
Primary school education system in Croatia – improvements through a strategic management model (case study)

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Abstract: In the process of EU accession the Republic of Croatia is endeavouring to meet the new requirements for improving the education system. This presents an opportunity for changes in the education system, by embracing and conducting a process of strategic thinking aimed at enhancing all of the segments in the Croatian education system. The ultimate goal is to help create a more efficient and more competitive economy.

Usage of ICT in education is a major strategic feature of quality education, development, and employment possibilities in a competitive market economy. All education systems face the challenges and requirements of the information society, and use of ICT to make knowledge, information, and education more accessible, as well as to provide life-long learning and education.

The paper aims to investigate the education system efficiency through the usage of ICT, and is based on empirical research.

Keywords: ICT; efficiency; primary school education; human resources; knowledge; Croatia.

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1 Introduction

In the conditions of great changes and an increasing market globalisation, the Croatian education system should be modified and harmonised with education systems of the developed countries that have knowledge-based economies (Lamza-Maronić et al., 2009). One of the elements of the competitiveness of the national economy is the knowledge and expertise level of the workforce. The workforce in the Republic of Croatia is in the process of upgrading the necessary knowledge and abilities required by the contemporary competitive economy. EU accession of the Republic of Croatia establishes further requirements in improving the education system. A unique opportunity is thus offered to change the education system by accepting and introducing the process of strategic thinking into all the segments of the Croatian education system. The goal is to create a more efficient and more competitive economy.

2 The importance of human resources in the education development strategy

According to the 2001 census, the population of Croatia was 4,437,475 with overall population density of 78.40 inhabitants per square kilometre. The population has been stagnant in the last decade, and natural population growth is currently negative.

The Eurostat data indicate that the Croatian PPS¹ GDP per capita was 63% of the average GDP in the European Union in 2008. In 2009, ILO² – the unemployment rate was 9.1%, whereas the recorded unemployment rate in August 2010 was 16.4%.

Over the past few years, i.e., since 2007, classes in Croatian schools averaged 20.6 pupils. In 269 branch (rural) schools there were fewer than ten pupils per class³.

In the whole of Croatia, there are 54 schools with adaptations for primary school students with motor impairment. Furthermore, Ministry of Science, Education and Sports in cooperation with local communities is currently conducting the project aimed at constructing a network of schools without physical barriers.

Human resources should be redirected to knowledge-based jobs, whereby economic growth through innovation might be achieved (Bejaković, 2006.). Current and future workforce should be trained to change jobs with ease, to manage their work environment, and to participate in life-long learning. Pupils, students and employees should learn how to work together by strengthening the team spirit and adequate social behaviour, which will at the same time allow for development of personal affinities and talents. One of the foundations for development of the competitiveness of human resources is the quality of the education system at primary school level. For this reason, it shall be in the focus of this paper.

Continuing education and skill improvement of employees seems to be one of the most important forms of management and development of human potentials, and through this also one of the most efficient ways of achieving competitive advantages.

By conducting the strategic adjustment of education plans and curricula, the Croatian education system should discard the system of peripheral memorising of facts, the discipline and classic teaching methods and shift to the system that satisfies the needs of democracy with a globally integrated free market.

Although relatively large funds are intended for education, Croatian schooling system is burdened with the existing network of schools which is not optimal and use of the funds is not efficient. The reason for that is the existence of a large number of small and local schools that generate large costs, while at the same time they have a small number of students, lack sufficient equipment and the teaching mostly performed in combined classes. One of the most important strategic activities should start with the implementation of the newly adopted, the Croatian National Educational Standard for the Primary Education⁴, according to which the existing network of primary schools in the Republic of Croatia would be adjusted.

Application of information and communication technologies in education is an important strategic element in the quality of education, development and employment in a competitive market economy (Strugar, 2006.). Education system should be faced with the challenges and needs of the information society. The opportunity offered by information and communication technology in terms of availability of knowledge, information and the possibility for life-long learning and education should be used. Information and computer literacy today is as necessary as the general literacy and in that segment the strategic adaptation of the system is required.

The right to education is one of the basic human rights. Compulsory education in as equal terms as possible for everyone is guaranteed by the Constitution of the Republic of Croatia (Article 65 of the Constitution). Primary school education is a prerequisite for every other education and it is the foundation for the life-long learning. The key competences that make citizens capable of fulfilling functions in the knowledge society are acquired in the primary school education.

The quality of the system that may produce competitive knowledge in the future, which would then be the base for further development of the Croatian economy, can be improved by strategic thinking about the development of the Croatian education, starting with the primary school education.

3 Prerequisites for the development of the education system

Education system, that is, the system of upbringing⁵ and education⁶ encompasses all those elements (means, content, organisation, work methods and evaluation forms, equipment and teachers) that act in both direct and indirect way, dynamically and known in advance in terms of time, toward achieving the purpose and tasks within the school system and all its forms with the purpose of providing education for young generations at various levels [Mijatović, (1999), p.293].

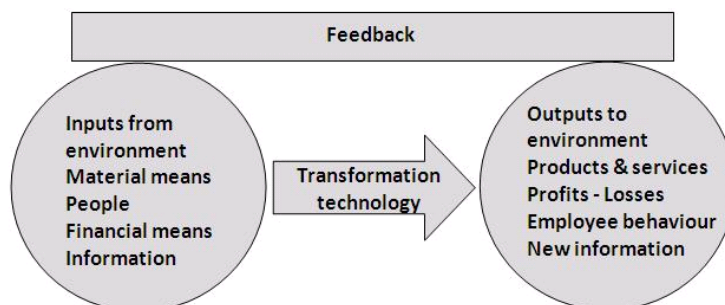
The main determinants of the education system⁷ can be expressed as a sequence of mutually connected, conditioned and dependent elements that act purposefully toward the set goal. They can be divided in four groups [Mijatović, (1999), pp.295–296]:

- a technical, material and financial prerequisites
- b programme and content prerequisites
- c personnel prerequisites
- d regulatory, controlling and directing prerequisites.

Elements of the system education model are analogue to the elements of the general framework for system analysis of the organisation. These are [Pastuović, (1999), p.120]:

- 1 educational organisation
- 2 environment of the educational organisation
- 3 inputs into the educational organisation
- 4 outcomes of the educational process and outputs from the educational organisation
- 5 feedback.

Figure 1 General view of the organisation as a system



Source: Pastuović (1999, p.118)

Efficiency of education and upbringing is reflected in the level of realisation of its goals (Lamza-Maronić and Glavaš, 2008). Efficiency of the system depends on to what extent individual elements of the system are formed according to the system goals and to what extent elements of the system are mutually harmonised so that the system would act as a harmonised unit. Education is an open social subsystem that, like all social subsystems, consists of 'inputs' in the system, organisation of the system in which transformational (organisational) processes take place by means of which inputs turn into the desired 'outputs'. An important element of the open system is the feedback by means of which the information about the outcomes of education and upbringing (knowledge, skills, values and attitudes, that is, various qualifications) and about the effects of the system to the environment subsystems is obtained.

The central element of the education system is the organisation of the system – so that in comparative international analyses the systems are compared according to their organisational structure. Such comparative accounts were used in the analysis (Ministry of Science, Education and Sport, 2002; Die Schulsysteme Europas, 2004). As the elements of the system are in interaction and they have to be harmonised as much as possible, the quality of the system structure depends on its suitability to goals, i.e., to what extent the organisational structure of the system presents an adequate framework for a successful learning/teaching process as the central process in an educational organisation (by which education is distinguished from other social subsystem).

As the mandatory primary school education is the foundation of the whole education system, its properties reflect on the efficiency of life-long learning by means of which members of a community are trained to live in the knowledge society and knowledge-based economy. For that reason, it is important to research how structural properties of the mandatory primary school education influence the abilities of people to build a learning society, i.e., the knowledge society and knowledge-based economy (Mijatović, 1999).

4 Possibilities of ICT application in the primary education

School network⁸ is the starting point that defines the condition and development of primary schools in the Republic of Croatia as well as in the area of Brod-Posavina County. The school institution network in the Republic of Croatia is not optimal. Brod-Posavina County has 24 primary schools that have 69 local departments. This is an example of a county that has uneven conditions for growth and development of children, as well as questionable efficiency and quality of the lessons, especially in combined classes. In the school year 2008–2009 there are 9,692 pupils in 492 regular and 80 combined classes (Vukašinović, 2009).

At the level of the Republic of Croatia, the Croatian National Educational Standard for primary education was adopted, which makes it possible to bring school networks to the local level. The system is too huge, which makes it too expensive and inefficient. The knowledge level created in the existing organisation of primary schools in the Republic of Croatia is not sufficient to prepare Croatia for the conditions of fast social and economic changes. Therefore, efficient change in the planning of the education system development is required. Optimisation of the school network refers in the first place to primary school institutions, because primary school is mandatory and non-selective, so

the state should do whatever it can to ensure conditions for all of the children be the same so they can successfully complete primary education.

Optimisation of school networks includes school schedule issues and research and improvement of 'external learning conditions' at schools: buildings, equipment and the quality of the teaching staff. This is the foundation for planning focused investments in the improvement of learning conditions in order to reduce regional differences and differences among schools in education achievements of the pupils. As long as there are large differences in the education standards, introduction of exterior evaluation raises dissatisfaction of those educational environments that are objectively in worse position.

To adopt the school network proposal in the Republic of Croatia as well as on the area of Brod-Posavina County, adequate adjustment should be made in terms of harmonisation with the new education standard. The main prerequisites for this should be provided, and these include spatial, material and personnel conditions. This means adding new spaces to make it possible for schools to work in one shift, to provide funds for transport of children from local to central schools, provide funds for professional training and additional education of personnel with the aim of increasing efficiency of the education process. The goal of the school network optimisation is to improve availability and quality at the national level, while minimising the differences among schools. In countries with the most advanced education systems it is almost irrelevant what primary school does a pupil attend, because he or she will acquire almost equally good knowledge in any of them. Human potentials are best used in this way to the benefit of every individual and the society as a whole. Optimisation includes establishing of a full and easily searchable *database*, which provides:

- constant monitoring of the network
- updating the base with new data
- rational adoption of various education-related decisions.

In order to make rational optimisation decisions and ensure rational education policy, the systematic approach in gathering education data is applied, which includes the indicators of the main system elements: inputs in the system, processes in the system and outcomes and outputs from the system, and relevant data on education environment. Modern information technology is used in the process. Among other, it makes it possible to easily conduct geospatial analyses. This is a tool without which it is not realistic to expect a successful optimisation of school networks and improvement of education quality for everyone as a part of a permanent process. EMIS, *education management information system*, which is applied in a large number of countries, is established (Hua and Herstein, 2003). Not only that EMIS is a comprehensive database about education and its environment, but it is also a group of formalised procedures by means of which information about education are analysed, integrated and disseminated for the purpose of making decisions about education at various levels of the education system. Optimisation does not only consist of building new and closing down some other schools, but it is also the process of ensuring excellent education for all. For this reason, in order to make the best decisions about optimisation, it is necessary to have data on all the aspects of the

education system which affect the availability and quality of education. Optimisation success also depends on the attitudes of the local interest groups that affect acceptance and success of optimisation measures.

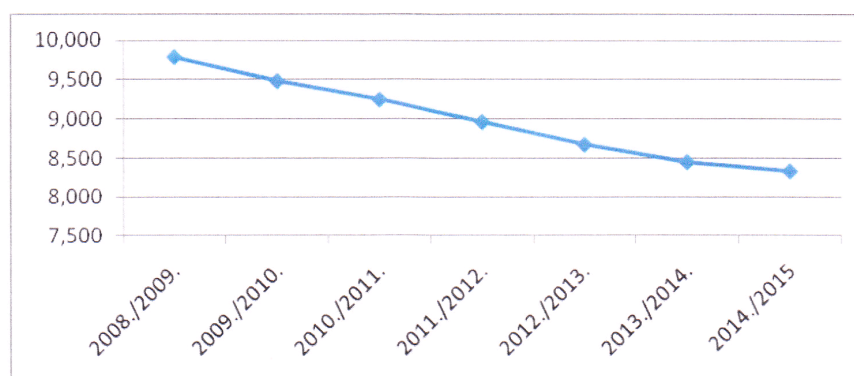
The decreasing tendency in the number of born children in the Republic of Croatia, unfortunately, supports the optimisation of the school network. It is reflected in the reduced number of children enrolled in the first year classes, especially in small local schools, which leads to their closing.

Table 1 Envisaged number of school children and young people for the period 2000–2020

Age	2000	2010	Change 2000–2010/%	2020	Change 2000–2020/%
7	47,000	43,000	–8.5	39,000	–17.0
8–10	198,000	178,000	10.0	165,000	–16.7
11–18	479,000	365,000	–23.8	336,000	–30.0
Total number of pupils	724,000	586,000	–19.5	540,000	–25.4
Total population	4,380,000	4,285,000	–2.2	4,158,000	–5.1

Source: Ministry of Science, Education and Sport (2005)

Figure 2 Graphic account of the projection of the number of primary school pupils in Brod-Posavina County in the period from 2008 to 2015 (see online version for colours)



A 5.1% decrease in the total population of Croatia in the period from 2000 to 2020 is envisaged, which is a fall from 4,380,000 in 2000 to 4,158,000 inhabitants in 2020 (World Bank, 2004).

Optimisation decisions should be based on the data showing the accessibility of a school for a pupil and the data that are indicators of education quality in some schools, all that in short-term, medium-term and long-term perspective. The most important categories of optimisation parameters are demographic, geographic, economic, and cultural and education data.

Table 2 SWOT matrix at the level of Brod-Posavina County

<i>Internal factors</i>	
<i>Internal strengths (S):</i>	<i>Internal weaknesses (W):</i>
<ul style="list-style-type: none"> • The existing education system • Acceptance and implementation of EU standards in the education system • Implementation of projects supporting a continuous education process • Stimulation of research processes • Permanent education of young people • The current practice – stimulation programmes for ‘virtual companies’ 	<ul style="list-style-type: none"> • Insufficient number of training programmes for teachers within the education system • Curricula are not suitable for development of pupils’ creative abilities; life-long learning and training are neglected • Infrastructure is not adjusted to the needs of modern education requirements • Weak motivation for higher education • Practical training is not in line with labour market needs • Lack of qualified teachers for particular subjects • Professional education and training provide only teaching of out-dated skills
<i>External factors</i>	
<i>External opportunities (O):</i>	<i>WO strategy:</i>
<ul style="list-style-type: none"> • Foundation of centres for technological development and application of acquired knowledge • Modernisation of basic infrastructure in general and through public-private partnerships • National and international support to creating better prerequisites for development of the education system • Implementation of EU policies in the field of education 	<ul style="list-style-type: none"> • Harmonise and modernise infrastructure through public-private partnership • Modernise professional education and training through foundation of centres for technological development • Adjust curricula to the development of pupils’ creative abilities, motivation for higher education and life-long learning through national and international support for the purpose of creating better prerequisites for development of the education system
<i>External threats (T):</i>	<i>WT strategy:</i>
<ul style="list-style-type: none"> • Lack of sufficient information on the possibilities for using funding from foreign programmes, brain drain • Resistance toward introduction of new skills and technologies • Low potential and improvements in increasing attractiveness of highly professional jobs, slow development of the county • Reduced number of pupils in primary schools, qualified personnel leaving (not returning to their home town), or refusing to accept life-long learning 	<ul style="list-style-type: none"> • Reduce the level of personnel leaving • Reduce resistance toward introduction of new skills and technologies • Reduce the lack of qualified teachers for particular subjects • Discontinue curricula which are not adjusted to development of pupils’ creative abilities
	<i>ST strategy:</i>
	<ul style="list-style-type: none"> • Stimulating research processes to raise interest in introduction of new skills and technologies • Adjustment of the existing education system to provide better acceptance of life-long learning • Implementation of projects supporting a continuous education process with the possibility of using funding from foreign programmes

5 Results of the theoretical research of applying the strategic management model to increase efficiency of primary education

Strategic management is a process of formulating a strategy and adopting an array of management decisions which determine a long-term success of an organisation. Its role refers to a definition of the way of realising a vision, mission and long-term goals of an organisation.

Certain conclusions in relation to the possibility of applying the strategic management model to increase efficiency of the primary education system and education system as a whole can be made based on the theoretical and empirical research that was conducted on a sample in primary school in Brod-Posavina County. To achieve the strategic goals, a SWOT analysis was conducted both at the national level and at the level of Brod-Posavina County. The conducted analysis was used as a starting point for development of a SWOT matrix for Brod-Posavina County with possible development strategies.

Research results have shown that implementation of the strategic management model in primary education institutions would improve efficiency of the education system through:

- a school network optimisation
 - 1 Maintaining the existing schools and improving learning conditions which have impact on the quality of education (school are inadequately equipped with teaching aids and modern IT equipment).
 - 2 Expanding capacity of the existing over-populated schools (only 3 of 24 primary schools work in a single shift).
 - 3 Building new school facilities to solve the problem of over-populated schools (there are four schools with a considerably higher number of pupils than it is allowed by the education standard; new school facilities should solve the problem for those schools. This would require building of 16 schools).
 - 4 Transport of pupils from over-populated schools to branch schools with a smaller number of pupils (only one school has organised transport of pupils to a smaller branch school to reduce the problem of over-population).
 - 5 Closing down smaller branch schools with insufficient number of pupils.
 - 6 Expanding scope of activity in schools to transform them into a local cultural centre (cultural events).
 - 7 Transforming schools into regional development centres (only one school has a practice room for the needs of higher education).
- b pursuing the decentralisation process
- c care of human potential
 - 1 showing real interest for employees as the most valuable assets
 - 2 providing and stimulating systematic training, professional improvement and possibilities for promotion of employees within the school system.
- d use of information and communication technologies
 - 1 Introducing e-learning to schools.

- 2 Providing infrastructure and equipment in schools.
- e Rational conducting of education policy (Pastuović, 2005)
 - 1 Providing conditions to include all pre-school children (age five) in some form of pre-school education (35% of children in Brod-Posavina County are included).
 - 2 Extending the duration of the junior primary school education from four to six years (apply international standard-ISCED (http://www.unesco.org/education/information/nfsunesco/doc/iscsed_1997.htm)).
 - 3 Extending duration of elementary school education from eight to nine years.
 - 4 Making education and hiring of primary school and subject teachers more flexible.
 - 5 Improving implementation of internal differentiation of pupils during the second level of primary school education (ISCED).
 - 6 Providing easier transition among different courses in higher secondary school education (ISCED 3).
 - 7 Improving conditions for formal and informal education of adults (only one school on the area of Brod-Posavina County provides education for adults).

6 Conclusions

The research presented in this paper determined that the essential factors for efficiency improvement in the primary school institutions in Brod-Posavina County are inadequate in relation to the characteristics required by contemporary market conditions.

It would be useful to verify the obtained data by conducting an additional study of organisation of all primary school institutions (in Brod-Posavina County) and to establish the model of organisational solutions. Considering the fact that the influence of local communities is an important factor in making individual organisational solutions for primary school institutions, it would be interesting to conduct a survey of public opinion in all the local environments.

The stated conclusion refers to the discrepancy between the perception of own efficiency and requests imposed by the exterior environment.

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Notes

- 1 Regional GDP is expressed in purchasing power standard (PPS), a statistical indicator that measures the relation between regions through real purchasing power of income, which means that consumer price differences are taken into account.
- 2 The International Labour Organization (ILO) is the tripartite UN agency that brings together governments, employers and workers of its member states in common action to promote decent work throughout the world (<http://www.ilo.org/global/lang--en/index.htm>).
- 3 Draft of the National Educational Standard for Primary School Education in the Republic of Croatia [Ministry of Science, Education and Sports, (2007), p.2].
- 4 The Croatian National Educational Standard for Primary Education in the Republic of Croatia determines the minimum infrastructural, financial, and personnel conditions for realisation and development of activities in as equal conditions as possible for even development on the whole area of the Republic of Croatia. It applies to all primary schools in the Republic of

Croatia, with exception of the schools working according to the alternative curriculum. Adoption of the Croatian National Educational Standard for Primary Education is based on the Article 80 of the Croatian Constitution (Ministry of Science, Education and Sport, 2005).

- 5 Upbringing is an organised (intentional) learning (acquiring or changing) of motives. Learned motives are those characteristics that have a dominant affective or volitional component that is not congenital [Pastuović (1999), pp.42–55]
- 6 Education is a process of organised learning of cognitive and psychomotor personality traits. In addition to the term 'obrazovanje' (education), older Croatian sources also use the terms 'izobrazba' and 'naobrazba'. In newer literature, the term 'izobrazba' has acquired a special meaning, which is narrower than the meaning of the terms 'obrazovanje' and 'naobrazba'.
- 7 The term system denotes a very abstract term. Traditionally, a system is defined as "a sequence of components or elements that interact in order to achieve the common goal" [Husen and Postlethwaite, (1994), 10, p.5895]. Depending on the nature of its components, there are different types of systems: physical, biological, organic, technical, social, etc. A harmonised activity of several people can also be defined as a system. When a group of people works together in order to achieve common goals, then this is a system that we call organisation (Moorhead and Griffin, 1998). Education system has all the traits of an organisation.
- 8 School network is a technical term denoting a system of institutions, their capacity, equipment and human resources that conducts a certain level of education on a certain area. School network is optimal when the ratio between costs and benefits in that segment of education is the most favourable. This means that the desired »outputs« from the system (the number of pupils who graduated and the quality of pupil achievement) are achieved at lowest inputs (costs), that is, effects are maximal in relation to fixed available costs.