

# Equipment Level of Technical Education/Culture Classrooms in Accordance With Pedagogical Standards for Primary Education and Norms of School Space in The Federation of Bosnia and Herzegovina

Safet Velić, Sejfo Papić, Zulfo Ahmetović

**Abstract** — Full standardization that is adequate to the goal and function of teaching technical contents in primary schools still hasn't been done in the educational system of Bosnia & Herzegovina.

An equipped classroom in accordance with the pedagogical standards for primary education and norms of school space in schools of the Federation of Bosnia and Herzegovina, and which is the case in all of Bosnia and Herzegovina, doesn't come even close to the accepted standards and norms. Classrooms, in which a systematic, non-experimental observation of the degree of readiness to hold a class in has been held, have shown a disturbing lack of tools and equipment needed to hold a successful lecture.

For a more detailed and all-encompassing work in the field, several changes have to be made: material-technical basis of work (equip schools with teaching aids, materials, adequate tools and machines for specialized work), teaching plans and programs (reduce the comprehensive curricula, and adjust it to the age of the pupils), didactic-methodic basis of work, and the stands in most important factors in educational work (students and teachers). Curriculum and syllabi for this subject need adjusting with the psycho-physical age of the learner and in that way allow them to follow trends in technology, and in return they'd be more included in the process of realization of the subject.

It is necessary to modernize the class, focus the teaching onto the learner, and secure constant learning opportunities to the teachers through seminars and education on various techniques and technologies that can be applied in teaching. Keeping in touch with the times we live in, following the latest technological advancements and applying them in the teaching process is the path that education has to follow.

**Index Terms:** norms, pedagogical standards, systematic non-experimental observation. standardization, Technical education

## I. INTRODUCTION

The main function of the educational standards is to provide

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school with the framework and guidelines for implementation of the mandatory educational goals. These standards can be used as an instruction for teachers, students and parents, which aim to develop school systems and improve teaching process continuously. (Najdanović Tomić, et.al.,2012).

Educational standards are statements about fundamental knowledge and teachings which students have to gain to a certain level of education. Most often they determine the minimal level of competences which are expected of all students at the certain level of achievements ( OECD, 2005). Standards are based on the goals of education that are incorporated in national plan and programme for the certain school subject. Their role is to express general statements of goals to concrete ones, which can be checked by tests. ( NRC, 1996; BMBF, 2003).

By a standard which is based on a competency model that was derived from the character of the technical education, the minimal knowledge of a student is determined, the database for testing is developed and the clear way of implementation of a subject program in practice is provided.

## II. DIDACTIC - METHODOLOGICAL VALUE OF PRESCRIBED STANDARDS AND THEIR ADEQUACY OF EDUCATION SYSTEM OF BOSNIA AND HERZEGOVINA

Prescribed standards were not met completely, from the point of view of didactic- methodical base flow of the teaching process. In order to achieve a higher level, it is needed to do some further work on:

- knowing and implementing pedagogical theory and practice;
- managing in the field;
- teaching and monitoring skills;
- adopting school procedure;
- creating teaching contents
  - planning, programming,
  - preparing for the teaching process,
- recognizing and solving educational problems;
- developing class managing skills;
- finding answers for discipline problems;

- teaching in limited school opportunities;
- motivation of students and their involving in class activities;
- evaluation skill;
- understanding social and the other circumstances which can have an impact on student expression and behavior;
- learning communication with parents and involving parents;
- connecting theory and teaching methods acquired by education in teaching process (Petriņšak, 2009).

According to Teaching plan and programme for a nine-year primary school in Sarajevo Canton, the lessons in this subject are done using practical exercises and lectures. For the successful realization of the lectures in a preparation phase for practical work, it is needed to ensure technical documentation, tools, machines and materials, and means for hygienic-technical protection. Lessons of technical education are held in a classroom, school workshop or at the test site, which is specially prepared for this purpose (only special parts of the programme).

The further directions of the development are referred to transformation of classrooms for technical education and IT. Realization of sophisticated contents by applying modern teaching methods is impossible without a functional and transformed classroom. A flexible classroom – workshop enables organizing a space for the specific type of activities (Golubović, 2012).

A technical education classroom has to be provided with all of the needed tools, equipment, machines and materials that are needed for realization of the lessons.

If we want to give a chance to all students to do practical work, it is needed to divide the classes into groups of maximum 16 students. Each group has planned number of hours, and the lessons are held in double classes (two classes for each group). In this way students can experience the whole process, to make plans, to do projects and make objects in practice. During the lectures, it is needed to have a correlation with the other school subjects (maths, art, Culture of Life, chemistry, physics, biology, ...).

Students use course books, logs, drawings and the other sources of knowledge during the lessons. Students keep a journal (as technical documentation), which is, by regulations, kept at school. But students can take it home, sometimes, for their parents to take a look.

### III. EDUCATIONAL STANDARDS

In order to ensure appropriate pedagogical and material conditions in all primary schools in Sarajevo Canton, in accordance with the Law on Primary Education (“Official Gazette of Sarajevo Canton”, No. 10, 22.04.2004.), Pedagogical standards and general norms for the primary education and Norms of working space, equipment and teaching aids for school subjects in primary school, as a common basis to ensure the fundamental conditions for educational work and successful realization of aims and goals

of primary school, educational institutions, centers, institutes are put in place. (Pedagogical standards and general norms for primary education and norms of working space, equipment and teaching aids for school subjects in primary school, 2007).

The Standards ensure that all students and teachers have the same starting basis to develop the skills of the students, which along the other relevant acts serves as a basis for the approximation of the economic price of the educational work. During the makings of the Standard, the accents are put on the elements of scientific discovery, the needs of the students, and social orientation, in which primary education acts as a foundation of the whole educational system. With the reform of the whole educational system and the intention of bringing together and harmonization with European and world’s educational flows, leads to the routing of the activities on the way to accreditation and validation of our diploma in Europe and the rest of the world. The intention is to modernize and stimulate the educational process as a whole, and satisfy the requirements of the educational plans and programs of individual subjects. Conditions and applications are introduced to realize all types of class, which modern pedagogical science and practice require. The change is observed in individualized classes with fewer students per classroom, work with gifted students, children with developmental disabilities, in cultural and social work, as in greater collaboration of teachers and students.

The development of educational standards (Klieme, 2007.) includes setting up sociological and pedagogical goals, scientific approach in the fields of didactics and psychology, with the goal determining the structure competences and developing methods and concepts of testing.

Klieme says that educational goals represent relatively common statements about knowledge and skills, but also about attitudes, values, interests and motivation of students which schools should accomplish. These goals are being turned into specific requests by standards. To turn these requests into practice, a medium is required, so we can define and determine them. Traditionally that was curricula, which is changing now by competency models. According to Mareli, aspects, levels and the way of their development are described by the models of competency. They originated from competency requests which students have to poses to achieve the main learning tasks.

Formulation of educational standards must be understandable for parents and students. Standards don’t cover the whole curricula, but they are applied on the crucial fields of learning. Teachers give marks independently, as a part of their pedagogical responsibility, according to professional criteria, taking in account wide spectra of factors. Application of knowledge tests based on exclusively on standards has to be clearly separated from grading, their main purpose is evaluation.

In contrast to curricula, standards give a clear focus of the teachers’ work. By the criteria of minimum competence, the teachers have an easier time determining which students need more help and support. Using knowledge test based on standards with the aim of monitoring and evaluation what is

already learned, the teachers are given a chance to compare their diagnostic conclusions with the results. The idea is to allow them the feedback about the quality of their work. The educational standards have far reaching consequence on the school system.

#### IV. NUMBER OF LESSONS IN FIELD OF EDUCATION IN TECHNIQUE AND INFORMATION TECHNOLOGY IN THE CURRICULA OF BOSNIA AND HERZEGOVINA

According to the curriculum in Croatian for the nine-grade elementary schools in Bosnia and Herzegovina, which has been used from the beginning of the 2009/2010 school year in Posavski Canton, Hercegovackoneretvanski Canton, Central Bosnia Canton and Hercegovosna Canton, as well as schools in other Cantons that work according to the curriculum in Croatian, the subject Technical Culture is taught (will be taught) as a compulsory subject from the 6th to the 9th grade, and Computer Science as an elective subject from the 6th to the 9th grade with two lessons per a week, that is as an extra – curriculum activity from the 2nd to the 4th grade with a lesson per a week.

On the basis of the Decision of Minister of Ministry for education, science, culture and sport of Central Bosna Canton no : 01-38-799/2012 od 22.06.2012 from 22.06.2012, the curriculum for the 1st – the 4th grade of the nine-grade elementary school that is carried out in Bosnian was approved. Having in mind that the same curriculum has been applied since 2012/2013 in the said Canton and the teaching Technical Culture/Education and Computer Science is still conducted according to the old curriculum for the eight-grade elementary school ([www.skolegijum.ba](http://www.skolegijum.ba); [www.mozks-ksb.ba](http://www.mozks-ksb.ba); [www.rpz-rs.org](http://www.rpz-rs.org); [www.monkstk.ba](http://www.monkstk.ba); [www.pzusk.ba](http://www.pzusk.ba)).

The subject matter of technique is also given through elective subjects.

#### V. GENERAL NORMS FOR WORKING AREA, EQUIPMENT, TEACHING MATERIALS AND AIDS FOR THE SUBJECT TECHNICAL CULTURE

The table of norms define: working area-specialised classrooms, pre-classrooms and pantries, equipment , teaching material, aids and school furniture. On the basis of the parallel drawn between the prescribed norms for equipment and teaching materials and aids in the schools in Federation of Bosnia and Herzegovina, the Republic of Srpska and the schools working according to the curriculum in the Croatian language, it can be concluded that the general norms for working area, equipment, teaching materials and aids for the subject Technical culture/Technical Education are almost identical and differ only on several following elements:

- General norms for working area, equipment, teaching

material and aids of the Republic of Srpska don't include 25 types of furniture that is prescribed in the general norms for schools in Federation of Bosnia and Herzegovina.

- When it comes to the prescribed machines and apparatuses, the general norms in the Republic of Srpska don't include (isn't listed) a motorbike, unlike the general norms in the Federation of B&H.
- In the schools that work according to the curriculum in the Croatian language, among the necessary machines and appliances, there are no universal woodworking machines with a pedestal, unlike the schools in Federation of Bosnia and Herzegovina and the schools in the Republic of Srpska
- In the schools in Federation of Bosnia and Herzegovina a set of 60 boxes, and 32 boxes in the Republic of Srpska is prescribed for realization of the curriculum contents in the field of mechanical engineering, electrical engineering, electronics and civil engineering.

On the basis of the protocol of systematically unexperimental observation of degree of equipment of the educational institutions (schools) with necessary materials and technical resources conducted in 16 elementary schools in Sarajevo Canton, the following data has been collected that are given in Graph 1. and Table II.

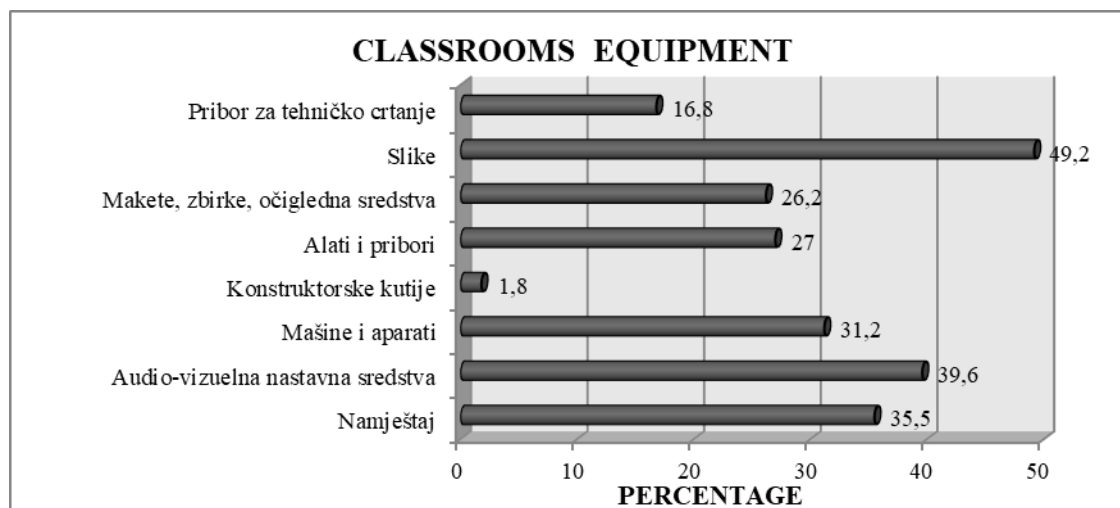
#### VI. CONCLUSION

Table II and Chart 1 show that the level of equipment in the cabinet of technical education/ culture is not in accordance with pedagogical standards for primary education nor with standards of school space in the Federation of Bosnia and Herzegovina, such as it's in the rest of territory of Bosnia and Herzegovina. Systematic non-experimental observation level of the equipment cabinet with the necessary material and technical means was done in cabinets which are equipped with a minimum prescribed means and equipment.

Therefore, the teaching process of technical education/culture does not take place in adequate material nor technical conditions and it depends on the material and technical equipment of the school.

#### NOTE:

The table II. has two part, include label „(a)“ and label „(b)“



Graph 1. Degree of equipment of Technical Culture/Technical Education classrooms in accordance with the pedagogical standards for elementary education and norms for school space.

Table I. Number of lessons in the field of education in technique and information technology

ENTITY / CANTON	SUBJECT	GRADE									Σ
		I	II	III	IV	V	VI	VII	VIII	IX	
		NUMBER OF LESSONS									
<b>FEDERATION OF BOSNIA AND HERZEGOVINA</b>											
UNA-SANA CANTON	TECHNICAL CULTURE	*	*	*	*	*	1	1	1	1	4
	COMPUTER SCIENCE	*	*	*	*	*	1	1	1	1	4
	THE BASICS OF TECHNIQUE AND COMPUTER SCIENCE	*	*	*	*	1	*	*	*	*	1
POSAVINA CANTON*	TECHNICAL CULTURE	*	*	*	*	*	1	1	1	1	4
	COMPUTER SCIENCE *	*	*	*	*	*	2	2	2	2	8
	COMPUTER SCIENCE **	*	1	1	1	1	*	*	*	*	4
TUZLA CANTON	TECHNICAL CULTURE	*	*	*	*	*	1	1	2	1	5
	COMPUTER SCIENCE	*	*	*	*	*	1	1	1	1	4
	THE BASICS OF TECHNIQUE AND COMPUTER SCIENCE	*	*	*	*	1	*	*	*	*	1
ZENICA-DOBOJ CANTON	TECHNICAL CULTURE	*	*	*	*	*	1	1	1	1	4
	COMPUTER SCIENCE	*	*	*	*	*	2	2	*	*	4
	THE BASICS OF TECHNIQUE	*	*	*	*	1	*	*	*	*	1
BOSNIAN-PODRINJE CANTON	TECHNICAL CULTURE	*	*	*	*	*	1	1	2	1	5
	COMPUTER SCIENCE	*	*	*	*	*	1	1	1	1	4
	THE BASICS OF TECHNICAL EDUCATION	*	*	*	*	1	*	*	*	*	1
CENTRAL BOSNIA CANTON	TECHNICAL CULTURE	*	*	*	*	*	1	1	1	*	3
	COMPUTER SCIENCE	*	*	*	*	*	*	1	1	*	2
CENTRAL BOSNIA CANTON*	TECHNICAL CULTURE	*	*	*	*	*	1	1	1	1	4
	COMPUTER SCIENCE *	*	*	*	*	*	2	2	2	2	8
	COMPUTER SCIENCE **	*	1	1	1	1	*	*	*	*	4
HERZEGOVINA-NERETVA CANTON	TECHNICAL CULTURE	*	*	*	*	*	1	1	1	*	3
	COMPUTER SCIENCE	*	*	*	*	*	*	1	1	*	2
HERZEGOVINA-NERETVA CANTON *	TECHNICAL CULTURE	*	*	*	*	*	1	1	1	1	4
	COMPUTER SCIENCE *	*	*	*	*	*	2	2	2	2	8
	COMPUTER SCIENCE **	*	1	1	1	1	*	*	*	*	4
WEST HERZEGOVINA	TECHNICAL CULTURE	*	*	*	*	*	1	1	1	1	4

CANTON	COMPUTER SCIENCE *	*	*	*	*	*	1	1	1	1	4
	COMPUTER SCIENCE **	*	*	*	*	*	2	2	2	2	8
SARAJEVO CANTON	TECHNICAL CULTURE	*	*	*	*	*	1	1	2	1	5
	COMPUTER SCIENCE	*	*	*	*	*	1	1	1	1	4
	THE BASICS OF TECHNIQUE	*	*	*	*	1	*	*	*	*	1
WEST BOSNIA CANTON	TECHNICAL CULTURE	*	*	*	*	*	1	1	1	1	4
	COMPUTER SCIENCE *	*	*	*	*	*	2	2	2	2	8
	COMPUTER SCIENCE **	*	1	1	1	1	*	*	*	*	4
<b>REPUBLIC OF SRPSKA</b>											
	TECHNICAL EDUCATION	*	*	*	*	*	1	1	1	1	4
	THE BASICS OF COMPUTER SCIENCE	*	*	*	*	*	1	1	1	1	4

Table II. „(a)“ Stage equipment of technical education / culture cabinet in accordance with pedagogical standards for primary education, standard and school space in schools in the Federation of Bosnia and Herzegovina

SCHOOL NAME PUBLIC PRIMARY SCHOOL	FURNITURE			AUDIO-VISUAL TEACHING AIDS			MACHINES AND APPARATUS			CONSTRUCTORS BOXES			TOOLS AND ACCESSORIES		
	The norm	The school has	%	The norm	The school has	%	The norm	The school has	%	The norm	The school has	%	The norm	The school has	%
„PODLUGOVI“	81	22	27,2	3	2	66,7	23	3	13,0	60	0	0	1313	260	19,8
„BEHAUDIN SELMANOVIĆ“	81	22	27,2	3	1	33,3	23	12	52,2	60	0	0	1313	439	33,4
„VELEŠIČKI HEROJI“	81	42	51,8	3	2	66,7	23	6	26,1	60	0	0	1313	313	23,8
„DOBROŠEVIĆI“	81	20	24,7	3	1	33,3	23	11	47,8	60	0	0	1313	239	18,2
„MEHMEDALIJA MAK DIZDAR“	81	30	37,0	3	1	33,3	23	6	26,1	60	2	3,3	1313	97	7,4
„GRBAVICA 1“	81	26	32,1	3	2	66,7	23	8	34,8	60	0	0	1313	236	18,0
„SAFET BEG BAŠAGIĆ“	81	30	37,0	3	1	33,3	23	7	30,4	60	0	0	1313	371	28,3
„SOKOLJE“	81	50	61,7	3	0	0	23	2	8,7	60	4	6,7	1313	282	21,5
„HASAN KAIMIJA“	81	22	27,2	3	0	0	23	5	21,7	60	0	0	1313	171	13,0
„PORODICE EF.RAMIĆ“	81	25	30,9	3	2	66,7	23	7	30,4	60	3	5,0	1313	265	20,2
„OLOVO“	81	28	34,6	3	1	33,3	23	7	30,4	60	0	6,7	1313	436	33,2
„BRČANSKA MALTA“	81	14	17,3	3	2	66,7	23	7	30,4	60	0	0	1313	505	38,5
„FAHRUDIN FAHRO BAŠČELIJA“	81	7	8,6	3	0	0	23	3	13,0	60	0	0	1313	142	10,8
„ČETVRTA OSNOVNA ŠKOLA“	81	44	54,3	3	3	100	23	16	69,6	60	5	8,3	1313	1248	95,0
„ALEKSA ŠANTIĆ“	81	56	69,1	3	0	0	23	9	39,1	60	4	6,7	1313	480	36,6
„DŽEMALUDIN ČAUŠEVIĆ“	81	22	27,2	3	1	33,3	23	6	26,1	60	0	0	1313	197	15,0
TOTAL	1296	460	35,5	48	19	39,6	368	115	31,2	960	18	1,8	21008	5681	27,0

Table II. „(b)“ Stage equipment of technical education / culture cabinet in accordance with pedagogical standards for primary education, standard and school space in schools in the Federation of Bosnia and Herzegovina

SCHOOL NAME PUBLIC PRIMARY SCHOOL	MODELS, COLLECTIONS, VISUAL AIDS			PICTURES			ACCESSORIES FOR TECHNICAL DRAWING			TOTAL		
	The norm	The school has	%	The norm	The school has	%	The norm	The school has	%	The norm	The school has	%
„PODLUGOVI“	15	1	6,7	4	1	25	36	1	2,8	1535	290	18,9
„BEHAUDIN SELMANOVIĆ“	15	1	6,7	4	1	25	36	17	47,2	1535	493	32,1

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„VELEŠIĆKI HEROJI“	15	9	60	4	3	75	36	1	2,8	1535	376	24,5
„DOBROŠEVIĆI“	15	0	0	4	0	0	36	0	0	1535	271	17,6
„MEHMEDALIJA MAK DIZDAR“	15	0	0	4	1	25	36	0	0	1535	136	8,7
„GRBAVICA I“	15	3	20	4	4	100	36	1	2,8	1535	280	18,2
„SAFET BEG BAŠAGIĆ“	15	2	13,3	4	2	50	36	32	88,9	1535	445	29,0
„SOKOLJE“	15	4	26,7	4	1	25	36	5	13,9	1535	348	22,7
„HASAN KAIMIJA“	15	0	0	4	1	25	36	1	2,8	1535	200	13,0
„PORODICE EF.RAMIĆ“	15	12	80,0	4	4	100	36	2	5,6	1535	320	20,8
„OLOVO“	15	7	46,7	4	2	50	36	2	5,6	1535	483	31,5
„BRČANSKA MALTA“	15	9	60,0	4	3	75	36	2	5,6	1535	542	35,3
„FAHRUDIN FAHRO BAŠČELIJA“	15	0	0	4	1	25	36	0	0	1535	153	10,0
„ČETVRTA OSNOVNA ŠKOLA“	15	12	80,0	4	4	100	36	30	83,3	1535	1362	88,7
„ALEKSA ŠANTIĆ“	15	3	20,0	4	1	25	36	2	5,6	1535	555	36,2
„DŽEMALUDIN ČAUŠEVIĆ“	15	0	0	4	2	50	36	1	2,8	1535	229	14,9
<b>TOTAL</b>	<b>240</b>	<b>63</b>	<b>26,2</b>	<b>64</b>	<b>31</b>	<b>49,2</b>	<b>576</b>	<b>97</b>	<b>16,8</b>	<b>24560</b>	<b>6483</b>	<b>26,4</b>

### REFERENCES

- [1] Najdanović-Tomić, J., et al., Standardi za tehničko i informatičko obrazovanje, Zbornik radova Tehnika i informatika u obrazovanju, Tehnički fakultet, Čačak,
- [2] Petrinšak, S., et al., Kompetencije učenja i ishodi učenja, Stručni skup iz informatike za voditelje županijskih stručnih vijeća, mentore i savjetnike, Vukovar, 2009.
- [3] Golubović, D, *Tehnika i informatika u obrazovanju*, Zbornik radova Tehnika i informatika
- [4] Kliem, E. et al., Zur Entwicklung nationaler Bildungsstandards, Bundesministerium für

*Nastavni plan i program za šesti, sedmi, osmi i deveti razred devetogodišnje osnovne škole*, Ministarstvo za obrazovanje nauku i mlade Kantona Sarajevo, Sarajevo 2010.

NRC, the National Science Education Standards, The National Academies Press, Washington, in 1996.

OECD Definition and Selection of Key Competencies: Executive Summary, OECD, 2005th

*Okvirni nastavni plan i program za devetogodišnju osnovnu školu u Federaciji BiH*, Federalno ministarstvo obrazovanja i nauke, 2009.

*Zakon o osnovnom odgoju i obrazovanju*, „Službene novine Kantona Sarajevo, br. 10 od 22. 04. 2004., Sarajevo, 2004.

*Zbornik radova Tehnika i informatika u obrazovanju*, Tehnički fakultet, Čačak, 2012.

[www.monkstk.ba](http://www.monkstk.ba)

[www.mozks-ksb.ba](http://www.mozks-ksb.ba)

[www.mzos.rh](http://www.mzos.rh), Nacionalni okvirni kurikulum <http://public.mzos.hr>.

[www.rpz-rs.org](http://www.rpz-rs.org)

[www.rs.cest.gov.ba/index.php/.../13251mrakovica...obuka...i.../file](http://www.rs.cest.gov.ba/index.php/.../13251mrakovica...obuka...i.../file)

[www.skolegijum.ba](http://www.skolegijum.ba)

### OTHER SOURCES

*Nacionalni okvirni kurikulum za predškolski odgoj i obrazovanje te opće obvezno i srednjoškolsko obrazovanje*, Republika Hrvatska, Ministarstvo znanosti, obrazovanja i športa, Zagreb, 2010.

*Nastavni plan i program*, „Službeni glasnik Republike Srpske“, broj: 07.020/602-3901-1/09 od 9. decembra 2009. godine, Banja Luka 2009.

*Nastavni plan i program na hrvatskome jeziku za devetogodišnje osnovne škole u Bosni i Hercegovini*, Livno, 2009.