

Sabahudin Jašarević¹⁾
Samir Lemeš¹⁾

¹⁾ University of Zenica, sjasarevic@mf.unze.ba, slemes@mf.unze.ba

QMS IN HIGHER EDUCATION STUDY PROGRAMS IN BOSNIA AND HERZEGOVINA

Abstract:

This paper describes the presence of courses related to Quality Management Systems (QMS) in the curricula at the universities and colleges in Bosnia and Herzegovina. This analysis covered only public higher-education institutions, since private universities in Bosnia and Herzegovina rarely have publicly available curricula. Results showed that QMS-related courses are rather uniform, and are regularly found at technical faculties (mainly mechanical engineering) and at faculties for economics.

Keywords: *Quality Management System, Higher Education, Curricula*

1. INTRODUCTION

Bosnia and Herzegovina is administratively divided into two entities: Federation of Bosnia and Herzegovina (FBiH) and Republika Srpska (RS); the third administrative unit is District Brčko. FBiH consists of 10 cantons. There are 12 ministries of education: 10 in cantons, 1 in RS and 1 in District Brčko. Federal Ministry of Education and Science has only a coordinating role on certain issues. All rights, obligations and other legal issues in FBiH are at the cantonal level.

The Framework Law on Higher Education at the state-level was used as a legal basis for the establishment of two state-level bodies: the Agency for Development of Higher Education and Quality Assurance and the Center for Information and Recognition of Qualifications in Higher Education.

The Ministry of Civil Affairs has been assigned the role of coordinating the work of lower level ministries, canton, entities and Brčko District, and it also regulated the work of B&H Rectors' Conference. Such a complex political and administrative situation makes the system of higher education very complex and diverse.

2. STATUS OF HIGHER EDUCATION IN BOSNIA AND HERZEGOVINA

In July 2014, there are 8 public (state-owned) universities and 35 private universities and colleges in Bosnia and Herzegovina, whose integration process is not completed. There are two public universities in the Republika Srpska, under jurisdiction of the Ministry of Education of the Republika Srpska. There are six public universities in the Federation of Bosnia and Herzegovina, under jurisdiction of their founders - Cantons. Higher education in the Federation of Bosnia and Herzegovina, as well as the secondary and primary education, is regulated by cantons which basically means that each canton may establish its own public university.

Tables 1 and 2 present the list of public and private universities and colleges operating in Bosnia and Herzegovina. The list of licensed higher education institutions was created by the Agency

for Development of Higher Education and Quality Assurance in Bosnia and Herzegovina, based on the information of the educational authorities which issued the licenses/permissions to work for the institutions stated in the list.

Table 1. Public Higher Education Institutions in B&H [1, 2]

Higher Education Institution	Founder	Number of colleges or study programs
University of Banja Luka	Republika Srpska	16
Medical College Prijedor		4 SP
University of East Sarajevo		15
University of Bihać	Una-Sana Canton	7
University of Sarajevo	Sarajevo Canton	24
University of Tuzla	Tuzla Canton	13
University of Zenica	Zenica Doboje Canton	8
"Džemal Bijedić" University Mostar	Herzegovina Neretva Canton	8
University of Mostar		11

Table 2. Private Higher Education Institutions in B&H [2]

Higher Education Institution	Number of colleges or study programs
University for business studies, Banja Luka	7
University for business engineering and management PIM, Banja Luka	5
Autonomous University of Banja Luka	-
Pan-European University "Apeiron", Banja Luka	7
University "Vitez" Vitez	4
University of Travnik	5
University Sarajevo School of Science and Technology	7
International University of Sarajevo	3
International Burch University	4
Slobomir P University, Bijeljina	-
American University in Bosnia and Herzegovina	4
University "Sinergija" Bijeljina	5
Banja Luka College	9 SP
High College for applied and law sciences "PROMETEJ"	3 SP
High College "PRIMUS", Gradiška	6 SP
College of Service Operations Sokolac	7 SP
University "Bijeljina" Bijeljina	5 SP
Banja Luka College of Communications Kappa Phi	3 SP
IB College industry in business Bosanska Krupa	9 SP
College of Economy and Informatics Prijedor	5 SP
College of International Law, Banjaluka	1 SP
Herzegovina University	3
International University of Travnik	6
College of International Finance and Banking	2 SP
High School "CEPS - Center for Business Studies"	11 SP
Business and Technical College	3 SP
High College "Dositej"	1 SP
College "Logos centar" of Mostar	5 SP
College of cosmetology and aesthetics	1 SP
International University of Brčko District	7
College eMPIRICA of Brčko District	2 SP
European University of the Brčko District	6
College of Tourism and Management Konjic	3 SP
University "Interlogos"	5

Bosnia and Herzegovina signed the Bologna Declaration in 2003 [3]. However, higher education reform and building institutional capacities in higher education in Bosnia and Herzegovina started by adopting the Framework Law on Higher Education in 2007, which is a fundamental reform act for higher education in B&H. This law established the Agency for Development of Higher Education and Quality Assurance in Bosnia and Herzegovina (HEA) and the Centre for Information and Recognition (CIP), which began operations in late 2008.

As organization and structure of higher education in Bosnia and Herzegovina is not clearly defined, these issues are also transferred to the area of accreditation.

The Agency for Development of Higher Education and Quality Assurance in Bosnia and Herzegovina is established at the state level, in order to implement the accreditation procedure, but the accreditation process involves ministries at different levels (at the entity level for the RS and at the cantonal level of FBiH).

The accreditation process first started in the Republika Srpska. Until July 2014, 8 higher education institutions were accredited: 2 public and 5 private in RS and 1 private university in FBiH. Another 6 universities started the accreditation procedure: 2 public and 2 private universities from FBiH, and 2 private universities from RS.

The universities and colleges are still waiting for accreditation mainly due to administrative, and sometimes even due to political problems. The official public list of accredited universities is maintained by HEA [1], and CIP maintains the list of higher education institutions which have the licence for work [2].

Another important aspect of higher education is research, which should be covered by CRIS (Current Research Information System), a national registry of researchers, research projects and their results [4]. In Bosnia and Herzegovina, the Academy of Sciences and Arts established the registry [5], but there is a problem with its update, so that the data in this system is obsolete and cannot be used for evaluating the quality of research activities. That registry covers only researchers and organizations from FBiH, while the Ministry of Science and Technology of Republika Srpska maintains the independent Current Research Information System of RS since the end of 2013 [6].

3. STUDY SUBJECTS IN THE FIELD OF QMS IN PUBLIC UNIVERSITIES IN BOSNIA AND HERZEGOVINA

There has been some progress in awareness raising in relation to the issue of quality in public universities in Bosnia and Herzegovina in the last decade. Unlike situation in 2001, when only some of the public universities and some of the colleges at these universities have established Quality Management Committees, it is a normal occurrence in all public universities in B&H today, and almost at all colleges. The universities that are integrated are leading, having established a single Quality Management Committee at the University level, with the obligation to establish the Committees at the college level. It is almost a regular practice at the University of Zenica, University of East Sarajevo, University of Tuzla and University of Bihać, and most of colleges at other public universities have established Quality Management Committees/Teams and have clearly defined the mission, vision, quality objectives, etc.

Concerning the curriculum at individual colleges, the data differ significantly. We have to emphasize that we had no access to all the curricula at all organizational units, and we will present the data that were available through websites or through direct contact and brief questionnaires with individual colleges). At first glance it is obvious that issues of quality management are primarily studied at technical colleges, primarily at the Mechanical Engineering colleges (with some exceptions), then at the technology colleges and technical colleges with

special orientations where quality is studied in the context of quality control of individual products, as well as special teaching units within some other curricula. Technical colleges are followed by the Economic colleges, which also have some of the items that treats the issue of quality in their curricula. It is very uncommon to find these topics in the area of social sciences: legal sciences, philosophy, pedagogy, and the like.

3.1. University of Banja Luka

The Department of Industrial Engineering and Management at the Mechanical Engineering Faculty is the leader in studying issues of quality at this university. The first study cycle contains the course "Quality Management", and in the second study cycle contains the course "Integrated Management Systems and Business Excellence" [7, 8].

In the first study cycle of study programme "Safety at work", elements of some standards can be recognized, such as ISO 14000 and OHSAS 18000 through curricula and courses "Occupational Safety", "Waste Management" and the like.

In the second study cycle at this college, there are two courses related to the field of quality. These are: "Integrated Management Systems and Business Excellence" and "Standardization and Industrial Regulations", within the study program "Industrial Engineering and Management", and subject "Quality Management" within the study program "Manufacturing Engineering".

As for the other colleges at the University of Banja Luka, we can point out the Faculty of Economics with two courses close to the quality: "Quality Management" and "Quality and Competitiveness", where some elements or lessons are close to this area [9]. If we try to compare these courses with "Quality Management" at Faculty of Mechanical Engineering, we could say that there is a great similarity of some 60-80% (if we consider both courses).

Faculty of Technology at the University of Banja Luka deals with some aspects of product quality through different courses, such as courses "Quality Management and the Safety of Food and Beverages" and "International Regulations on Food Quality and Safety" within study programme "Quality Control and Food Hygiene", where one can identify parts of the HACCP or ISO 22000 standard, which is precisely related to the area of food production. An elective course "Quality Management System" is taught within the study programme "Textile" which mostly resembles the course from Mechanical Engineering Faculty with some specifics.

The Faculty of Agriculture at the University of Banja Luka teaches some aspects of quality through courses: "Meat and Milk Control and Processing", "Food Quality Control" and "Food Quality and Safety", which in turn corresponds mostly to standards ISO 22000 and HACCP [10].

In other colleges (such as Faculty for Architecture and Faculty for Civil Engineering and some other technical colleges) there are some courses such as "Project Management", "Management", where the individual teaching units mention some of the elements that are close to the quality, but their coverage is not enough to be able say that they have at least 50% of the content taught at the Faculty of Mechanical Engineering in Banja Luka.

3.2. University of East Sarajevo

The Quality Management Office is established at the university level and by individual colleges. The University is strongly represented in some of the TEMPUS projects that were related to the area of quality, especially in the field of higher education.

As far as the curricula concerning quality, again the most common courses are at technical colleges and in particular at the Faculty of Mechanical Engineering, where there are courses "Quality Management" and "Integrated Quality Systems" with fairly similar contents (80-90%) as in University of Banja Luka [11].

At the Faculty of Economics in Pale there is an elective course "Quality Management Methods", taught at the bachelor level. At the Faculty of Production and Management in Trebinje there is an elective course "Design of Quality Management Systems", taught at the bachelor level.

3.3. University of Tuzla

This university, just as other public universities, have created a Quality Management Committee at the university level as well as at the level of individual organizational units, i.e. colleges [12].

As a special case we can highlight the Faculty of Economics, where there is the course "Quality Management" within the study program "Management", which has about 80% of similarity with corresponding course at the University of Banja Luka.

There are some other courses in this college with some teaching units that study quality, such as "Operations Management".

3.4. University of Mostar

At the Faculty of Mechanical Engineering and Computer Science there is a subject "Quality Control", which corresponds to the course "Quality Management" from the University of Banja Luka.

At other colleges, such as Civil Engineering Faculty, there are courses such as "Project Management" containing one or two units which can be linked to quality management, or product quality control.

3.5. University "Džemal Bijedić" Mostar

Only Mechanical Engineering Faculty at University "Džemal Bijedić" Mostar has the course "Quality Management", with almost the same content (90% similarity), while at other colleges, quality is covered only through individual teaching units through courses "Management" (at the Faculty of Economics) or "Project Management" (at the Civil Engineering Faculty) [13, 14].

At the Agricultural Faculty, there are certain study units that deal with quality control of food and beverages, where one can identify parts of standards ISO 22000 and HACCP, therefore they fall into this category.

The study programme "Safety at Work" at the Mechanical Engineering Faculty has individual courses which contain parts of standard OHSAS 18000, covering quality-related topics.

3.6. University of Bihać

At the Faculty of Engineering, there is the course "Quality Management", with very similar content as in Banja Luka [15]. This course is present in three study programs: Mechanical Engineering, Civil Engineering and Textile Engineering. At the Faculty of Economics, there are individual lesson units in the course "Management". The University has Quality Management Committees at the university level and at the level of individual organisational units.

At the Biotechnical Faculty, which holds a certificate of implemented quality management system according to ISO 9001:2008, there are certain courses that relate to the quality control of products, mainly food and beverages, or individual components for their production [16].

3.7. University of Sarajevo

As the largest public university B&H, it established the Quality Management Committees or Quality Management Offices at all colleges. The most frequent study about quality is again at the Mechanical Engineering Faculty, through courses "Development of Quality Management Systems" at the Department of Industrial Engineering and Management [17]. The same

department contains the course "Process and Quality Control" (which is also an elective course at the Department "Mechanical Manufacturing Engineering"), which includes content generally related to methods of quality management, mainly statistical methods, and as a continuation of the subject "Development of Quality Management Systems".

At the Faculty of Mechanical Engineering, Department of Energy, Process Engineering and Environmental Engineering, there are courses such as: "Environment and Nature Protection", "Waste Management", "Water Protection", "Air Protection", which contain parts of the content that can be linked to a series of standards ISO 14000.

In the second cycle at the Department of Mechanical Manufacturing Engineering, study program "Manufacturing Technology, Automation and Robotics", there is the course "Quality Management" [18], which is a compilation of the previous two cases at the Department of Industrial Engineering and Management. At the Department of Wood Technology, there is the course "Quality Management in the Timber Industry", which mainly deals with quality tools and which is focused on the timber industry. In this study program there is also the course "Control of Furniture Quality", which refers to the quality control of some products that are specific to this industry.

Another college where one can notice the presence of courses in the field of quality is definitely Faculty of Economics [19]. They hold the certificate of established quality management system according to ISO 9001:2008.

The college has developed Master studies in cooperation with the Faculty of Economics in Zagreb, Croatia: "Managing Quality in Education", "Quality Management in Health Care". In the study program "Management and Organization", the course "Quality Management" is offered as an elective course.

Certain courses ("Operations Management", "Modern Techniques in Management", "Managing Business Processes") individual teaching units cover the quality. In the second study cycle, only at the Department "Economics" one course is offered in the field of quality. The course is called "Statistical Quality Control". We believe that the content of this course does not suit the course name.

As for the other colleges of the University, we did not find courses that are directly related to quality management, but one may recognize some courses or entities at some colleges that are related to specific elements of individual standards. For example, the Faculty of Forestry has some courses with teaching units related to FSC standards, which are related to forest management, and quality of products in this area.

At the Agricultural and Veterinary Faculty, there are some elements or units that relate to the quality of products, mainly food and beverages or components used in the preparation of food and beverages. At the Faculty of Pharmacy there are courses that relate to quality of pharmaceutical products and the like. At the Civil Engineering Faculty, almost all departments contain the course "Project Management", which has some units that study quality.

The Faculty of Medicine has a very developed procedures in this area, but curricula has no courses dealing with this matter.

3.8. University of Zenica

University of Zenica and all its organizational units - colleges, have established Quality Management Committees and all of them are very active. Since the beginning, the University of Zenica paid special attention to quality and its implementation in all spheres of management and education. A high percentage of the University participation in TEMPUS projects related to the field of quality is observed, especially in the sphere of higher education. One of its members,

Faculty of Mechanical Engineering, between 2003 and 2006 was the first higher education institution in Bosnia and Herzegovina certified according to standard ISO 9001:2000.

As for the curriculum, just like other universities, the quality is especially present in all technical colleges. We must emphasize the Faculty of Mechanical Engineering, which incorporated the course "Quality Management" in their curricula since 1999 [20]. Since 1999, the postgraduate studies in the field of "Quality Management" were organized in three generations, that resulted in more than 10 Masters of Engineering Science and 1 Doctor of Sciences. We expect to complete another 3-4 doctorates in this field in the near future.

Among the other courses related to this area, we can mention the course "Integrated Quality Management Systems in Maintenance", within the second study cycle at the department "Maintenance", which has almost identical content as the course in Banja Luka. The innovated curricula planned for the following academic year, the quality topics will be represented in courses "Quality Management", "Managing Product Quality" at the department "Management of Production Technologies". The Faculty of Mechanical Engineering has Engineering Ecology Department, where some courses at the first and second study cycle can be identified in the teaching units that relate to environmental management systems.

At the Faculty for Metallurgy and Materials, departments "Metallurgy" and "Materials" have an elective study course "Quality Management" in the fourth year, which corresponds to the Banja Luka course with 60% similarity [21].

There are some courses, such as "Quality and Product Control" in Chemical Engineering Department and "Statistical Control Methods" studying individual units that can also be identified in the field of quality.

At the Polytechnic Faculty, which was established three years ago, the Department "Manufacturing Business" contains the course "Measurements and Quality" which has about 50% similarity with other similar courses at other universities [22]. The reconstruction of the curriculum for the next academic year plans to include the two new courses: "Quality Management" and "Integrated quality systems", which will be 90% identical with similar courses in Banja Luka, Bihać, Mostar and Sarajevo.

Another faculty with course "Quality Management" in their curricula is the Faculty of Economics [23]. The course content corresponds to about 80-90% to the content of the same course at other colleges. The course is offered in the department "Enterprise Management". The second cycle courses have no recognizable courses in the field of quality management and similar systems.

4. CONCLUSION

This paper describes the status of higher education in Bosnia and Herzegovina, and the presence of courses related to Quality Management Systems (QMS) in the curricula at the public universities and colleges in Bosnia and Herzegovina. The contents of all QMS-related courses is rather uniform, covering 60-80% the same topics. These courses are regularly found at technical faculties, and at faculties for economics. This is due to the fact that most quality-related professional come from technical and managerial background, and the quality-related standards were created and developed by these professionals.

Another conclusion could be that universities in Bosnia and Herzegovina currently have enough academic staff in this field in order to deliver these courses efficiently and at the highest level. It would be desirable to use this advantage in the future doctoral-level courses and research, in order to take it to a higher level, from strictly professional to the scientific level.

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