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eScho🌍l4S

DANUBE REGION strategy
People & Skills

Croatia Country Report, WP4

Baseline study on the state of innovation in the thematic fields of the *eSchool4S* network
2014-08-20

Objectives:

Give a comprehensive up-to-date overview on the current status of innovation in the thematic fields of the eSchoo4S network

1. Introduction

1.1. Main characteristics of national education system

The institutions in charge of monitoring, evaluating and improving the educational system in Croatia are:

At the level of legislature, development strategy and funding:

Croatian Parliament with National Council for Information Society, National Science Council, National Council for Higher Education, National Sports Council; Government of the Republic of Croatia and Ministry of Science, Education and Sports with Council for Pedagogical Standard, Croatian Innovation System Council, Government administration offices on the county level and in the City of Zagreb, together with the administrative departments with jurisdiction over education, local self-government offices with jurisdiction, National Council for Curriculum, National Council of Pupils, National Bologna Follow-Up Group, Teacher Council for the Implementation of the CNES.

At the level of monitoring, evaluation and system development and program implementation: Agency for Vocational Education and Training and Adult Education, Agency for Science and Higher Education, Business Innovation Centre of Croatia - BICRO Ltd., Central Bureau of Statistics, Croatian Academy of Sciences and Arts, Croatian Academic and Research Network – CARNet, Croatian Accreditation Agency, Croatian Institute of Technology Ltd. – HIT, Croatian Olympic Centre Bjelolasica, Croatian Standards Institute, Education and Teacher Training Agency, Meteorological and Hydrological Service, "Miroslav Krleža" Lexicographical Institute, National Centre for External Evaluation of Education, State Intellectual Property Office of the Republic of Croatia, State Office for Metrology, The National Foundation for Science, Higher Education and Technological Development of the Republic of Croatia, The National Foundation for the Support of Pupil and Student's Standard, University Computing Centre - SRCE, Zagreb University.

At the level of institutions: kindergartens, primary schools, secondary schools, higher education institutions, scientific institutes and technology and research development centres.

Other organizations related to education system are: Association of Croatian Secondary School Principals, Croatian Association of Primary School Principals, Centre for Educational Research and Development.

Legislature and development strategy are made at the level of Croatian Parliament and Ministry of Science, Education and Sports. The Ministry of Science, Education and Sports is the institution responsible for the quality of education monitoring. Ministry's goal is to enable everyone, under equal terms and according to one's capabilities, to acquire knowledge and skills required for work or continuation of education.

On the operative level, concerning monitoring, evaluation and system development, Education and Teacher Training Agency is responsible for monitoring and serves to ensure education quality, teachers' advancement and professional development of the teachers. Education and Teacher Training Agency conducts studies and sets priorities upon the results of the studies. The organization of quality monitoring, teachers' advancement and professional development is carried out according to priorities.

National Centre for External Evaluation of Education monitors and evaluates state graduation exams in high schools and exams on national level. The state graduation exams are indicators of the results of education on a national level.

The institutions cooperate closely on various strategies, action plans and agendas concerning development and improvement of Croatia's educational system. Their cooperation depends upon the current needs and tasks which need to be carried out. They cooperate at the levels of management and tasks organization to set out priorities and decide which institutions and organizations will implement decisions and carry out actions.

According to results of International Student Assessment (PISA) in 2012, which is conducted in the member countries of OECD (and partner countries), Croatia falls in the middle range. The assessment was conducted in 65 countries and tested mathematics, reading, science and problem solving in students 15 years old. In mathematics, Croatia scored below the average (and was placed on 40th place). In science and reading, Croatia scored below the average (placed in 34th place and 35th place respectively).

While the results of PISA 2012 show results below average of OECD countries, it should be noted that Croatian students achieve great results in International Mathematical Olympiad and International Olympiad in Informatics. There are outstanding individual cases with extraordinary results, be it students, teachers or even schools.

1.2. Existing strategic documents in the field of education

National and strategic documents in the field of education in Croatia are: Law on Education in Primary and Secondary Schools; Strategy for the Making and Development of the National Curriculum for Preschool, General Compulsory and Secondary School Education; National Curriculum Framework for Preschool Education, General Compulsory and Secondary School Education; Strategy for the Education, Science and Technology; Croatian Qualifications Framework Act; Croatian Qualifications Framework; National Programme of Education for Human Rights and various statutes and decisions drafted and issued by Ministries and Agencies.

General aims acclaimed in these documents are: to ensure systematic education of students, to nurture and entice intellectual, physical, aesthetic, social, moral and spiritual development – according to their abilities and aptitude, to raise and educate students in line with general cultural and civilizational values, human rights and children rights and to enable them to live in a multicultural world. To ensure basic, general and expert competences and to capacitate students for life and work in an always changing socio-cultural context. To ensure equal rights and conditions of learning and teaching and to improve the Croatian educational system according to European standards. To establish an effective network of educational institutions and programmes, develop a system of quality insurance on all levels of education and to support inclusive education, lifelong learning and adult education. Certain documents stress the importance of openness to change and continuous innovation in lieu with changes and development of the society, therefore it is essential that national curriculum is continuously revised. Decentralization and democratization of these

processes mean that the responsibility for the changes lies on teachers, experts, principals, but on the parents, students, local and regional community and social partners as well.

1.3. E-learning and Sustainable development in context of existing strategic documents.

National strategic documents stress the need to educate students on ICT, to use ICT to enhance teaching process in primary and secondary schools and to create schools that are technologically developed and prepared to implement e- projects. They also address the concept of sustainable development.

Digital competences are one of the most important competences in the Croatian curriculum. The access to information and communication technology must be available to all students and the use of ICT should be a part of the curriculum as an interdisciplinary content or intersubject topic. The students should learn how to effectively use computers and programmes and comprehend basic principles of the computer making. They should also be capable to apply ICT to problem solving in various areas.

National curriculum stresses the importance of sustainable development: the basic values of National curriculum are derived from the dedication to a wholesome development of the students for an European co-existence and a society which will enable sustainable development. Sustainable development is also a connection among various relations and problems of environment, nature, economy and culture. Through sustainable development education the students will learn to understand the complexity of social, economic and technological development and develop a positive value system with regards of environment quality preservation and rational usage of nature's resources. The values that are crucial are: care, moderation, frugality, solidarity and respect for themselves and other people, the nature and environment, biological and cultural diversity of the planet Earth.

Action Plan for Education for Sustainable Development states that there is a variety of themes and content related to sustainable development covered by schools, but there is still a lot of work to be done if we are to implement the competences as defined by UNECE Strategy. The goals of the Action Plan are to achieve understanding and acceptance of sustainable development concept which requires a shift in the existing educational paradigm from transmission and learning of facts to education which requires critical reflection, thinking and drawing conclusion about issues related to work and life so that the students can understand the reality and interrelations of the environment, society and economic development. Education for sustainable development is a lifelong learning process which includes different types of education: formal, non-formal and informal. Schools have the key role to prepare young people for inclusion into the society in which they will assume responsibility for a constructive development of the society. The content should be placed within a wider context of sustainable development, but the interconnectedness between themes is vital to education for sustainable development.

2. National capacities for e-learning

2.1. Overview of national data concerning technical capacities for e-learning

All elementary and secondary schools in the country are interconnected via the academic research network (CARNet). The schools are connected using various technologies (optic, ADSL) with varying connection speeds.

A separate project was conceived with the aim of improving and advancing the educational process on the islands, and in so doing, encourage the inhabitants of small, remote and poorly inhabited islands to continue to live there. It is conceived on the idea that specially organized classes for "distance education" be organized within the framework of existing schools in larger cities on nearby islands or within the county office. This system allows for the real time transfer of video, audio and other educational material. In this way, 21 schools on the islands have been connected via the video-conference system and the e-islands project.

Any institution of primary, secondary and higher education can be a member of CARNet. Through the membership, they can be constantly connected to the Internet and have the right to use CARNet services. Institutions use various technologies and speeds, depending on the available infrastructure of the provider, their needs, market changes etc. In order to become a member of CARNet, each institution must send an application to the Ministry of Science, Education and Sports.

Individual users (teachers, students, professors, scientists,…) with the electronic identity in the AAI@EduHr system have the access to Internet.

Through GÉANT network all CARNet users can connect with colleagues from over 40 European countries in over 8 000 research and education institutions.

"NET at School" is a project designed by the Ministry of Science, Education and Sports with the goal to enable Internet access in schools and has started in 2003. In the subject of the project, ISDN connection has been installed in all Croatian schools and 1750 computers have been donated. Schools are offered with 10 hours of free Internet access, free usage of disc space for the school website and each school has one e-mail address. The school needs to apply to enter the project and realize the benefits.

According to Digital Agenda for Europe, the state of play of Broadband Development is:
Basic: 2 Mbps for 95% of the population and households since 2012
NGA: 30 Mbps for 19% of the households since 2012
The long term aim for NGA Coverage is 30 Mbps for 50% of the population until 2020.
The technologies used are:

DSL	94,1%
VDSL	15,9%
FTTP	6,2%
WiMax	0,0%

Standard Cable	19,6%
Docsis 3 cable	0,0%
HSPA	93,1%
LTE	25,0%
Satellite	100,0%

Available frequencies are 800 MHz LTE - 900 MHz, 1800 MHz LTE, UMTS - 1900 MHz, 2100 MHz UMTS - 2500 MHz IMT and 3500 MHz WiMAX.

Students use web browsers and social networks on everyday base. They use interactive whiteboards much less frequently than the EU average. Students' confidence in their operational ICT skills is close or below EU mean and is at or above EU mean in social media skills.

The number of school computers is 1 computer classroom per school. The number of computers available is below the EU average at all grades. There are fewer internet-connected desktop computers than the EU average. According to data received from Ministry of Science, Education and Sports there are 44 570 students in high schools and 118 955 students in primary schools attending informatics classes, with 1 236 teachers of informatics.

Although there are studies showing the frequency of use of ICT in lesions is average in comparison to EU standards, our experience shows that e-learning courses are used in pilot projects in schools and are mostly used by pioneer teachers. Croatia ranks below other countries in regards to virtual learning environments.

Outside the informatics (ICT) subject (which is optional subject in primary schools for 5th to 8th grade and a mandatory separate subject in secondary schools), ICT is used in pilot projects in schools and is mostly used by pioneer teachers. Broader implementation of ICT into teaching in schools is still missing. There are 44 570 students in high schools and 118 955 students in primary schools attending informatics classes, with 1 236 teachers of informatics. As the adjustment of the learning process to include ICT is under way, some schools have introduced e-directories for teachers or smartboards and have educated their teachers accordingly.

There is no technical staff dedicated to ICT in schools – the role of technical staff is executed by teachers and/or students themselves.

MS Windows is used in all schools, with the addition of various free software (such as Geogebra). The technical equipment is funded through the funds a school receives from the state or by sponsors (through donations), but the sponsor model is not widespread. The equipment is on average 6 to 7 years old and the replacement is problematic due to economic crisis. The Ministry of Science, Education and Sports has an agreement for software licensing for all schools with Microsoft Croatia.

2.2. Analysis of documents about competencies and teacher and student outcomes regarding ICT use

All Croatian teachers received basic ICT training (basic ECDL programme) as a part of their expert education. The Education and Teacher Training Agency in collaboration with CARNet is working on systematic training of all teachers in ICT, but there are currently no expectations for the use of ICT in examinations and assessment. ICT is a part of higher education for future teachers in university, but teachers lack confidence in operational skills and social media skills.

It is stated that ICT competences are one of the crucial competences which should be in the focus of the new National Curriculum. The access to information and communication technology must be available to all students and the use of ICT should be a part of the curriculum as an interdisciplinary content or intersubject topic. The students should learn how to effectively use computers and programmes and comprehend basic principles of the computer making. They should also be capable to apply ICT to problem solving in various areas and should use it in all subjects in order to research and communicate on local and broader level, to exchange ideas and share their work.

ICT competences are included as interdisciplinary content or intercourse topic, but as key competence as well. Informatics is elective subject in primary school (from 5th to 8th grade) and a mandatory subject in all four years of high school (gymnasium or vocational secondary schools). National Curriculum Framework integrates ICT in many subjects in addition to regular teaching ICT as a separate subject.

Teachers most commonly use PowerPoint presentations as a tool in teaching.

2.3. Identification of current state and rooms for improvement in e-learning: results from interviews with relevant stakeholders

No major improvements have been made in the last five years regarding ICT usage in education. Even though national and strategic documents stress the importance of ICT in education and the development of ICT competences in students, no work has been done on larger scale. Schools depend upon themselves in efforts to implement positive changes and rely heavily upon their staff and skilled students. Some schools have introduced e-directories and smartboards.

The methods of the usage of ICT in education are lacking. Teachers require training and examples of good practice and time and room to experiment personally with the possibilities of ICT application in their own subject(s). There is also a problem of procurement of hardware and continuous update of software used in schools.

There are goals regarding ICT usage in education set out in National Curriculum: the students should learn how to effectively use computers and programmes and comprehend basic principles of the computer making. They should also be capable to apply ICT to problem solving in various areas and should use it in all subjects in order to research and communicate on local and broader level, to exchange ideas and share their work. The goal is to create high-tech schools which are prepared to implement e-projects. In order to achieve this goal, schools must have high-speed Internet, enough of the equipment and they must computerize the processes of teaching, learning and management. This should be achieved through the cooperation with CARNet and structural funds.

3. Sustainable Development (SD) in Education

3.1. Representations of SD themes in national curriculum

The sustainable development themes are present in the Croatian National Curriculum. They are not included in one separate subject but are rather distributed among various subjects. The number of themes and their teaching differ by types of secondary schools and differ in gymnasiums and vocational schools.

Some of the themes present are: environment protection, nature conservation and management of natural resources, biological and landscape diversity, renewable energy sources and energy efficiency, waste management, corporate social responsibility, sustainable production and consumption, informing consumers and consumers' rights, certification, cleaner production, building peace, non-violence, democracy, justice, human rights, security, ethics, political literacy and political participation, global, national and local responsibility, democratic citizenship, local, regional, rural and urban development, social inclusion, quality of life, intersectoral partnership, information and education on disease prevention, healthy lifestyles, public health, protection of cultural and traditional heritage etc.

It is difficult to assess in which subjects and to what extent are the sustainable development themes present in the national curriculum, given the fact that Croatian National Curriculum has not defined the quantity of themes in any given subject and has not defined the methods of teaching the sustainable development. There are no documents on national level that define which topics of sustainable development are to be covered by which subject, to what extent and in which way. National Curriculum has set out the guidelines for nature and science subjects, but the Croatian Qualifications Framework has the opportunity to define the criteria of sustainable development teaching and assessing. Many subjects in gymnasiums and vocational schools include some sustainable development themes.

Some subjects may cover similar or same themes, but from a different standpoint. For now interconnections through subjects are a question of individual engagement and are relying on particular schools and teachers which may agree to adapt their curricula to accommodate interconnectedness. The interconnectedness is still a desired model, but one we have yet to achieve on a national level.

3.2. Identification of new arisen important themes of SD that should be included into national curriculum: results of interviews with stakeholders

All the themes listed by the UNECE are important, but the problem arises from lack of a defined working framework. There is no regulation of the teaching process for sustainable development, no methods recommended, no criteria for the assessment and the interconnectedness of the subjects teaching sustainable development remains undefined.

Some of the themes pointed out are: citizenship, democracy and government, human rights, elimination of poverty, biodiversity, environment protection, climate changes, environmental health, corporative and social responsibility.

3.3. Teacher's and view about e-learning and SD: results of focus group with teachers and students

Education of teachers for sustainable development is not consistent. There are some optional courses on certain universities, but for the most part the themes of sustainable development are integrated into different courses, much like in the secondary education system. Informal education in Croatia still remains unrecognized and is rarely used as a method of education for sustainable development. The Education and Teacher Training Agency has developed a number of modules and projects for concrete application of civic education in schools and the local community.

E-learning is still underrepresented in education of teachers and general competences for e-learning are under EU average. Much work needs to be done so that teachers learn and gain confidence in using e-learning. Again, it depends on individuals and their personal aptitude towards new methods and their implementation in everyday work.

Majority of teachers lack experience in using web classrooms and cooperation on international educational networks. Teachers with such experience, which they have typically attained through cooperation on an EU-funded project, have applied for the eSchool4S project because they recognized this project as a continuation of their education in the field of ICT in teaching. It seems there is still a large number of teachers not interested in expanding their ICT knowledge (outside the basics) or intimidated by the concepts of web-based classroom. In the interviews with stakeholders and teachers which applied for cooperation on eSchool4S project the major problem is not so much ICT knowledge and competences, but the knowledge of English language (as the official language of the project).

Teachers generally express positive attitude towards e-learning, but there is a lack of implementation of e-learning in the Croatian education system.

Teachers in general are aware of the importance of sustainable development in teaching. The concept of sustainable development is heavily stressed in Croatian National Curriculum and the Action Plan for Sustainable Development is ongoing. But as the operational development of the implementation of sustainable development into classrooms is missing, the obligation to follow certain guidelines is lacking. Therefore it is up to every teacher to decide how much of importance he or she will give to themes of sustainable development in their teaching. It is also up to every school and its teachers to decide whether and to which extent will the themes of sustainable development be interconnected between subjects.

Teachers already include the sustainable development themes into their subject's curriculum. Teachers which applied to join the eSchool4S project in Croatia are prepared to do more: to include more themes or to include them in a new and different way.

Some teachers are already involved in European projects and want to continue their participation in them, some have personal interest in the topics of e-education and sustainable development with significant experience in e-teaching so they see this project as a continuation of previous learning and experience. They see the project as a way of personal and professional development and aim to enrich their range of skills, develop their competencies and implement new methods and strategies to teach more successfully. They also search for ways to more directly involve students into the learning process and to teach them real, practical issues and problem solving. They see sustainable development as crucial element of teaching for progress and a better world. They search for ways to ignite the consciousness of the importance of sustainable development in their students. Many are

interested in international cooperation and are excited about the possibilities of cooperation and exchange of ideas with colleagues on international level. They are interested in new ideas and concepts on how to improve life standard of impoverished population and to raise awareness in students on the importance of environment protection and its connection to quality of live enhancement. They are looking for way of implementing sustainable development into classroom and ways to make it more interesting to students. Some teachers have participated in and even coordinated projects and are willing to share their knowledge and experiences with other teachers. Others are looking for ways to include students in international projects. They want to improve their ICT competences and hear about the experiences of their colleagues in other countries.

4. National conclusions and recommendations:

National strategic documents set out a number of goals for the Croatian education system and they must be achieved. More agility of the institutions in charge in the implementation of these strategies is badly needed – the resolutions need to be passed more quickly and the implementation needs to be more efficient and in a shorter period of time. Constant revisions of the National Curriculum are necessary to follow socio-economic development and the Curriculum needs to be more specific and to the point in order to become a reference point for all institutions involved, as well as the teachers. A need to include local communities, regions, parents and students needs to be addressed with practical guidelines and recommendations.

The processes already are under way must continue: computerization of schools needs to be carried out on larger scale, systematically and consistently (e.g the e-directories should become a standard, not an exception), followed by appropriate technological solutions and teacher training. There is much room to improve the equipment in schools (both hardware and software), as well as the connection to the internet (namely, internet speed). The lack of hardware and software needs to be addressed (perhaps through new models of procurement) and software needs to be regularly updated.
Ministry of Science, Education and Sports has no data on the number of computers per student in schools, the level of ICT usage in teaching is below EU average and the usage of e-learning is still in its early stages, implemented only within certain projects and not as a widespread method of teaching.

The concept of sustainable development is valued as very important in the Croatian education system, cited as a high priority, and is accompanied with an Action Plan. Despite recommendations and plans, sustainable development topics are not yet an integral part of classes. It is an interdisciplinary, cross-curriculum concept, but there are no parameters to measure its incorporation into subjects. Therefore it is difficult to assess how much are topics of sustainable development present in the classroom which leads to various interpretations: some express the opinion it is very well represented, some oppose it.
It is certain there is a need to change the paradigm of teaching: the education system on the whole needs to make a shift from a transmission of facts to teaching which results in critical thinking, reflection and arriving at conclusions based on available facts. The shift is necessary so that the students can understand the complexity of sustainable development issues and how they relate to environment, society and economic development. The sustainable development topics and issues need to be placed in a wider context and their interconnectedness must be clear to students.

According to stakeholders, the new National Curriculum should be the driver of change, a chance to implement the above stated requirements. There are no indications this will ensue, as the document lacks deadlines or outcomes. The new Croatian Qualifications Framework has set out outcomes of teaching, but they are not expressly linked to sustainable development.

One of the most prominent problems is lack of teaching methods which incorporate ICT into classroom. Teachers need training, examples of good practice and enough time and space to experiment with methods. There are no guidelines of the teaching process for sustainable development, no methods recommended, no criteria for the assessment and the interconnectedness of the subjects teaching sustainable development remains undefined.

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6. List of stakeholders

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