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LEGAL AND TECHNOLOGICAL CONDITIONS FOR OPEN EDUCATIONAL RESOURCES IN SERBIA

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Abstract: *This paper presents an overview of the current situation in Serbia regarding the legal and technological conditions for the development of open educational resources. Apart from an overview of the current situation, it includes SWOT analysis that has identified strengths, weaknesses, opportunities and threats. It also proposes ways to overcome the current difficulties that have been identified in the field of open educational resources.*

Keywords: *legal conditions, technological conditions, open educational resources*

1. INTRODUCTION

Education and digital society are a generator of development and improvement of knowledge in the countries of the European Union. In addition to identifying their own goals and priorities, the countries in the accession process adopt strategic plans, thus confirming the policy and the commitment to realize goals that improve the quality of life and strengthen the economic power of the society.

Strategic choices in the field of ICT still lack the adequate implementation in practice. The necessary digital infrastructure is missing. Further, the necessary legislation that would allow full utilization, access and distribution of data based on the standards and platforms of OD (Open Data) and OER (Open Educational Resources) has yet to be adopted. Regulatory harmonization of intellectual property, e-government, and information security is an additional requirement for the application of OER.

The importance of the development of OER in the process of higher education has been confirmed in practice and the experience of the developed countries through the examples that indicate the need for the application of innovative technologies in order to improve the quality of the educational process.

Along with the identification of strengths and weaknesses and the opportunities and challenges in the implementation of OER, the analysis of the current situation should serve as the foundation for the recommended strategies for the improvement of the implementation in higher education.

The method of achieving progress in the implementation of OER software and standards requires the necessary institutional framework and environment within the academic community that, with the support of and cooperation with other social stakeholders, can assure the realization of the European agenda in this field.

2. CURRENT LEGAL CONDITIONS REGARDING OER IN SERBIA

In order to implement and develop OER in Serbia, the legal requirements must be fulfilled at national and institutional level. Apart from the adoption of the existing drafts and enactment of legislation related to open education systems in Serbia, it is necessary to gradually raise awareness about the importance of OER, its possibilities, the method of implementation and development and its usage.

The strategy for development of education in Serbia until 2020 [1] is the starting point for the analysis of legal regulations in the field of OER. The approach to the creation of content of the mentioned strategy is based on the openness of the system of education, while its development is formulated from the perspective of the role it has towards the environment. This strategy overcomes the traditional tendency to have the system of education that is autonomous in relation to the other systems by requiring the system that must be open to all other systems in Serbia. It is this starting point in the strategy for development of education that provides a legal basis for the realization of ideas that are related to OER.

Bearing in mind the successful practice in Europe in terms of implementation of OER, it is necessary to harmonize national regulations in this field. The Law on Higher Education of Serbia [2] governs the alignment with the European system of higher education and the improvement of the academic mobility of teachers and students. It is this principle of the law on higher education in Serbia that provides a starting point for the implementation and development of OER through

alignment with successful European practice and academic mobility in order to share the existing and gain new experiences.

Apart from the mentioned strategy for development of education and the law on higher education, the strategy for development of information society [3], which emphasizes the development of digital educational content as one of the basic goals that should be achieved, is also a significant regulation in this field. The above mentioned strategy refers to the introduction of modern concepts of e-learning and open learning. The basis for the implementation and development of OER was set in accordance with the objectives established by the strategy for development of education.

Examining the existing legal regulations through the mentioned laws and strategies, the conclusions about the needs and demands of the future OER related work are drawn. Existing regulations open up the possibility of development of OER, however, they have yet to be upgraded and harmonized with OER regulations in Europe.

3. CURRENT TECHNOLOGICAL CONDITIONS REGARDING OER IN SERBIA

This chapter highlights the existing platforms that provide foundations for the development of OER. However, before approaching the conditions that are related to the platform, it is necessary to emphasize the need for raising the awareness of the importance of OER in Serbia. To this end, Serbia has already held seminars. In March 2014, the university library *Svetozar Markovic* organized a presentation of the concept of open access to education, open education and massive open online courses (MOOC) [4]. In addition, the methods of accessing high-quality online education have been explained. Such seminars indicate that the promotion of OER is present even at the institutional level, and in accordance with the current legal regulations. Further, a lecture entitled *Digitization and the Knowledge Society* on the subject of free licences, Wikimedia projects, and all aspects of intelectual property in academic papers and projects, has been held at the Mathematical Institute of the Serbian Academy of Sciences and Arts (SASA). Popularization of development, implementation and use of OER in Serbia requires the organization of similar activities at the national and institutional level. Such seminars allow for the improvement of the culture of education, referring to the OER as a new value that should be included in the concept of open education, with the initial goal to build trust in OER [5].

Starting from the basic work requirements for OER, that is the availability of information and communications technology, the Strategy for the Development of Information Society [3] directs towards the maximum utilization of the potential of ICT so as to improve the quality of life. Among others, the Strategy [3] assumes "open, accessible for all, and good access to the internet," which is a basic requirement for the development and use of OER.

It has been attempted to develop OER in Serbia through already defined practice in other countries, or through their own solutions.

Khan Academy [6] is an example of the non-profit educational website which was developed in 2006 to provide free education "for anyone anywhere." Serbia has started the translation of a video on mathematics, planning to translate the materials on other fields as well. About 400 videos are translated at the moment, and over 150 are synchronized. The mentioned videos are available at http://www.youtube.com/user/KhanAcademySerbian. A part of the translated videos is the product of the cooperation with the LINK group and the Faculty of Philology in Belgrade, while the rest is the result of the work of volunteers and interested individuals. In addition to the translation of educational content, Khan Academy in Serbia is translating the Khan platforms and interactive exercises. The platform is almost fully translated and it is available at http://translate.khanacademy.org. The current work refers to the planning of the translation of exercises. Further, an initiative for mapping of mathematical content in the curricula of individual countries is a significant step for the use of the materials in formal education.

The Belgrade university library *Svetozar Markovic* launched a project on the translation of courses and free learning materials into Serbian [7]. This is also an example of the contribution to the expansion of the existing MOOC practice and the existing platforms for the development and sharing of OER. Further, this example illustrates institutional efforts and the initiative for the development of OER in accordance with the existing legislation.

Apart from the existing solutions within the Khan Academy and the MOOC, their own environment for setting and sharing learning materials has been created . In 2007, within the creative commons project [8] the creative commons national standards were accepted and some examples of good practice in Serbia were given.

In 2005, Wikimedia Serbia was founded with the aim to allow free exchange of knowledge and participation in gathering educational contents [9]. This is a non-profit, independent organization that supports free knowledge and related projects. Wikimedia Serbia is a civic association that is currently implementing several projects. This association has been working on the implementation of Creative Commons licenses in the legal system of Serbia, according to the rules of the international Creative Commons procedure. These licenses are in accordance with national laws and language, and they are also internationally recognized. Wikimedia Serbia is also working on the promotion of Creative Commons licenses with the support of the *Creativity and knowledge-based society* project in which, among others, the discussion on intellectual property and

open forms of intellectual interaction in digital conditions has been opened. Apart from the above mentioned project, Wikimedia Serbia cooperates with various organizations in the organization of seminars and activities that lead to the popularization and education.

Apart from Wikimedia, New Media Center_kuda.org [10], an independent organization that brings together artists, media activists, researchers, and others in the field of information technology also operates in Serbia. This organization deals with the information potential and its influence on the political, economic and cultural relations in the society.

Further, the newly founded Balkan Distance Education Network (BADEN) [11] was created with the aim of hosting resources and information related to open,distance and e-learning. The development plan of this platform also provides the basis for sharing OER.

4. WEAKNESSES, DEFICIENCIES, AND AMBIGUITIES REGARDING THE OER IMPLEMENTATION

Even though e-learning and digitization of learning contents are clearly increasing, there are still significant weaknesses in the implementation and development of OER in the Western Balkans. Weaknesses, deficiencies and ambiguities that arise in the process of the implementation of OER should be anticipated by the OER implementation plan, which is a necessary prerequisite for effective and efficient implementation of OER. The implementation plan includes the following:

• The identification of activities, barriers and potential proposals for their overcoming;
• A detailed description of all activities;
• Allocation of responsibilities and setting time frames.

Along with a defined plan and specific activities, not only have potential problems been identified, but also a way to overcome them. As opposed to the difficulties in the OER implementation, there also exist benefits. This section highlights the difficulties in the OER implementation in the Western Balkans, and the SWOT analysis systematizes the following:

• Strengths, or the features of the implementation that provide advantages and benefits with regard to the other ones;
• Weaknesses, or the features that make the process of implementation more difficult, and that are typical for the Western Balkans;
• Opportunities, or the features that are related to the possibilities that lead to advantages;
• Threats, or the features of the environment that may lead to the problems in the process of implementation.

The following SWOT analysis determines strengths, weaknesses, opportunities and threats through various levels of significance. Table 1 shows abbreviations and the meaning of the SWOT analysis elements, and possible significance quantification [12] that is used in this paper.

Table 1: SWOT analysis and significance quantification[12]

SWOT	Significance quantification
S-Strenghts	Highly significance →+++
W-Weaknesses	Medium significance → ++
O-Opportunities	Low significance → +
T-Threats	No significance → 0

S-Strengths:
• The availability of information about OER implementation, experience and current strategies related to OER; ++
• The decision-making and OER implementation processes involve not only teachers, but also other staff and interested individuals; +
• A large number of educational institutions possess computer equipment and internet connection; +++
• Computer science is a compulsory subject in the curricula for primary and secondary education; ++
• The existence of special programs that are focused on the acquisition of specific ICT skills; +
• Academic institutions are willing to further the implementation of OER through formal and informal education; +
• Low cost of OER production and publishing (the use of free Internet tools and services for creation, storage and disclosure) with high and permanent generated value (once created, the resource has virtually unlimited lifespan); +++
• The existence of strategic development plans and an action plan; ++
• Respectable professional potential of former students at home and abroad; ++
• Intensive cooperation with the international academic community; ++
• The quality of human resources; +++
• The developed system that guarantees quality at all public universities; ++
• The existence of the necessary critical mass of teachers and their associates who are ready for reforms; +
• The awareness of their own responsibility for development. ++

W-Weaknesses:
• A lack of professional internal control in the field of OER implementation and sharing resources; ++
• Unclear job description and individuals' responsibilities for the OER implementation control; ++
• The insufficiently developed system of feedback from the OER users; +++
• The insufficient system of the professional development in the field of OER implementation; +
• OER uses a small number of subjects with insufficient technical equipment; ++
• Insufficient IT contents on the OS platform; +++
• A lack of targeted training for the OER implementation; ++
• Didactic software is not provided in the teaching process; +++

• A lack of defined procurement plans and licensing for the selection and application of didactic software; +++
• A lack of staff and informal training for skill development; ++
• The teaching process mostly focuses on the transfer of information and the "acquisition" of knowledge; +
• A lack of a stable source of research funding; +++
• The insufficient involvement of students in research; ++
• A relatively poor motivation of university staff; +++
• Low investment in the teachers and staff training to use new technologies and techniques; ++
• A lack of quality administrative staff for the support of the international cooperation activities; +++
• Inadequate monitoring of the implementation of laws and policies; +++
• Inadequate infrastructure in the field of ICT; +++
• Insufficient training abroad; ++
• The insufficient number of mutual research projects with the economy; ++
• Inadequate cooperation with the economy; ++
• A large percentage of "brain-drain". +++

O-Opportunities:
• The cooperation with European universities and institutions that successfully implement OER; +++
• The improvement of the professional competence of non-teaching staff in the field of OER; +
• The international IT projects have special significance for the promotion of OER ++
• The affirmation of OER and ideas is realized through academic cooperation +
• Public awareness of the necessity of joining the European academic circles; ++
• The opportunity for active participation in various European projects; +++
• Constant increase in the economic need for lifelong professional development; +
• Linking different scientific fields and initiating interdisciplinary projects; +
• Regular monitoring and support for quality improvement, by raising awareness of quality; ++
• The opportunity that is provided by the technology transfer with the aim of faster knowledge acquisition; ++
• The opportunity for the involvement of our experts from abroad. +

T-Threats:
• A lack of OER related strategy; +++
• The OER implementation process is based on enthusiasm and motivation of individuals or groups, instead of an organized structure that should continuously control the quality of the implementation and development of OER; +++
• A lack of sources of funding for professional development of those who are interested in training in the field of OER implementation; ++
•Economic instability; +
• Insufficient broadband internet access; +++
• A lack of awareness of and resistance to changes in the implementation of new solutions; +
• A lack of awareness of the importance of OER; +++
• Incomplete legislation and poor implementation of the existing one; +++
• Limited employment opportunities for scientific staff; +
• Constant "brain drain"; ++
• Uncontrolled development of higher education institutions in some areas of Bosnia and Herzegovina at the expense of quality; +
• Poor feedback between the economy and universities; ++
• A lack of lifelong learning culture. +++

5. METHODS FOR IMPROVEMENT OF THE OFFERING AND IMPLEMENTATION OF OER

Apart from the above mentioned categories which show weaknesses, difficulties and ambiguities, this chapter suggests potential solutions for overcoming barriers. Here follows a suggestion of corrective measures and actions for the quality improvement:

• Everyone who is employed in the institutions that implement OER in accordance with its business functions should be included in a stage of OER implementation or quality control, while sharing resources and constantly collaborating;
• Develop a methodology for OER implementation evaluation;
• Consistently monitor the anticipated procedures and quality assurance measures;
• Evaluate the effectiveness of the implementation of procedures and quality assurance measures;
• Organize training in the field of OER implementation quality assurance;
• Develop institutional strategies for OER implementation;
• Continuous promotion of the former and current work on the development and use of OER;
• Analyze the institutions' needs in the field of OER within the future activities;
• Allow the comparative analysis in the field of the development and use of OER, by constant exchanges of the staff who work on the development and use of OER at home and abroad;
• Systematically promote the advantages and opportunities of OER;
• Improve collaboration between individuals and institutions that are involved in the development and use of OER;
• The action plan should define a platform that integrates OER solutions, or provides a type of online courses and learning materials;
• The foundation of Open Source Academy at certain universities and ICT centers may lead to the educational and research networks becoming members of international organizations and monitoring standards of Open Source;
• Create an environment for the inclusion of the companies that design didactic software, considerable portion of which should be on the OS platform;
• The action plan should include the creation of a portal for the needs of the distribution of OS software and

exchange of experience in this field for pupils, students and teachers, and a didactic portal for the needs of universities;
• The portal should create a forum where users can post questions, express their opinion on the software and exchange experiences in the use of a specific didactic software.

6. CONCLUSION

The application of OER allows the implementation of technologies that radically improve the process of education and it contributes to the improvement of scientific cooperation. Societies in the process of transition and development of new economies that are based upon knowledge are particularly important for the development of these technologies. The tendency of the Western Balkan countries to direct economic development towards knowledge and innovations in the process of the EU accession requires the use of new technologies and strengthening of the institutional mechanisms for the OER development.

Not only is it necessary to improve legislation for the implementation and development of OER, but the organized awareness of the importance of, necessity for and opportunities of OER should also be built, by linking the educational with the economic systems.

In order to strengthen innovation and encourage the development, the process of education should be directed towards the researches for which OER is an important platform. Young researchers should be particularly encouraged to introduce innovations in knowledge by the use of various forms of education that are based upon web technologies.

The development and improvement of knowledge require greater investment in education and professional development and the encouragement of the implementation of innovative technologies. A special effort should be made so that the expert resources within the academic community could be integrated, thus becoming a core for further expansion and use of OER.

Participation in international projects makes the European achievements familiar, thus raising the possibility for the affirmation and implementation of European values and harmonization of laws and practice.

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