Employability of University Graduates in Slovak Labour Market

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Abstract
Currently, there are even more discussions about the employment of university graduates in the labour market in relation to the quality of universities and higher education. Universities face many of the challenges posed by the concept of sustainable development. One of them is the preparation of students to develop the ability to integrate social, environmental and economic considerations in future decision making. Employers require not only professional knowledge from graduates, but even more, they emphasize soft skills. Our results of the survey show that most university graduates are satisfied with their study programs, although the proportion of satisfied graduates varies statistically significantly among the fields of study. However, we must not forget the dissatisfied students and take adequate measures to increase the proportion of students that are satisfied with their study program in each field of study, which can contribute to reducing the outflow of students abroad.

Keywords: employment, labour market, quality of education, university graduates

JEL Classification: I00, J40, E24

1. Introduction
Education is widely considered to be the most important form of human capital (Becker, 1993). In order for education to fulfill this role, it must accept the demands of the labor market at the national and international levels. Nowadays, the skills, such as specific skills, high-tech skills, creativity and adaptability of employees are needed in the labour market. There is increasing awareness in the academic and societal debate on sustainable development and some of the most urgent global problems such as food insecurity, climate change, biodiversity loss, and persisting poverty (Lazarus, 2009; Meckling, 2011; Levin et al., 2012). The need for sustainable development has become evident during the last decades, implying that universities are expected to prepare students to develop the ability to integrate social, environmental and economic considerations in future decision making (Czykiel, R. et al, 2015; Lozano et al., 2013; Sibbel, 2009). These changes in the labour market and in society should be reflected by the whole education system, including universities (Kittová, Druzbacka, 2020). Moreover, the role of universities in education for sustainable development has been encouraged in many declarations and initiatives (Brundtland, 1987; Dlouhá et al., 2013). According to Milutinovic and Nikoli (2014), the vision of sustainable development in higher education is a world where everyone has the opportunity to benefit from quality education and learn the values, behaviours and lifestyles required for a sustainable future and for positive societal transformation.

A necessary condition for economic development and raising living standards in Slovakia is to address employment issues in a way that would inter alia contribute to employment
EU labour markets have improved significantly. The job vacancy rate, indicating a lack of labour supply for available labour demand, had been rising since 2014 and at the beginning of 2018 reached 2.1% at the EU level (Štefánik et al., 2018). The Slovak labour market is following the EU trend and in the first half of 2018, the unemployment rate was, for the first time since Slovakia joined the EU, slightly below the EU-28 average (Švábová et al., 2019) but compared with the labour markets of the Visegrad group, Slovakia has long been showing the worst values of this indicator (Štefánik et al., 2018) in spite of the fact that the number of graduates in Slovakia is after the mid of the 90’s still increasing. However, the Slovak higher education graduate population is still below the European Union level (Mitková et al., 2018). On the other hand, among EU countries, Slovakia has the second-highest share of students in tertiary education enrolled abroad (Guzi, Fabo, 2020). Martinák and Varsik (2020) find that most Slovak students enrolled in Czech universities study ICT (20 %), engineering (17 %) or medicine (15 %) programmes. Moreover, students complain about insufficient traineeship and education that teaches them foreign language and transferable skills (Minarechová, 2021). Therefore, in our article, we focused on a survey of employability and satisfaction of university graduates according to the field of study.

In Slovakia, there are many universities and higher educational institutions that provide higher education in various fields of study. However, Slovakia has no university in the top 500 ranking of the world’s best universities. Slovak universities are not competitive internationally and therefore less appealing to young Slovaks, who seek education abroad (Guzi, Fabo, 2020). On the other hand, Kittová and Druzbacka (2020) find out that a high level of science and research at a university is not a necessary precondition for the success of its graduates in the labour market. However, Gora et al. (2019) confirmed that the students’ chances of employment in the labour market were positively and directly influenced only by the quality of the educational process and by the research activities. Taking into account these differing views and findings, mainly the question arises if the university graduates in Slovakia are satisfied with their selected study program and what reasons they signed under the dissatisfaction of university graduates.

2. Data and Methods

The aim of the article is to find out how many university graduates have been employed in the labour market and whether they are satisfied with the selected study program. To this end, the following partial targets have been set

- division of graduates into groups according to the field of study
- finding out the share of employed graduates according to the fields of study
- finding out statistically significant differences in the satisfaction of employed graduates of individual study specializations with their studies
- proposals for further surveys and research questions

Data collection was conducted as a part of implementation of a national project and has been made available for the purposes of research activities of the project VEGA-1/0504/21. The database contained answers from 19,518 respondents who completed their studies in the time period from 2008 to 2014. Of these, 2,760 respondents indicated bachelor's degree, as the highest level of achieved education (14.14 %); 12,816 respondents identified master's degree as the highest reached level of education (65.66 %); 539 respondents identified the doctoral type of the study as the highest level of education (2.76 %) and 3,403 respondents did not
provide an answer to this question (17.44%). The research focused on graduates of the master’s degree, because the graduates of the master’s degree are looking for a job in the labor market since most of the bachelor’s degree graduates continue to study at master’s degree and graduates of the PhD study remain usually to work at universities, moreover, they were only a small group of respondents. Of all graduates of master degree, only 11,676 responses were available (91.10% of all master's degree graduates), as 1,140 respondents (8.90% of all master’s degree graduates) were excluded from the research, as the vast majority of the answers to the key questions, were not answered.

The data was processed by elementary statistical methods, graphs, and tables. The Kruskal-Wallis test was used to find out statistically significant differences between graduates of particular fields of study in terms of their satisfaction with the study. The Kruskal-Wallis test was used because of ordinal data that expressed a level of satisfaction with the study. The test statistics of the Kruskal-Wallis test can be calculated from the following formula:

\[ H = \left( \frac{12}{N(N+1)} \cdot \sum_{j=1}^{k} \frac{R_j^2}{n_j} \right) - 3(N + 1) \]  

\[ \text{(1)} \]

H – Kruskal – Wallis test statistics  
N – number of study specializations  
Rj – overall ranking for each group  
nj – the number of respondents in each of these groups  
k – number of groups

The table value is calculated as CHINV (alfa; k-1), where alpha is 0.05 and the number of degrees of freedom is given by k (number of fields of study) minus one.

The statistically significant differences between the individual fields of study were evaluated by means of contrast tests in the Statgraphics program. We presented the results of Fischer’s LSD test as the most appropriate. Fischer’s LSD test confirms a statistically significant difference between two average values of objects included in the relevant group, if the following relation applies:

\[ |\bar{y}_i - \bar{y}_j| \geq t_{\alpha,m(n-1)} \sqrt{\frac{2s_r^2}{n}} \]  

\[ \text{(2)} \]

where \( t_{\alpha,m(n-1)} \) is the critical value of the t-distribution at m (n-1) degrees of freedom; n is the total number of observations, \( s_i \) is the standard error of the mean difference and \( |\bar{y}_i - \bar{y}_j| \) is the distance in rank between the pairs of treatment means to be compared; the means of the two groups being compared.

3. Results and Discussion

An analysis included 11,676 respondents with a master degree education, out of which 9,684 (82.94%) answered the question about their employment positively, meaning they are employed; only 431 (3.69%) is continuing with their studies; 422 (3.61%) is taking care of a child, or another family member and 1,139 (9.76%) were unemployed (Figure 1).
Graduates of the master study programmes (11,676 respondents) came from different universities, with different specializations and backgrounds. For the purpose of the analysis, we divided them into eight groups based on the fields of their studies (economists and lawyers were separated from the social sciences into their own groups, as they represented a large portion of respondents). The particular groups are (Figure 2):

- economics and management (ECO) – 3,026 respondents,
- medical sciences (MS) – 403 respondents,
- pedagogical sciences (PS) – 750 respondents,
- agricultural and forestry sciences (AFS) – 449 respondents,
- law (LAW) – 645 respondents,
- natural sciences (NS) – 459 respondents,
- social sciences and humanities (SSH) – 2,122 respondents,
- technical sciences and informatics (TSI) – 3,822 respondents.

3.1 Employment of graduates in the labour market according to the fields of study

Subsequently, it was analysed whether the respondents found employment, decided on further continuation of their studies, or started taking care of family members taking into account their fields of study. The results are documented in Table 1.
Table 1: Structure of employment of the university graduates according to their fields of study

<table>
<thead>
<tr>
<th>Field of study</th>
<th>Total number of respondents</th>
<th>Employed respondents</th>
<th>Unemployed respondents</th>
<th>Other respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absolute number</td>
<td>Absolute number</td>
<td>Relative number in %</td>
<td>Absolute number</td>
</tr>
<tr>
<td>ECO</td>
<td>3,026</td>
<td>2,544</td>
<td>84.07</td>
<td>295</td>
</tr>
<tr>
<td>MS</td>
<td>403</td>
<td>331</td>
<td>82.13</td>
<td>39</td>
</tr>
<tr>
<td>PS</td>
<td>750</td>
<td>607</td>
<td>80.93</td>
<td>75</td>
</tr>
<tr>
<td>AFS</td>
<td>449</td>
<td>344</td>
<td>76.61</td>
<td>53</td>
</tr>
<tr>
<td>LAW</td>
<td>645</td>
<td>544</td>
<td>84.34</td>
<td>70</td>
</tr>
<tr>
<td>NS</td>
<td>459</td>
<td>324</td>
<td>70.59</td>
<td>55</td>
</tr>
<tr>
<td>SSH</td>
<td>2,122</td>
<td>1,664</td>
<td>78.42</td>
<td>277</td>
</tr>
<tr>
<td>TSI</td>
<td>3,822</td>
<td>3,326</td>
<td>87.02</td>
<td>275</td>
</tr>
<tr>
<td>Together</td>
<td>11,676</td>
<td>9,684</td>
<td>82.94</td>
<td>1,139</td>
</tr>
</tbody>
</table>

Source: own calculations

Table 1 shows that the highest share of unemployed respondents in the labour market is represented by graduates of social sciences and humanities, 13.05% of the total number of respondents in this field of study (especially study programs such as social work, culturology, art history, public policy, philosophy, ethics, andragogy, political science, mass media and marketing communication). In the second and third place, with a share of almost 12%, are graduates of study programs focusing on natural sciences (especially environmental sciences) and agricultural sciences (especially human nutrition, horticulture and landscape engineering). On the contrary, the least unemployed respondents are in technical sciences, followed by medical sciences and economics (low employment particularly in environmental management, tourism, regional development, public administration, economics and business management). From the above mentioned, it can be concluded, that the labour market in Slovakia does not have enough opportunities for graduates with an environmental focus and with a focus on culture, art and public administration. Technical sciences, law, economics and management, followed by medical and pedagogical sciences, have the largest share of respondents who found employment in the labour market.

3.2 Satisfaction of employed graduates with the choice of their study program

It was the group of employed respondents (9,684 respondents), meaning respondents employed in the labour market, which was crucial for further analysis of the satisfaction with the choice of higher education. The structure of respondents according to their satisfaction with the choice of the study program is documented in Figure 3.
Out of the total number of 9,684 employed graduates, 48% are satisfied with their university studies and in case of reselection; they would opt for the same study program at the same university.

A deeper analysis according to fields of study shows that in each field of study, the largest group of respondents chose satisfaction with the study. The largest share of satisfied respondents was achieved by technical sciences (54.90% of all respondents from technical science). The lowest share was found in the natural and social sciences (38% of all respondents with a relevant study program) (Table 2).

**Table 2: Structure of respondents according to the field of study and satisfaction with the study**

<table>
<thead>
<tr>
<th>Field of study</th>
<th>Satisfaction with the study</th>
<th>Respondents satisfied with study program (1)</th>
<th>Respondents unsatisfied with study program (2)</th>
<th>Respondents unsatisfied with the choice of university (3)</th>
<th>Respondents unsatisfied with the choice of university and study program (4)</th>
<th>Respondents would decide not to study (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECO</td>
<td>Count: 1,228</td>
<td>284</td>
<td>201</td>
<td>717</td>
<td>114</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage: 48.27</td>
<td>11.16</td>
<td>7.90</td>
<td>28.18</td>
<td>4.48</td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td>Count: 150</td>
<td>20</td>
<td>41</td>
<td>106</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage: 45.32</td>
<td>6.04</td>
<td>12.39</td>
<td>32.02</td>
<td>4.23</td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td>Count: 246</td>
<td>100</td>
<td>40</td>
<td>196</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage: 40.53</td>
<td>16.47</td>
<td>6.59</td>
<td>32.29</td>
<td>4.12</td>
<td></td>
</tr>
<tr>
<td>AFS</td>
<td>Count: 149</td>
<td>32</td>
<td>28</td>
<td>115</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage: 43.31</td>
<td>9.30</td>
<td>8.14</td>
<td>33.43</td>
<td>5.81</td>
<td></td>
</tr>
<tr>
<td>LAW</td>
<td>Count: 261</td>
<td>38</td>
<td>40</td>
<td>178</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage: 47.98</td>
<td>6.99</td>
<td>7.35</td>
<td>32.72</td>
<td>4.96</td>
<td></td>
</tr>
<tr>
<td>NS</td>
<td>Count: 124</td>
<td>41</td>
<td>25</td>
<td>122</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage: 38.27</td>
<td>12.65</td>
<td>7.72</td>
<td>37.65</td>
<td>3.70</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3: The structure of respondents in terms of satisfaction with university studies in general

*Source: own calculations*
Respondents who would choose another study program at the same school (option 2) may not be satisfied with the chosen study program, either because they did not estimate their interest in what to do professionally or were disappointed by the chosen study program. Therefore, it would be appropriate to broaden the question and find out whether they would choose a related study program (e.g. accounting instead of business economy) or a completely different discipline from another faculty of this university (e.g. biotechnology instead of regional development), otherwise it is not possible to determine whether the respondent is disappointed with the study program or professional orientation he has chosen. The fewest respondents dissatisfied with the choice of the study program are in the fields of law, medical sciences and agricultural sciences. On the contrary, most of them are in pedagogical and technical sciences.

The third option has a greater explanatory power - the respondent would have chosen the same study program, but at a different university. It follows from the above that the respondent is firmly determined for his professional orientation, but he was disappointed by the university, which did not provide him with what he expected, respectively what the labour market expects of him. The fundamental question of the further sustainability of the study program arises here, especially if these answers of the respondents are not negligible. This is a clear signal to the university that the study program must undergo certain changes. The highest percentage of responses in this category was recorded by the medical sciences (12.39%) and the social sciences and humanities (10.10%). On the contrary, the least dissatisfaction is in pedagogical sciences (6.59%) and technical sciences (6.76%).

The second-largest group of respondents (one-fifth to one-third of respondents depending on the field of study) consists of those who would choose a different study program at another university (option 4). From the answers of the respondents, it can be deduced that these respondents did not estimate their professional orientation correctly. Again, however, as in option 2, it would be appropriate to find out whether their choice would lead to a related study program, where the school did not seem to offer the graduates what they needed to enter the labour market or a completely different field of study, which would confirm the presumption of incorrect professional orientation of graduates. Given the high percentage of answers, it is necessary to broaden this question and find out the real cause of the wrong choice. Otherwise, adequate remedial measures cannot be taken, whether it is necessary to adapt the study program more to the needs of the market or whether it is necessary to increase the awareness of secondary school students about study opportunities at universities. It can be assumed, that secondary schools probably lack counsellors for further studies, who would be able to guide students correctly, especially in grammar schools, as these students usually go study specializations with the highest proportion of dissatisfied students. With a high percentage of respondents in each field of study, the highest share exceeding 30% is achieved by natural sciences, social sciences and humanities, pedagogy, agriculture, medical sciences and law. The least respondents dissatisfied with the choice of study program at a given school are in economics (28.18%) and technical sciences (18.64%).

The lowest percentages of respondents (from 4% to 6%) are respondents who would decide not to study at university if they should make the decision again today (option 5). These are
mostly graduates (68.31% of them) who work outside the field of their study, or they work in positions where university education is not required, but also those graduates who work in their field of study, but the chosen professional orientation probably does not fulfil them (31.69% of them).

We used the Kruskal - Wallis test for independent groups to find out if there are statistically significant differences between graduates of individual fields of study in terms of their satisfaction with the study. We can confirm the statistically significant differences by this test (test statistics is 185.575 at p-value = 0.000, based on which we reject the null hypothesis of no statistically significant differences).

Statistically significant differences were found especially between the four groups of fields of study. The results are documented by the Fisher’s LSD test, which found the most statistically significant differences by comparing pairs and created up to four groups of fields of study (Figure 4).

**Figure 4 Results of Fisher’s LSD test**

<table>
<thead>
<tr>
<th>Method: 95.0 percent LSD Count</th>
<th>Mean</th>
<th>Homogeneous Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Col_1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>3222</td>
<td>2.03127 X</td>
</tr>
<tr>
<td>1</td>
<td>2144</td>
<td>2.29442 X</td>
</tr>
<tr>
<td>5</td>
<td>544</td>
<td>2.39706 XX</td>
</tr>
<tr>
<td>3</td>
<td>607</td>
<td>2.42958 XX</td>
</tr>
<tr>
<td>2</td>
<td>331</td>
<td>2.45029 XXX</td>
</tr>
<tr>
<td>4</td>
<td>344</td>
<td>2.46138 XX</td>
</tr>
<tr>
<td>7</td>
<td>1664</td>
<td>2.50248 X</td>
</tr>
<tr>
<td>6</td>
<td>324</td>
<td>2.55964 XX</td>
</tr>
</tbody>
</table>

*ECO – 1, MS – 2, PS – 3, AFS – 4, LAW – 5, NS – 6, SSH – 7, TSI - 8

**Source: own calculations**

According to table 4, the first group consists of technical sciences, where satisfaction with studies is highest. The second group, which is less satisfied with the field of study consists of economics and management and the third group consists of law, pedagogical and medical sciences. The fourth group consists of the rest of the sciences (AFS, SSH and NS).

4. Conclusion

The career success of graduates is viewed as a direct measure of the quality of higher education (Teichler, 2009). The shift from student to employee status has become an important aspect of the labour market for students and for universities (Butum, 2017). Our results of the survey show good news that most university graduates are satisfied with their study programs, although the proportion of satisfied graduates varies statistically significantly among the fields of study. However, we must not forget the dissatisfied students. It is necessary to look for the causes of their dissatisfaction and take appropriate measures accordingly, e.g. better information of secondary school students when choosing to study at a university, a signal to the university that the given study program must undergo certain changes. The current role of the higher education system involves not only a series of technical skills, but also other competencies, such as communication skills, teamwork skills, project and time management skills, and emotional coordination capacities (Gilar-Corbi, 2019) are usually sought by employers. The universities should provide a complex education, that also focuses on adapting educational offers to the needs of the labour market (Sá, Serpa, 2018) and need to discover
new ways of attracting students and, moreover, prepare them for the current job market and ensure the sustainable development of society (Zartner, 2018).

The article contains the ongoing results of the survey. In the next survey, we will focus on identifying the factors that have the greatest impact on the satisfaction of graduates with their studies. In addition, it would be appropriate to repeat the survey after another seven years (2015-2022) to see if the situation has changed for the better.

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References


