

INSERTION OF LIFE SCIENCES GRADUATES IN THE LABOUR MARKET

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Abstract

Ensuring student-centered training, oriented towards the labor market and carried out in partnership with sustainable development actors ensures a favorable framework for increasing economic competitiveness, adapting production processes to sustainable objectives and increasing the resistance of the economic environment to economic, social and geopolitical vulnerability. The purpose of the research consisted in the analysis of the insertion of the graduates of the University of Life Sciences in Iași (USV Iași) on the labor market. For this, a survey was carried out based on a questionnaire administered to graduates after a variable period after their graduation. The data processing was carried out using statistical tools agreed for the researched topic, including the TwoStep Cluster analysis. The results reveal an insertion of graduates of 66.31%, percentage represented by 36.76% employees and 29.55% entrepreneurs, with small differences between women (50.2%) and men (49.8%). Conversely, women preferred studies (19.1%) and employment and men entrepreneurship (48.8%). Graduates of bachelor studies declared an employment of 22.6%, 6.5% continue their studies. Among the employed respondents, 41.6% started a business or got hired in less than 3 months in the field of completed studies (49.7%). Graduates of master's studies declared themselves employed in percentage of 81.3%, of which 40.2% are employees and 32.2% are entrepreneurs. The first form of employment or first entrepreneurial activity was during studies for 28.8% and less than 3 months after finishing studies for 28.0%. Graduates of doctoral studies were registered with the professional status of being employed for 38.7% of the respondents, of which 22.6% are employees, 9.7% are entrepreneurs and 9.7% are continuing their studies. The results recommend: the dynamic analysis of the insertion of graduates on the labor market and their career path; analysis and correlation of educational plans and developed skills in accordance with labor market demand; strengthening partnerships between USV Iași and public and private economic organizations.

Key words: graduates insertion, higher education, skills, competitiveness, agriculture, food, veterinary medicine

School-to-work transition and labour market integration of young people represent a very important problem of modern societies. Innovative potential of young people is a real factor of progress in modern economies and societies. Also, their lack of experience, the new behaviours and attitudes can be a serious obstacle to labour market insertion of young people (Angelescu C. *et al*, 2010)

Growing numbers of higher education graduates and persistent demand for further education from the population leads to concerns about mismatch between jobs requirements and workforce qualifications, both regarding overqualification and also sometimes regarding underqualification. There seems to be conflict in public policies that while numbers of enrolled students at universities and consequently numbers of graduates are rising, there could be a shortage of

graduate level jobs in the future. (Urbanek V., 2012)

The primary role of higher education institutions is to provide an educational system that meets the requirements of the labour market so as to be consistent with the requirements of career for young graduates. Therefore, it is important to know how well the university can respond to these demands, expectations. (Eniko S. *et al*, 2014)

The fact that the Romanian society has recorded a significant economic downturn is also revealed by the conclusions of several studies: the decrease in number of students integrated on the labour market after graduation and an increasingly higher number of graduates working in the field they graduated. (Elena R.N. *et al*, 2011)

Transformations in the labour market entail changes in forms of employment, which is a subject

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area in which graduates should get some degree of orientation. Currently a multiplicity of forms of employment is developed, which may be useful in the creation of their own lives. (Hurlo, 2016)

Significant expansions in higher education over the last few decades have raised concerns about an over-supply of graduates in the labour market, such that a degree no longer seamlessly translates into a graduate career or occupation, with the increased life chances this could bring. (Burke et al, 2020)

The improvement of the food engineering graduates insertion on labour market is an important target even during the educational training. Specific studies provide the four complementary levels followed in steps of the development reach: level 1 - connections with top food companies on industry processes (dairy, cereals, meat, additives, starch); level 2 - development of a systematically training and increment of the business customer faith; level 3 - food engineering's graduates employment; level 4 - development of necessary projects to social and economic adjustments to communion acquits. (Neli et al, 2012)

Academic skills have that effect when excess supply in the overall labour market is higher. Field-specific skills also protect graduates against the risk of unemployment, whereas graduates' level of academic skills appears to be unrelated to the risk of becoming unemployed. (Humburg, 2017)

Over the past decades a continuous trend of expansion has led to the emergence of massified higher education systems that have tried to accommodate a growing diversity of students and demands through diverse institutional profiles and program supply. Recent studies have also pointed out to a growing diversity in the transitions and integration of those expanded cohorts of graduates in the labour market. Hence, it is relevant to assess to what extent the growing institutional and programme diversification may be associated with different profiles of graduates and the multidimensional set of acquired competencies throughout higher education. (Teixeira et al, 2016).

The labour market represents one of the most important things that affect the life of people, in the modern and contemporaneous societies. From the beginning of their preparation, at the very earlier age, our children learn that they will have to have a good job because only in this way they can have a good life. There is a spread question put to children from three years old: "What do you want to be when you will grow up?". Practically this is the first moment when we contact the first representation of the labour market. The children don't have any clue

about their own competences, they know nothing about what labour market want at that moment, the representation about guilds and jobs is very vague or even absent. From this moment labour market will be increasingly present in our concerns and at a time it became almost the most important thing in our life. (Darabaneanu, 2014)

The assumption that greater education levels of a given population leads to better employability levels thanks to higher education institutions (HEI) is widely known. However, most of the research related to HEI is focused on the determination of efficiency levels from an eminently academic perspective. (Blanco et al, 2022)

The main objective of the research presented in this article was to determine the insertion analysis of the graduates of the Iași University of Life Sciences (USV Iași) on the labor market.

"Ion Ionescu de la Brad" University of Life Sciences in Iasi specializes in agronomic and veterinary medical higher education, with the mission of training engineers specialized in agronomy, horticulture, animal husbandry, engineering and management in agriculture and rural development, environmental engineering, food products engineering, agricultural biotechnologies, graduates in agricultural biology and veterinary doctors. Within USV Iași, the following forms of studies are carried out: undergraduate studies; Masters; doctoral school; postdoctoral school; continuous training and teaching staff training (<https://iuls.ro>).

MATERIAL AND METHOD

This objective led to the development of a questionnaire survey administered to graduates after a variable period after their graduation. They completed the questionnaire when they returned to the university to receive their graduation diploma. The data processing was carried out using statistical tools agreed for the researched topic, including the TwoStep Cluster analysis. In the survey questionnaire, the online questionnaire was chosen based on objectives such as the status of graduates on the labor market, the duration until they become labour engaged through employment or through entrepreneurial activities and the reason why their employment is delayed, if the case. The form of the questions corresponded to the specific objectives of the questionnaire, including fill-in-item questions, select-item questions and multiple-item questions (Table 1).

The questionnaires were stored in the university's cloud database and for developing this paper 9 questions were selected that were considered most relevant. Access to the questionnaire is restricted and data processing and

analysis have been carried out in compliance with the personal data regime - GDPR. In general, the questions included pre-set answer options, but

most also allowed filling in with the respondents own answers.

Table 1

Questionnaire for graduates

No.	Objective	Type	Answer variants / content
1	The year of completing the questionnaire	completion items	text (years)
2	Last completed studies	select items	bachelor's, master's, doctorate
3	The gender of the respondents	select items	woman, man
4	Year of graduation	completion items	text (years)
5	Duration since graduation	completion items	text (years)
6	Professional status	multiple items	employee, entrepreneur, unemployed
7	Form of employment (employee / entrepreneur / studies)	select items	employee, entrepreneur, studies
8	Duration until employment (occupation)	completion items	text (years)
9	The position in the graduated field	select items	Yes, No

The questionnaire was completed by 3,253 subjects between April 2017 and September 2022. After the database review, 3,234 responses remained.

The creation of databases, data validation and their analysis required the use of Microsoft Office and IBM SPSS Statistics 23 applications. The validation of the questionnaire results was carried out with Exploratory Factor Analysis (EFA) from the SPSS application for the possibility it offers to determine the covariation from a set of measured variables, to identify the common factors that establish the structure and order among the variables. (Tucker L., MacCallum R.C., 1997).

Data analysis was also carried out with the TwoStep Cluster Analysis function from the SPSS application because it allows the creation of natural clusters from a data set that would otherwise not be evident in any other way. This clustering uses both

categorical and continuous variables, involves selecting the number of clusters, and uses a probability distance measure that assumes that the variables in the modeled cluster are independent (Bacher J., 2000).

RESULTS AND DISCUSSIONS

Questionnaires were filled in between 2017-2022 with the highest incidence in 2021 (33.2%), followed by 2020 (27.1%) and 2022 (21.5%), the latter being a year with partial registrations until September. At the level of the entire research, the employment level of graduates on the labor market was 71.1%, of which 36.76% were employees, 29.55% entrepreneurs and graduates continuing their studies - 33.69%.

Table 1

Answers to the graduate questionnaire

No.	Objective	Answers
1	the year of completing the questionnaire	2017 - 3.6%, 2018 - 7.8%, 2019 - 6.7%, 2020 - 27.1%, 2021 - 33.2%, 2022 - 21.5%
2	last completed studies	Bachelor's - 75.1%, master's - 23.0%, doctorate - 1.9%
3	the gender of the respondent	woman - 55.8%, man - 43.6%
4	year of graduation	until 1990 - 0.3%, 1991-2000 - 0.3%, 2001-2010 - 2.9%, 2011-2020 - 82.4%, after 2021 - 13.6%
5	duration since graduation	At most 5 years - 76.6%, 6-10 years - 5.6%, more than 10 years - 17.2%
6	professional status	In the labour market - 71.1%, not in the labour market - 28.2%
7	form of occupation	Employee - 26.2%, entrepreneur - 21.0%, still studying - 24.0%, none of the above - 28.2%
8	duration until employment (occupation)	Employed during studies - 18.4%, less than three months - 26.3%, between 3 and 6 months - 11.7%, between 6 and 12 months - 6.1%, more than 12 months - 3.5%, did not specify - 33.9%
9	the position in the graduated field	yes - 33.8%, no - 22.7%, yes, no - 0.2%, did not specify - 43.4%

The primary statistical analysis of the questionnaires indicates a similar level of employment of women (50.2%) and men (49.8%)

but 19.1% of women continued their studies compared to 15.1% of men who continued their studies. Women were employed at a rate of 45.6%

compared to men who were employed at a rate of 36.2%. Men preferred entrepreneurial activities (48.8%) compared to women (35.3%).

The orientation of USV Iași graduates towards entrepreneurial activities is justified both by the engineering profile of the university (<https://iuls.ro>) but also by the non-refundable funding opportunities addressed to young people (Wasserman D. *et al*, 2010; Coopmans I. *et al*, 2021).

On the other hand, the respondents who answered that they are entrepreneurs, it is possible that a part of them answered the previous question that they are not busy because they carry out entrepreneurial activities and are not employed. It is also possible that some of the graduates engaged in unregistered entrepreneurial activities use their working time to a small extent with these activities.

To the question about the duration until employment (occupation) they did not specify - 33.9% of which are the 28.2% who are not employed and the difference being represented by respondents who did not have a clear opinion about this aspect.

When they were asked if they work in the job field, some respondents (0.2%) answered "yes, no" and others did not specify - 43.4%. Among the latter are the unemployed, but 15.2% of the total respondents cannot clearly state the correlation of their studies with the field in which they work. This phenomenon is due to the fact that they work in specific branches or related to the graduated field. We note, however, that 47.17% of employed graduates consider themselves employed in the field in which they completed their studies.

This problem is particularly important for any educational institution and especially for those in tertiary education because technical progress, globalization, increased economic competitiveness, geopolitical and environmental challenges, determine the emergence of new positions with multiple and interdisciplinary valences. Traditional trades are also adapting to the current context. Thus, graduates will answer this question with even greater difficulty. It is obvious that they will not be able to appreciate precisely which of the general or specialized skills allow the accomplishment of the tasks at the current workplace.

However, with the progress in study cycles and specialization, it is obvious that the graduates belong to the field they studied. This statement justifies the growing share of positive answers (regarding employment in the field studied) from the bachelor's degree (29.4% of the total bachelor's graduates), to the master's degree (46.2% of the

total master's graduates) and up to the doctorate (59.7% of the total doctors).

The statistical analysis by education cycle shows that graduates of undergraduate studies completed the questionnaires in the years: 2017 - 3.4%, 2018 - 8.1%, 2019 - 6.5%, 2020 - 27.6%, 2021 - 33.8%, 2022 - 20.6%. The gender of the respondents was represented by women - 56.1%, men - 43.9%. They completed their undergraduate studies in the years: 2001-2010 - 0.3%, 2011-2020 - 46.4%, after 2021 - 53.2%. The duration since their graduation was: up to 5 years - 54.7%, 6-10 years - 1.3%, over 10 years, 44.1%. Professional status employed - 29.0%, not employed - 71.0%. The form in which graduates are employed is represented by: employee - 11.9%, entrepreneur - 10.7%, unemployed - 71.0%, continuing studies - 6.5%. They declare that the duration until employment was: employee from the faculty - 18.7%, less than 3 months - 41.6%, between 3 and 6 months - 25.3%, between 6 and 12 months - 10.4%, more than 12 months - 4.1%. Regarding the field of employment according to the field of completed studies, the graduates believe that: yes - 49.7%, no - 40.0%, yes, no - 0.1%, they did not specify - 10.1%.

Graduates of master's studies completed the questionnaires in the years: 2017 - 4.1%, 2018 - 6.6%, 2019 - 7.7%, 2020 - 25.8%, 2021 - 31.8%, 2022 - 24.0%. The gender of the respondents was represented by Female - 55.6%, Male - 44.4%. They completed their undergraduate studies in the years: before 1990 - 1.0%, 1991-2000 - 1.4%, 2001-2010 - 8.6%, 2011-2020 - 87.2%, after 2021 - 1.8%. The duration since their graduation was: up to 5 years - 74.9%, 6-10 years - 16.3%, over 10 years - 8.8%. Professional status: employed - 81.3% and unemployed - 18.7%. The form in which graduates are employed is represented by: employee - 40.2%, entrepreneur - 32.2%, unemployed - 18.7%, continuing studies - 13.3%. They declare that the duration until employment was: employee from the faculty - 28.8%, less than 3 months - 28.0%, between 3 and 6 months - 12.3%, between 6 and 12 months - 8.1%, more than 12 months - 4.1%. Regarding the field of employment according to the field of completed studies, the graduates believe that: yes - 56.8%, no - 35.2%, yes, no - 0.5%, they did not specify - 7.4%.

Graduates of doctoral studies completed the questionnaires in the years: 2017 - 9.7%, 2018 - 9.7%, 2019 - 4.8%, 2020 - 24.2%, 2021 - 27.4%, 2022 - 24.2%. The gender of the respondents was represented by women - 61.3%, men - 38.7%. They completed their undergraduate studies in the years: before 1990 - 1.6%, 1991-2000 - 0.0%, 2001-2010

- 6.5%, 2011-2020 - 48.4%, after 2021 - 43.5%. The duration since their graduation was: up to 5 years - 33.9%, 6-10 years - 32.3%, over 10 years - 33.9%. professional status: employed - 38.7%, unemployed - 61.3%. The form in which graduates are employed is represented by: Employed - 22.6%, entrepreneur - 9.7%, unemployed - 61.3%, continuing studies - 9.7%. They declare that the duration until employment was: employee from the faculty - 8.3%, less than 3 months - 4.2%, between 3 and 6 months - 0.0%, between 6 and 12 months - 4.2%, more than 12 months - 0.0%, they did not specify - 83.3%. Regarding the field of employment depending on the field of completed studies, the graduates believe that: yes - 16.7%, no - 8.3%, they did not specify - 75.0%.

Analiza TwoStep Cluster, realizată pentru toți parametrii din chestionar (fig. 1), a permis gruparea respondenților în două grupuri (clustere) după predictorii: ocuparea, durata până la ocupare, forma de ocupare și ocuparea în domeniul de studii.

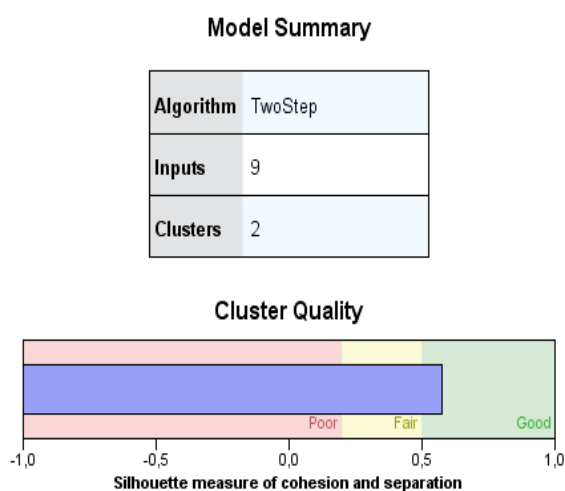


Figure 1 Clustering of graduates

Cluster 1 includes employed graduates with a frequency (ff.) of 99.9%, who completed bachelor's studies (ff. 69.4%), are employed or have businesses in the field in which they graduated (ff. 52.6%), are women (ff. 50.2%), carry out entrepreneurial activities (ff. 42.1%) and have engaged or started businesses in less than 3 months (ff. 36.7%).

Cluster 2 consists of graduates who are not employed (ff. 100.0%), are graduates of undergraduate studies (ff. 86.7%) and are mostly women. These results indicate a higher level of employment of men in entrepreneurial activities but do not provide sufficient information about the level of employment of women as employees or entrepreneurs.

Limitations of the present research consisted in the fact that subjects were asked

retrospectively about their employment conditions. It is likely that some of them could not provide accurate information about the time until employment. Future research could involve an optimization of the moment of administration of the questionnaires, the structuring of the questions according to the objectives and the clearer delimitation of the field of studies as a future field of activity.

CONCLUSIONS

The employment level of graduates on the labor market was 66.31%, percentage represented by 36.76% employees and 29.55% entrepreneurs. A similar level of employment was recorded for women (50.2%) and men (49.8%), but women preferred studies (19.1%) and employment and men entrepreneurship (48.8%).

Graduates of professional bachelor studies declared an employment of 22.6%, 6.5% continue their studies. Among the employed respondents, 41.6% started a business or got hired in less than 3 months in the field of completed studies (49.7%).

Graduates of master's studies declared themselves employed in percentage of 81.3%, of which 40.2% are employees and 32.2% are entrepreneurs. The first form of employment or first entrepreneurial activity was during studies for 28.8% and less than 3 months after finishing studies for 28.0%.

Graduates of doctoral studies were registered with the professional status of occupied for 38.7% of the respondents, of which 22.6% are employees, 9.7% are entrepreneurs and 9.7% are continuing their studies.

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The main objectives of the project were: 1. Research on the insertion on the labor market and the professional course of graduates and the skills obtained in the university; 2. Analysis of the correlation between the educational plans and the skills obtained by the graduates with the requirements of the labor market; 3. Identifying the means of adapting the educational offer to the requirements of the labor market by holding 4 meetings between students, teaching staff and representatives of the 4 faculties; 4. Correlation of educational plans and the skills obtained by graduates with the requirements of the labor market by adapting the curriculum.

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