifications Framework.

63 ETTA (2013). Analysis of the existing ETTA system of in-service training of educational staff and estimation of needs for in-service training of educational staff, Zagreb, http://www.azoo.hr/images/pkssuor_dokumenti/130429_C1_Analiza_AZOO_INSETT_syste_m_TNA_fin_comp1_HR.pdf

64 The existing Department for the development and information infrastructure of the education system performs some work from the scope of quality assurance. However, it does not necessary have the competences and capacities for system management and should be renamed, its jurisdiction clearly defined and human resources strengthened.

65 Principles and approaches used for external evaluation of schools can also be used for external evaluation of pre-school institutions and student dormitories.

66 Faubert, V. (2009), School Evaluation: Current Practices in OECD Countries and a Literature Review, OECD Education Working Papers, No. 42, OECD Publishing. <http://dx.doi.org/10.1787/218816547156>

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