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LINKING HIGHER EDUCATION AND ECONOMY AS A ROLE FOR REGIONAL DEVELOPMENT

POVEZIVANJE VISOKOG OBRAZOVANJA I GOSPODARSTVA KAO KLJUČNA ULOGA REGIONALNOG RAZVOJA

ABSTRACT

Higher education, research and innovation play a crucial role in supporting social cohesion, economic growth and global competitiveness. Broader access to higher education by linking with the economy is an opportunity for higher education institutions to make use of a new richness of diverse individual experiences for empowering the development of the local community. Main objective of the paper is by evaluating necessary skills for current and future needs of the economy to find out whether the Croatian education system is able to acquire knowledge and skills relevant to the current needs of the economy. Research has been conducted among graduated (alumni) students at the University of Osijek who by using knowledge and skills acquired in the study successfully perform work in the profession. This target group of respondents is particularly interesting because the five year lag of working in the profession, can give a clear picture of the quality of educational programs which are important for development of the individual, on one hand, and for development of the local community, on the other hand. Reliable and validated KVALIMETAR measuring instrument has been used to compare perception results, among graduated (alumni) students, in two waves of measuring: 2009 year and 2014 year. By comparing the results of the research it will be detected critical points in the quality management system as well as to ensure quality guidelines for increasing the level of satisfaction of all stakeholders as well as the overall quality level of the University. The significance of this research is also in the connectivity needs of the labor market with the implementation of educational programs and linking the evaluation of learning outcomes that create a baseline in the alignment of the Croatian Qualifications Framework (CQF) with the European Qualifications Framework (EQF).

Key words: quality, research, higher education, KVALIMETAR measuring instrument

SAŽETAK

Visoko obrazovanje, istraživanje i inovacije imaju ključnu ulogu u održavanju socijalne kohezije, gospodarskog rasta te globalne konkurentnosti. Širi pristup visokom obrazovanju kroz povezivanje sa gospodarstvom predstavlja izvrsnu priliku za visoko obrazovne institucije da kroz bogatstvo različitih pojedinačnih iskustava osnažuju razvoj lokalne zajednice.

Glavni je cilj rada kroz procjenu vještina potrebitih gospodarstvu utvrditi je li hrvatski obrazovni sustav u mogućnosti stjecati znanja i vještine relevantne trenutnim potrebama gospodarstva. Istraživanje je provedeno na uzorku diplomiranih (bivših) studenata Sveučilišta u Osijeku, koji pomoću znanja i vještina stečenih na studiju uspješno obavljaju posao u struci. Ova ciljna skupina ispitanika posebno je zanimljiva jer s odmakom od pet godina rada u struci, mogu dati jasnu sliku o kvaliteti obrazovnih programa koji su važni

kako za razvoj pojedinca, s jedne strane, tako i za razvoj lokalne zajednice, s druge strane. Pouzdan i valjan KVALIMETAR mjerni instrument korišten je kako bi se usporedili rezultati percepcije između diplomiranih (bivših) studenata, u dva vala mjerenja: 2009 i 2014 godine. Uspoređujući rezultate istraživanja detektirane su kritične točke u sustavu upravljanja kvalitetom, kao i smjernice za povećanje razine zadovoljstva svih zainteresiranih strana, ali i ukupnu razinu kvalitete na Sveučilištu.

Značaj ovog istraživanja nalazi se u potrebi povezivanja tržišta rada s provedbom studijskih programa ali i kroz povezivanje ishoda učenja stvoriti osnovicu za usklađivanje Hrvatskog kvalifikacijskog okvira (HKO) s Europskim kvalifikacijskim okvirom (EKO).

Ključne riječi: kvaliteta, istraživanje, visoko obrazovanje, KVALIMETAR mjerni instrument

1. Introduction

Strategy Europe 2020 issues a vision of the European social market economy for the following decade, which is socially conscious and is based on three priority fields: smart growth (stimulating the knowledge, innovation, education and digital society), sustainable development (more effective and „greener“ production) and social inclusion (increasing the participation on the labor market, gaining skills and struggling against poverty). One of the main goals of the strategy is increasing the level of education, through preventing the early abandonment of education on one side, and through active increase of the generation (30-34 years of age) that has finished their higher education (to at least 40% by 2020) on the other. Europe 2020 suggests following priorities in the field of education (European Commission, 2014); *Innovation union*: better connection of education, entrepreneurship, surveys and innovations, especially with a goal of bridging the gap between the science and the market; *Youth on the move*: enhancing the efficiency of higher education, increasing the quality of education (with fostering the excellence and fairness) and encouraging the mobility in higher education; *An agenda for acquisition of new skills and creating new work positions*: enabling the lifelong learning, especially for the groups with lower education level, enabling the flexible learning ways, especially among different educational and training sectors and reinforcement of the vocational education's appeal; *European platform against poverty*: developing programs for equal opportunities in education, training and on the labour market for sensitive and socially endangered groups. National Strategic Reference Framework (2013) recognizes the importance of the education that can permanently give the greatest contribution to the social development. Therefore, Strategic Framework states the necessity of increasing the extent of highly educated people in the total population and raising the total expenses given for the education, as well as increasing the effectiveness of the available resources' disbursement. In this context one should observe the investments in education and treat them as investments in regional development, although it sometimes will not meet the short-term goals of the growth. Expectations by the local economy and society representatives raise new assignments and challenges for the modern universities. Therefore, it is of utmost importance that the universities reassess their role in the regional development in order to become more ready to meet the needs of the regional economy and the society as a whole. Consequently, the wider approach to higher education through connecting with the economy presents an extraordinary opportunity for the institutions of higher education to empower the local community's development through the profusion of various individual experiences. On the other hand, it is possible that a region can also receive long-term economic benefits from having a university in its location through the knowledge effect, referring to the knowledge production and technology transfer function of university (Hui-chen Wang, 2010,2). Another source of knowledge effect is the education function of the institutions, namely, the production of human capital. Because universities are producers of educated workers, an area located around the university is likely to have a higher concentration of skilled workers. The

higher earnings of faculty graduates would add to the regional income, and the better-trained workers may have a higher potential to start-up or attract new firms. An increase in the supply of highly educated labor may also lead to increased productivity, increased capacity to perform research and development activities, and increased absorption capacity (Smith, Drabenstott, 1999). The impact of the university on economic growth is the strongest when they are adapted to the economic structure of the local economy, which means that universities can focus partly on the creation of new industries, and much of the increase in the ability of companies to adapt to market requirements and to successfully compete in a market that is constantly changing (Škare, Lacmanović, 2013, 331).

2. Role of the alumni student experiences in the regional development

Alumni experience is relevant in assessing the quality of services provided by their faculty, as also expressed by Bauer and Bennett (2001) that faculties and universities are increasingly calling upon alumni to provide critical assessments of the institution's performance in preparing students to lead active and rewarding lives. Denny John P. (2012) postulate that the outcomes approach to alumni assessment rests on the assumption that institutional quality and effectiveness can be appraised on what alumni have accomplished in the years following degree completion.

Escobar (2008) opined that alumni can give an institution useful feedback on how well it is doing its job and their satisfaction with the faculty. Parkyn (1991) notes that a continued effort at measuring the perceptions of alumni shows them that they are still a valued constituent for the faculty and permits current students to benefit from the insights gathered via such a study. In addition, Purezer and Rooney (2002) assert that alumni surveys are utilized to refine the goals, and methods in the educational enterprise. Furthermore, alumni surveys are commonly used to determine postgraduate outcomes, to obtain feedback on program effectiveness, and to fulfill accreditation requirements (Borden 2005). Alumni feedback is important because it can highlight an institution's strengths and weaknesses in order to promote and improve performance, make students and the general public see what graduates of the institution experienced while in faculty, and ensure transparency in the institution. Thus, better understanding the relationship between faculty experience and alumni behaviours is very important both to management of higher education and to the public at large.

Concerning the aforementioned, some authors have tried to define the value of high education by using a mathematical function (Doost, 1999,270). With such approach, the value of university (VU) can be observed as a function of faculty knowledge and abilities (F), positive interaction among the faculties (FF), interaction of the faculties with the students (FS), efficiency of the administration (A), administrative support of the faculty and the students (AFS) and public perception of the product quality delivered by the university (PP). Interaction among the aforementioned elements could be expressed in the shape of an equation: $VU = f(F, FF, FS, A, AFS, PP)$. By debating the value and the role of university in society, it is important to mention that science and scientists have always been expected to be critical towards the dogmas and prejudice, and to contribute the development of the society by practicing critical thinking (Škare, Lacmanović, 2012, 328).

3. Research methodology

In order to answer the research aim concerning the assessment of the skills necessary for the economy, the task was to deduce whether the Croatian education system, in this case the University of Osijek, is able to provide knowledge and skills relevant for the current economic needs.

With the aim of conducting a research, a reliable and valid measuring instrument named KVALIMETAR was used on the sample of graduate students at University of Osijek in two

measuring periods; 2009 and 2014, in order to examine to which extent the acquired knowledge and skills are successfully applied in the performance of the work tasks in the profession and whether the (dis)contentment of the ex students has changed after five years. KVALIMETAR measuring instrument (Legčević et al., 2011, 275) consists of 31 statements grouped into five dimensions: teaching staff (deals with motivation, competence, and communication of the scientific staff, usage of teaching aids and modern technology, regular lectures, valid and objective knowledge grading, courtesy during office hours), administrative staff (includes availability, decent attitude towards the students, duly handling of the students' requests and inquiries, reporting on new changes in the schedule, and precise handling of students' documents), image (includes the reputation of the faculty, qualified teaching staff, finishing the education with the ability to transfer knowledge and skills), environment and equipment (includes the environment and the equipment necessary for learning and teaching, which are: libraries, laboratories, workshops, IT classrooms, lighting and classroom cleanliness, adequacy and accessibility of the literature) and programs of studying and teaching syllabus (includes clear objectives and guidelines, various programs of studying intended for student education). Encompassed research is a part of a project approved by the University J. J. Strossmayer named: KVALIMETAR with the function of improving the quality in educational sector. The research was conducted using the web application www.surveymonkey.com where the official notifications concerning the conduct of the research were forwarded to the presidents of the Quality Committee on each faculty of the University via Center for Quality. The research was conducted through January, February and March 2014. A self-administered, structured questionnaire was pre-tested on a sample of twenty five (25) alumni students. Adjustments were made based on the pre-test to get a more effective instrument. After that the questionnaire was finally administered to the alumni through the above mentioned web link. Since high predictive validity was of major concern, a five-point Likert scale was used. The Likert scale ranged from strongly disagree to strongly agree for alumni rating of all defined statements of the questionnaire.

3.1. Sample

The first sample of the alumni students (n=121) was questioned in the summer semester of the academic year 2008/2009 with the goal of measuring perception of quality in order to examine whether the perspective of the alumni students change after offering their knowledge and skills on the labor market. This preliminary research, which was designed at the educational constituents level of the University in 2009, showed that the interest of the alumni students who had, in significant numbers, emphasized that the attempt of quantifying the quality urges them towards a more whole contemplation on the topic and had expressed a critical attitude towards the quality of study. The second sample of the alumni students (n=138) was questioned in the January – March 2014 time period, with the goal of measuring similarities and differences in the perception of the examinees with the regard to the first sample in order to define the space for possible improvement and determine the current contribution of the high education to the regional development based on the differences in samples.

3.2. Survey results and discussion

The first sample of graduate students (n=121) was comprised of 36,4% male and 63,6% female examinees, by which the greatest group of alumni students was the one aged 25 to 28 (46,2%), while the least represented group was the one aged 34 to 35 (4,2%). The biggest part of the alumni students was from the Faculty of Law (20,7%) and Faculty of Economics (40,5%), while the smallest was from the Faculty of Food Technology (1,7%) and the Faculty of Medicine (2,5%), by which the 89,3% of the total number of students attending a regular

program with the Ministry of Education and Sports' grant, while 10,7% studied as non-regular students.

The second sample of graduate students (n=138) was comprised of 65% female and 35% male examinees, in which most of the students took a regular program with the Ministry of Education and Sports' grant (89%), while a small part of them studied in the framework of non-regular program (11%). The biggest part of the alumni students examined was from the Faculty of Law (17,4%), the Faculty of Food Technology (14,5%), while the smallest part was from the Department of Mathematics (0,7%). The data worth mentioning are the average grades during the study, as well as the lecture attendance where it is clear from the tables (Table 1 and Table 2) that this small group of examined alumni students had regularly attended the lectures (73,9%), but also had a good (43,5%) grade average.

Table 1 Attendance to classes

| Attendance to class | Relative frequencies (%) |
|---------------------|--------------------------|
| -25% | 3,6 |
| 25-50% | 3,6 |
| 50-75% | 18,8 |
| 75% - | 73,9 |
| Total | 100 |

Source: Author, 2014

Table 2 Grade point average

| Grade point average | Relative frequencies (%) |
|---------------------|--------------------------|
| Sufficient | 27,5 |
| Good | 43,5 |
| Very good | 25,4 |
| No response | 3,6 |
| Total | 100 |

Source: Author, 2014

After comparing both alumni students samples in two measuring periods (2009 and 2014), one can conclude that the samples are of similar demographic structure. In order to compare the samples more minutely and give answers to the enquired research goals dealing with the perception of the alumni students in the field of knowledge and skills application in the working environment, the research moved towards verifying the factor structure of the alumni students in 2014, comparing it with research year 2009.

Table 3 Factor analysis of the KVALIMETAR measuring instrument on the sample of alumni students in the second wave of measuring (year 2014)

| STATEMENT | F1 | F2 | F3 |
|---|------|------|------|
| Administrative staff is available and ready to provide students with | | .855 | |
| Administrative staff treats students with respect and dignity. | | .860 | |
| Administrative staff deals with students' enquiries in a prompt and ... | | .884 | |
| Administrative staff helps students with respect to providing ... | | .899 | |
| Professors and teaching assistants give an impression of love and ... | .819 | | |
| Professors and teaching assistants are highly motivated for doing their | .807 | | |
| When teaching, professors and teaching assistants seem to have proper ... | .767 | | |
| Using teaching tools and modern technology, professors and teaching... | .457 | | |
| Professors and teaching assistants hold classes, seminars and practices ... | .488 | | |
| Professors and teaching assistants encourage students to actively participate.. | .669 | | |
| Professors and teaching assistants assess students' performance ... | .792 | | |
| Professors and teaching assistants are available and friendly to students... | .762 | | |
| Professors and teaching assistants possess proper communication skills ... | .782 | | |
| Professors and teaching assistants are available and willing to receive ... | .653 | | |
| Professors and teaching assistants can also be reached after classes... | .723 | | |
| Faculty is characterized by its professional image... | | | .664 |
| After the studying, students are capable of transferring acquired knowledge. | | | .546 |
| Faculty includes adequately qualified teaching staff... | | | .589 |
| Faculty possesses appropriate equipment necessary for organization ... | | | .770 |

| | | | |
|--|--|------|------|
| Faculty manages with adequate rooms for teaching and studying ... | | | .821 |
| Illumination and cleanliness of classrooms are also adequate ... | | | |
| Faculty owns teaching tools as well as adequate and available literature... | | | |
| Student access to faculty classrooms/rooms is at a proper level... | | | |
| Student access to IT classrooms is at a proper level... | | | |
| Curriculum and teaching plans contain clear goals and guidelines... | | | .626 |
| Curriculum standard matches the acquired level of qualifications.... | | | .527 |
| Faculty as an entity offers various curriculums (majors) intended ... | | | |
| Goals and guidelines of curriculums are harmonized with course contents... | | | |
| Students' applications and enquiries are timely and accurately dealt with... | | .599 | |
| Student office keeps records of students properly and precisely... | | .712 | |
| Students are timely informed by the faculty on current changes of course... | | .411 | |

Source: Author, 2014

Based on the factor analysis (Table 3) conducted on the sample of the alumni students examined in 2014, three interpretive, reliable factors were extracted. The first factor encompasses the items which match in content the dimension “*Teaching staff*”, the second factor matches the dimension “*Administrative staff*”, and the third factor encompasses the items of other three dimensions of KVALIMETAR measuring instrument, “*Image*”, “*Environment and equipment*”, and “*Programs of study and teaching syllabi*”, hence the title of the factor, “*Ensuring the performance quality*”. All of the items showed correlation with the total result above ,50, while the Cronbach Alpha reliability coefficients for individual factors were in order ,93, ,88, ,91.

It is interesting to compare the factor structure of the alumni students examined in 2009, by which the three interpretive factors were singled out: “*Environment and equipment*”, “*Administrative staff*”, “*Intrinsic faculty values*” (Teaching staff, Image, Programs of study and teaching syllabus).

Based on the conducted analysis, it is evident that both observed samples believe that in quality management of high education one must pay attention to the four key factors: *quality of the teaching staff* (decency, methodological skills, professional competence, good communication skills in the relationship with students), *quality of the administrative staff* (competence, decency and promptness), *quality of the study programs and teaching syllabi* (clear objectives and guidelines of the study programs and plans understood by the students and teachers, quality lectures with regular holding, valid grading), and *quality environment and equipment* (satisfying lighting, classroom cleanliness, adequate teaching aids, accessibility of the literature).

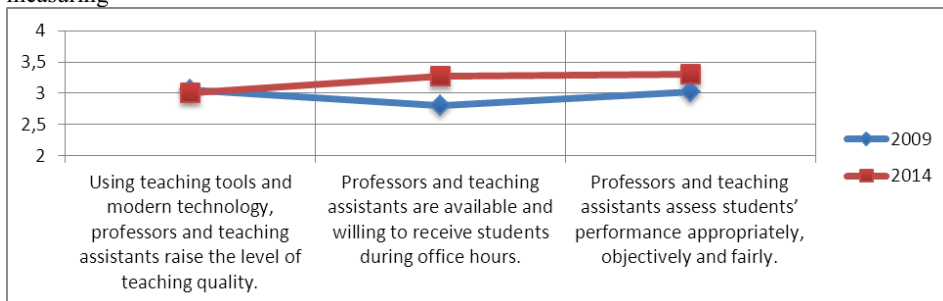
Both examined samples perceive the quality of high education institutions which they attended through the frame of the quality and competence of the teaching staff executing the programs of study in available spaces of the individual high education constituents, by using adequate equipment, which is all mutually imbued with promptness of the administrative staff that is available for helping the current students, as well as the former ones and the total teaching staff.

Considering the fact that on the basis of the conducted factor analysis the results, as perceived by the alumni students examined, had not changed, it seemed useful to enter into each dimension of the KVALIMETAR measuring instrument and examine the scope of the average response values with the goal of detecting the critical spots and the guidelines for connecting the labor market with the execution of the study programs, which represents an extraordinary opportunity for the high education institutions to reinforce the local community development through the profusion of various individual experiences.

On the basis of the deeper analysis in the “*Teaching staff*” dimension’s structure, the examined sample of the alumni students and their average values of the dimension in both research periods (2009 = 3,24; 2014 = 3,47) show that the lowest average values were assigned to the same statements, which means that the five year gap did not bring the

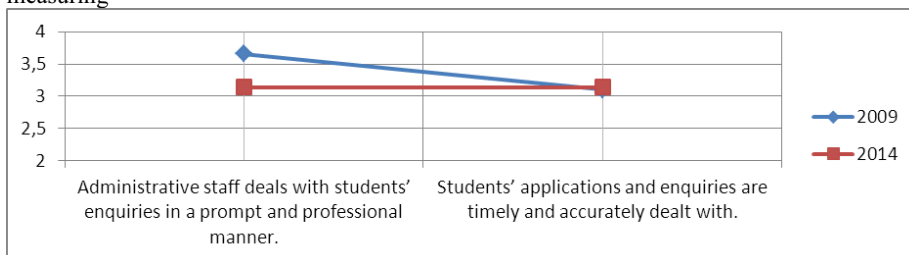
change in examinees' perception. The examinees emphasize that the key areas for improvement in this dimension are: *“Valid and objective grading”*, *“Contacting the lecturer outside the lecture”* and *“Usage of new technologies in teaching”* (Chart 1).

Chart 1 Lowest average grades in the dimension “Teaching staff” in the two waves of measuring



In the framework of the *“Administrative staff”* dimension, the examined sample of the alumni students and their average values of the dimension in both research periods (2009 = 3,31; 2014; 3,59) show that the same statements were assigned the lowest average values. The examinees emphasize that the key areas for improvement in this dimension are: *“Duly handling with the students' requests and inquiries”* and *“Decent attitude towards the students”* (Chart 2).

Chart 2 Lowest average grades in the dimension “Administrative staff” in the two waves of measuring



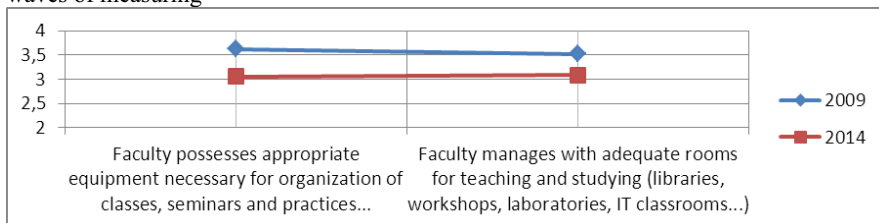
In the framework of the *“Programs of study and teaching syllabi”* the examined sample of the alumni students and their average values of the dimension in both research periods (2009 = 3,27; 2014 = 3,43) show that the same statements were assigned the lowest average values. The examinees emphasize that the key areas for improvement in this dimension are *“Various programs and courses of studying intended for student education”* (2009 = 2,97; 2014 = 3,14).

In the framework of the *“Faculty image”* dimension, the examined sample of the alumni students and their average values of the dimension in both research periods (2009 = 3,41; 2014 = 3,40) show that the same statement was assigned the lowest average value and that it represents the area for the possible improvement: *“Finishing the education with the ability to transfer knowledge and skills”* (2009 = 3,09; 2014 = 3,28).

Concerning the dimension *“Environment and equipment”*, the examined sample of the alumni students and their average values of the dimension in both research periods (2009 =

3,72; 2014 = 3,35) show that the same statements were assigned the lowest average values and that they represent the area for the possible improvement: *“Adequately equipped classrooms for lectures, seminars, tutorials...”* (2009 = 3,52; 2014 = 3,09)

Graph 3 Lowest average grades in the dimension “Environment and equipment” in the two waves of measuring



On the basis of the comparison of the alumni perceptions expressed in the average scores across all five dimensions KVALIMETAR measuring instrument in two observation periods, the same conduct patterns were noted. The average values across all dimensions were in favor of 2014, except in the dimensions *“Image”* and *“Environment and equipment”*. Within these two dimensions, the average perception of respondents differed in favor of the first sample, year 2009, by which the statements were assigned higher average scores of 2009 in relation to year 2014.

In the following analysis it seemed important to examine whether the perceptions of examined alumni students differed significantly in statistics given the socio-demographic variables: *gender, age, grade point average, study status* and *employment*. One-way analysis of the variant did not show statistically significant differences only within the variable employment. Contrary to expectations, the difference was not found in the (dis)satisfaction with the quality of education between the employed and unemployed respondents, nor between the different levels of study. It is interesting to note that in both samples the results of perception did not differ with respect to unemployment, while the portion in 2009 was 13% of the unemployed in relation to the total number of participants, while in 2014 that number amounted to 32% of the unemployed, by which the perceptions of alumni students did not differ. Differences were noted between the alumni students with better grade point average and regular attendance (50-75% and more than 75%) and those of weaker GPA and rare attendance, while students with higher averages and regular school attendance perceive all the elements in the provision of educational service with higher grades. Such results were expected in regard to the development of critical thinking in respondents and certain realized and unrealized experiences in the educational process.

Based on the conducted analysis of the alumni student samples across all dimensions of the measuring instrument, the areas which represent the points for improvement of satisfaction were distinguished. First of all, by continuous communication with graduates, there is an attempt to determine their wishes and needs, as well as to accept their propositions and remarks by following their views and thoughts about the study aims in order to improve the quality of the teaching process and profile new teaching curricula. The aforementioned facts should be taken into account in the process of planning the future educational programs in order to improve the quality of education at the University of Osijek and to meet the demands of the modern business environment. Therefore, greater emphasis should be placed on the growing demands of modern business because in this way the link between the different areas of the local community, higher education institutions and alumni is accomplished and the quality basis for their long-term cooperation to the satisfaction of all parties is created.

Academic program is one of the important activities of any faculty or university; it forms part of faculty's activities that are assessed for the purpose of accreditation. Faculty performance is therefore an area that is frequently addressed in the accreditation process for many programs. This is in line with Escobar (2008) assertion that faculty performance is a component typically mentioned in alumni surveys as well as in mission statements. An other issue that drives the performance of a faculty and seen as relevant activity of any faculty or university is instruction quality. The quality of instruction is underpinned by the quality of teaching staff, availability of resources such as well equipped library, laboratory, workshops, quality classrooms, computer and internet access, among others. In the view of Escobar (2008), faculty have a big influence in shaping the education of faculty students; they are supposed to be knowledgeable of the material that they teach, and have an interest in students academic success.

In the context of the above mentioned, and in response to a survey conducted, the system of higher education of the University of Osijek should be first of all implemented with the following changes: raising the quality of higher education primarily through investment in education of the research-teaching staff and through training of the administrative staff posing as a quality support to the academic and administrative activities of the university, updating the content of curricula, improving communication with representatives of the regional economy, modernization and upgrading of university library holdings, encouragement of communication with alumni, development and additional training through the programs of lifelong learning.

4. Conclusion

The impact of higher education on the local region is the strongest when universities and faculties understand what they can offer to the economy and society as a whole. Regional development involves the process of improving the standard of living and the quality of life of all citizens of the region, and in this context the paper analyzed the contribution of the University of Osijek to the development of the region through the perception of the target group of respondents, alumni students, who represent valuable on which one should build the recognition and competitiveness. The task of universities is to permanently cultivate the character of a public institution and demonstrate to itself and the region the value it possesses for its regional economy and the society as a whole, where by communication they provide a public space for discussing the current economic and social issues. Based on the analysis of the perceptions of alumni students in two periods of measurement, year 2009 (n = 121) and year 2014 (n = 138) the same patterns of behavior were observed, in which the average score of the dimensions examined are, on average, higher in 2014, in relation to the measure taken five years ago, by which one can conclude that all the necessary resources in providing quality educational services had improved, indicating a significant positive shift in quality of the higher education at the University of Osijek in responding to the needs of the economy and the society of the region. However, these results should be maintained and there should be a more active monitoring of the labor market needs and coordination of the acquired competencies with the employers' wishes and needs. It will thus be possible to create a competitive workforce through adaptation of the programs of study, through introducing the programs for lifelong learning, but also through linking learning outcomes in order to create a basis for harmonization of the Croatian Qualifications Framework (CQF) with the European Qualifications Framework (EQF), by which the University of Osijek will improve competitiveness and image on the market.

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