

## BENCHMARKING OF TWO PUBLIC UNIVERSITIES IN BOSNIA AND HERZEGOVINA

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### ABSTRACT

*Influenced by many factors and processes, at national and international level, the concept of higher education sector is changing all over the world. Underlining the importance of: lifelong learning, high quality assurance, creation of simulative surrounding for innovations and entrepreneurship, development of new curriculum, mobility of teaching staffs and students, as well as strengthening competitiveness, the traditional role of universities has been changed and requires continuous transformations and adjustments. This paper presents external type of benchmarking of two public universities in B&H - University of East Sarajevo and University of Zenica, based on defining key performance indicators (KPI) and making comparison analysis, aimed at mapping the needs for changes of universities performance as a whole.*

**Keywords:** benchmarking, KPI, university

### 1. INTRODUCTION

The higher education system in Bosnia and Herzegovina is facing great challenges of modern age such as market, social and economy changes. In order to accept such turbulent environment, the higher education system has to be reformed, particularly in the areas of legal framework, funding and methods of university management. On the one hand, that will ensure compatibility with systems and institutions of higher education in the European Union, as well as the possibility of competition not only at European but also at the international level. On the other hand, that will help in creating a foundation of long-term sustainability of country. But the process itself is not easy, having in mind, the complexity of the legal framework of higher education system as a reflection of the complexity of state system. In addition to the state level *Law*, the Republic of Srpska, ten cantons in the Federation of Bosnia and Herzegovina and Brcko District, have their own laws and regulations in the area of higher education. The universities, as higher education institutions, are one of the key agents in transferring knowledge, technologies and innovations. In Bosnia and Herzegovina (BIH), there are eight public universities. This paper presents a benchmarking of two public universities- University of East Sarajevo (UES) and University of Zenica (UNZE). Some of strategic objectives of both universities are: implementation of the Bologna process, participation in different types of projects worldwide, mobility of (non)teaching staffs and students, raising quality level of curriculums, folding different types of agreements with other universities, membership in domestic and international networks, etc. So, comparing basic institutional processes with each other leads to innovative practice for improved organizational performances. This helps a lot in promotion of a new way of market behavior that could be characterized as competition through cooperation.

## 2. BENCHMARKING IN HIGHER EDUCATION SECTOR

Benchmarking is a systematic and continuous process of measuring and comparing an organization's business processes to the business processes of leaders anywhere in the world, in order to gain information which will help the organization to take action for improving its performance (APQC). There are many different types of benchmarking. Some of them are: internal benchmarking, external (competitive) benchmarking, functional benchmarking, strategic benchmarking and international benchmarking. All these types of benchmarking have particular applications. Specific steps in benchmarking vary from organization to organization and from country to country, but basic approach is the same. It is consisted of the following: defining problematic areas, selecting indicators, identifying bench marker, collecting and comparing data, giving suggestions for action plans and monitoring. At first, this process may seem easy and simple, but it is not the case. There are a lot of problems, starting from the fact that 'the best practice' in one organization might not be suitable for the other one; wasted time for those who housed inappropriate bench marker; lack of financial and human resources for collecting data; difficulty connected to defining key performing indicators, etc. In general, benchmarking should be related with other tools for improving performances and quality assurance. Therefore, benchmarking is more than just one of modern management tools. Benchmarking in higher education should be considered through the prism of the implementation of the Bologna process, which among others imposes the need for increased cooperation between higher education institutions and continuous quality improvement in whole. In Bosnia and Herzegovina, number of higher education institutions is constantly increasing.

## 3. BENCHMARKING: UNIVERSITY OF EAST SARAJEVO VS. UNIVERSITY OF ZENICA

Benchmarking of University of East Sarajevo (UES) vs. University of Zenica (UNZE) was based on identification, calculation and comparison of key performance indicators (KPI) in area of: financing, human resources, research&development and infrastructure, for the period 2010-2011 (Table 1. and Table 2.). The backgrounds of data collection for KPI were external evaluation reports at both universities and application form for accreditation of higher education institutions-UES. The analysis of KPI were focused on issues of data compatibility in context of identifying own pros and cons at different areas, in order to create strategic platform that would clearly define the directions for continuous improvement of their own performances.

Table 1: Comparative review of key performance indicators (KPI) of University of East Sarajevo and University of Zenica during the period 2010-2011 (financial sector and human resource sector)

Key performance indicators (KPI)		UNIVERSITY OF EAST SARAJEVO		UNIVERSITY OF ZENICA	
Ratio	Indicator/year	Indicator/year		Indicator/year	
		2010.	2011.	2010.	2011.
Total budget/number of students=KPI 1	31387870/13991=2243,43 BAM	35437032/15244=2324,65 BAM	14775135/5755=2567 BAM	13757839/6001=2292 BAM	
Total budget/ number of graduates = KPI 2	31387870/1419 = 22119,71 BAM	35437032/1562 = 22686,96 BAM	14775135/587=25171 BAM	13757839/570=24136 BAM	
Total budget/total number of teaching staff= KPI 3	31387870/957 = 32796,19 BAM	35437032/933 = 37981,81 BAM	14775135/418=35347 BAM	13757839/414=33231 BAM	
Total budget/ total number of full time employed teaching staff= KPI 4	31387870/519 = 60477,59 BAM	35437032/524 = 67627,92 BAM	14775135/267=55337 BAM	13757839/220=62535 BAM	
Total budget/number of full time employees= KPI 5	31387870/906 = 34644,44 BAM	35437032/881 = 40223,64 BAM	14775135/364=40591 BAM	13757839/356=38645 BAM	
Revenues of establisher/ total budget= KPI 6	25327204/31387870 = 80,69 %	26827000/35437032 = 75,7 %	10939576/14775135 = 74 %	10650444/13757839=77 %	
Own revenues/ total budget= KPI 7	6061666/31387870 = 19,3 %	8610032/35437032 = 24,29 %	3746583/14775135 = 24 %	2755304/13757839=20 %	
Human resource indicators	Number of students/ total number of teaching staff= KPI 1	13991/ 957 = 14,61	15244/ 933 = 16,33	5755/418 = 13,76	6001/414=14,49
	Number of students/number of full time employed teaching staff= KPI 2	13991/519 = 26,95	15244/524 = 29,09	5755/267=21,55	6001/220=27,28
	Number of students/ number of non-teaching staff= KPI 3	13991/387 = 36,15	15244/357= 42,7	5755/187= 30,77	6001/184 = 32,61
	Number of full time employed teaching staff/ total number of non-teaching staff= KPI 4	957/387 = 2,47	933/357 = 2,61	418/187=2,23	414/184=2,25

During the period 2010-2011: number of students and graduates had increased at both universities; in structure of total budget: revenues of establisher and own revenues had increased at the UES, and slightly decreased at the UNZE. Therefore, as own revenues increased at UES, KPI 7 increased too, from 19.30% in 2010. to 24.29% in 2011. Consequently, KPI 6 declined for 4.99%. Over the same period, at UNZE KPI 6 increased for 3%, subsequently followed by decline of KPI 7 for the same percent. The figures on those indicators confirm the fact that they will have sustainable trend related to universities ability to improve its competitiveness and self-sustainability. In human resource sector, between 2010 and 2011 all KPI (KPI 1, KPI 2, KPI3 and KPI 4) had increased, at both universities. In research and development (RD) sector(*Table 2*), KPI had slight increased at both universities, but during 2010-2011 KPI 1 and KPI 2 were triple lower at UES vs. UNZE, as well as KPI 3. Indicators KPI 4 and KPI 5 had modest change at both universities. Comparison of KPI of UES and UNZE in RD sector had indicated that UES was lagging behind the UNZE in RDI sector due to a lower level of: national/international projects, scientific and artistic events, publications in relevant databases and mobility of teaching staff and students, also. In general, there is a very high correlation between theirs (universities) RDI intensity and the overall BIH RD intensity. At the moment, the share of government budget for RDI in total government expenditure is quite modest. During 2010-2011, infrastructural indicators (*Table 2.*) didn't have significant change at UNZE. Moreover, KPI 1, KPI 2 and KPI 4 remained at the same level. Nevertheless, KPI 3 declined from 204.35 in 2010 to 181.66 in 2011. Also, over that period, total surface of libraries and classrooms had increased at UES. The result is a slight increase in KPI 1 from 918.11 in 2010 to 1036.7 in 2011. Similarly, KPI 3 increased from 98.73 in 2010 to 132.58 in 2011. The explanation for the gap between KPI 2 and KPI 4 (UES vs. UNZE) could be simply the fact that UNZE had outperformed UES in technical equipment, mostly thanks to TEMPUS projects support.

*Table 2: Comparative review of key performance indicators (KPI) of University of East Sarajevo and University of Zenica during the period 2010-2011(r&d sector and infrastructural sector)*

Key performance indicators (KPI)		UNIVERSITY OF EAST SARAJEVO		UNIVERSITY OF ZENICA	
		Indicator/year		Indicator/year	
		2010.	2011.	2010.	2011.
Research & development indicators	Ratio				
	Number of projects/ number of organizational units= KPI 1	79/ 17 = 4,64	53/ 17 = 3,11	95 / 8 = 11,87	85 / 9=9,44
	Number of projects/ number of teaching staff= KPI 2	79/ 957 = 0,08	53/ 933 = 0,05	95 / 418 = 0,23	85 / 414=0,21
	Number of scientific and artistic events/number of organizational units= KPI 3	9/ 17 = 0,52	14/17 = 0,82	30 /9 =3,33	34 / 9=3,77
	Number of publications published in relevant databases/number of teaching staff= KPI 4	76/ 957 = 0,08	55/ 933 = 0,05	43 / 418 =0,10	39 / 414=0,09
	Number of publications published in relevant databases/number of organizational units= KPI 5	76/ 17 = 4,47	55/ 17 = 3,23	43 / 9 = 4,77	39 / 9=4,33
Infrastructural indicators	Total surface of classrooms/ number of organizational units= KPI 1	15607,88/ 17 = 918,11	17623,91/ 17 = 1036,7	26000 / 9 = 2888,88	26000 / 9 = 2888,88
	Number of computers for teaching process/number of organizational units= KPI 2	556/ 17 =32,7	452/ 17 = 26,58	710 /9= 78,88	710 /9= 78,88
	Total surface of libraries and classrooms/ number of organizational units= KPI 3	1678,52/ 17 = 98,73	2253,9/ 17 = 132,58	1635 / 8 = 204,35	1635 / 9=181,66
	Number of computers for teaching process/number of students= KPI 4	556/ 13991 = 0,04	452/ 15244 = 0,03	710 /5 755= 0,12	710 /6001= 0,118

In order to obtain a comprehensive picture of performances of those two public universities, we analyzed their ranking by WEBOMETRICS, based upon indicators of universities web presence (as adequate platform for the internationalization of the universities): size(S), visibility (V), rich files(R) and scholar (Sc). According to the Webometrics ranking of world universities (January 2012), world rank of UNZE was 3034(S: 2526; V: 6461; R: 2441; Sc: 2223) and UES was 19 984(S: 8927; V: 20279; R: 7676; Sc: 9576). The world rank of the UES, itself and vs. UNZE, indicated alarming

situation, especially having in mind that it was founded 20 years ago, unlike the UNZE which was founded 7 years ago. In that context, one of the things that should be noted relates to the period of an integrated university, which is nearly 6 years at the UNZE and in case of the UES approximately 3 years. Definitely, that process preferred the UNZE in terms of a larger reference collection period at the university level and sense of belonging to the university as whole. Unfortunately, that process is still at an early stage, at the UES. In general, the low level of web indicators was reflection of problematic area of web publications, feedback external links/in links and pages of web site as an obvious consequence of insufficient academic, research and publication activities. But, some profound reasons for such ranking (particularly poor ranking of the UES) should be considered throughout prism of: inadequate mobility of teaching staff, researchers and students; deficiency of regional and international projects and cooperation; unsatisfactory number of scientific/ artistic events and publications published in relevant databases; decreasing number of full time employees; lack of total surface of classrooms, libraries and technical equipment; mainly reliance on revenues of establisher; slow implementation of any reform; disloyal competition of private higher education institutions, etc. By taking concrete and continuous actions, both universities must strive to overcome these deficiencies. On this issue, UNZE vs. UES has already made significant progress. The spectre of initiatives range from establishing: stakeholders' forum, Entrepreneurship and Innovation Centre, the Metallurgical Institute "Kemal Kapetanović" to organizing traditional conferences (whopping over 10 annually), such as: TMT, QUALITY, TEHNO-EDUCA, EMFM, etc. In that area, the UES has made just symbolic steps, starting with: INFO-TEH, RT-SEE-2012 and COMETA. Assuming participation in international research and mobility projects, the UNZE preceded. Moreover, the QA system at the UNZE operates very well due to preparation of the annual internal evaluations by its organizational units, over the past 6 years. The QA system at the UES has been well established, also. The Committee's work has getting better and better every day, but there is much scope for improvement in the next period. Despite all efforts, the UNZE is facing with great problems, also. This is evident observing the financial and human resource indicators, specially the following ratios: total budget/total number of teaching staff, total budget/ total number of full time employees and number of students/ number of full time employed teaching staff.

#### **4. CONCLUSION**

Nowadays, it is unimaginable to operate independently of the other. Results of benchmarking of UES vs. UNZE indicate that there are spaces for improvement in all sectors. Combining the criteria used for the world universities ranking with KPI trends, helped us to create the guidelines for improvements, tailored to this research. In this particular case, it refers to: strengthening the position of the universities on the market through high quality and more attractive study programs; modification of current methods of financing and functioning of the universities and its organizational units towards less dependence on the funds of establisher; continuously attracting and retaining the full-time employees through the creation of better working conditions, conditions for progress and involvement in mobility programs; opening the new centers and institutes as a precondition of stronger cooperation among other institutions; enactment the rulebooks for funding research activities; stressing the importance of students mobility; reconsidering temporary web policy aimed to promote substantial increase of their e-publications and better visibility of the universities; better promotion of the universities by organizing various research/scientific and art events, and so on. In near future, the universities will have very important and demanding mission, reflected throughout: producing of high quality workforce, developing and transferring technologic innovations and raising the level of knowledge in the region. Consequently, this will imply a greater involvement and undertaking actions of all levels of authority in the state. In addition, the forefront policy issues should be supported by monitoring the progress through appropriate key performance indicators as well as ranking systems for benefit of higher education as a whole.

#### **5. REFERENCES**

- [1] Petković D., Plančić I. : Kvalitet u visokom obrazovanju: izazovi i nedoumice, EF UNZE, 2008
- [2] Hamalainen K., Hamalainen K, Jessen D. A., Kaartinen-Koutaniemi M., Kristoffersen D. : Benchmarking in the improvement of higher education, ENQA Report, Finland, 2003
- [3] Burquel N.: Benchmarking in European Higher Education, ENQA Seminar, Helsinki, 2011