

## RESHAPING EDUCATION WITHIN THE UNIVERSITY OF PETROȘANI UNDER THE INFLUENCES OF THE LABOR MARKET

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**Abstract:** Our paper reviews transformations underwent by the University of Petroșani – a comprehensive academic institution from Hunedoara County – in its attempt to adjust its educational internal configuration to unprecedented changes occurred in the labor market. The paper is organized as follows. Section one focuses on the main demographic trends with a significant impact on the labor market dynamics in Romania. Section two explores metamorphosis made, over the time, by the management of the University of Petroșani in order to meet new challenges on the labor market. Section three takes a closer look on the involvement of the University of Petroșani in POSDRU European projects, with the specific aim of facilitating graduates' integration on the labor market. Finally, section four concludes.

**Key words:** labor market, higher education, University of Petroșani, study programs, life-long learning, POSDRU European projects

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### Introduction

The University of Petroșani currently represents a remarkable cultural and social institution in Hunedoara County, a comprehensive higher education institution, with a significant academic and scientific role in the region, as well as an intellectual pillar which has the potency of preserving the Jiu Valley among the vital academic towns in Romania.

Since its foundation in 1948, the University of Petroșani has had the mission to train graduate specialists for all the fields of activity specific for the mining industry, as well as for other industrial branches: mining machines and installations, technological equipment, energy and process automation. In Petroșani have graduated those specialists who worked especially in Romanian mining industry, but also in about 20 countries in Asia, Africa, South America, North America and Europe.

Social and economic changes occurred after 1990 brought about major changes within the higher school in Petroșani and, consequently, technical education continues alongside with the emergence of new study programs in the field of economy, mathematics, socio – humanistic, IT and public administration (Dura and Isac, 2014). Throughout the time, the demographic challenges also added new

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features to the familiar constraints on higher education (Klemencic and Fried, 2007, Popescu et al., 2015). Therefore, the University of Petroșani underwent a radical transformation process by adjusting its study programs and organizational structures and becoming more open and flexible through using social media (Smolağ et al, 2016), in order to meet the needs of an increasingly heterogeneous student population, which can encompass, among other categories, lifelong learners and foreign students .

### **Demographic Trends with Significant Impact on the Labor Market Dynamics in Romania**

Demography plays a crucial role in the process of designing education policies at the European level. Between the main factors that nowadays influence education forecasts we can mention the following: population growth rates, natality rates, the number of school-age population, migratory flows, geographical dispersion of population etc. Taking into consideration the main demographic challenges that affect the future of higher education in Europe and Romania, we believe that the pool of domestic students aged between 18 and 25 years will follow a fast-paced diminishing trend, while academic institutions will intensify the struggle to attract young population to the system (Mizikaci and Baumgartl, 2007).

Recent predictions regarding the expected evolution of population in EU countries show an unprecedented demographic shift: trends on birthrates migration and mobility will join together resulting in an accelerated decrease of youth population over the next 50 years.

Having in mind the fact that European universities traditionally train people aged between 18-25 years, it begins self-evident that the functionality of these academic institutions will be seriously perturbed by the shrinking of their conventional target group in the long run. Romania is acknowledged between the countries whose higher education system will have to face a high risk of closure or set back by 2050, due to a significant decline in population, accompanied by low natality percentages and negative migration rates (Baumgartl et al., 2007).

Statistics published by Eurostat during the last period are extremely eloquent about the present and future situation of the young population in our country. If in 2012, in Romania there lived over 6 million young people aged between 15 and 34 years of age, i.e. 25.1% of the total population (above the EU- 27 average), forecasts for 2015 reflect a reduction of this indicator below the EU-27 average, followed by a rapid decrease in the share of young people in the total population by the year 2060 (The Romanian Government, 2015).

If the ILO (International Labor Organization) unemployment rate at the level of the population was only 7% in 2012, the incidence of this phenomenon was higher among young people under the age of 25: 22.7%. For the age group 25-34 years, the unemployment rate was also higher as compared to the percentage calculated at the level of the entire working population: 8.6%. A special mention should be made in this context in relation to the situation in Romania: while graduating from

a university is likely to increase the chances of young people to join the labor market in other European countries, this fact is denied by statistical data available in our country (Niță, 2013).

Thus, ILO unemployment among people who have completed secondary level education and/or post-secondary studies was of 10.3% in 2012 and 10.9% among graduates of higher education. *The inclusion of higher education graduates on the labor market is rather difficult in Romania, the main reason being that employers are in search of experienced personnel* (The Romanian Government, 2015).

As regards *the correlation between the education system and the labor market*, a survey conducted by the European Commission in 2013 (Commission Staff Working Document, 2013) shows that *in Romania there is an adequate vertical harmonization*, reflected by the low proportion of overqualified or under-qualified employees in comparison with the requirements of the job (as compared to other European countries); however, there can be found *the weakest correlation at horizontal level*, due to the high percentage of graduates employed in fields of activity other than their specialization. Moreover, these conclusions must generate a series of reflections at the level of decision-makers, determining the urgent development and implementation of national policies designed to restructure the entire educational system.

Nevertheless, the above mentioned demographic trends not only affect the dynamic of young population, but predict a significant change in the structure of the society that involves an extension of active life sustained by the rising average life expectancy. Consequently, societal needs will configure or improve the study programs and/or vocational training which addresses health and elderly issues (Korka, 2009; Grabara 2013). Increasingly, people beyond the traditional 18-25 range of ages will be enrolled in academic institutions, as a factual prove that the life-long-learning concept begins to take roots in Romania, as well as all over the Europe.

Starting from this general background, the following section will focus on the restructuring actions carried out by the University of Petroșani, in its attempt to both cope with the effects of global demographic trends and adjust to the evolution of the labor market in Romania.

These transformations followed three main directions aiming at the reorganization of activities in the educational area: a) *the diversification of Bachelor/Master's Degree study programs* with the possibility to enroll foreign students; b) *the expansion of post-graduate courses* in order to attract other categories of students in addition to the traditional 18 to 24 year-age cohort; c) *mobilization of alternative financial resources* with the specific aim of increasing young graduates' insertion on the labor market.

### **Education System within the University of Petroșani under the Influences of the Labor Market**

The strategy of developing the curricula of the University of Petroșani has started

from the need to establish solid connections among the three levels of the Bologna educational system: Bachelor – Master studies – Doctorate studies; at the same time, the competence given by each component has been structured based on the demands of the local labor market.

Highly skilled academic staff has been formed at the same time, which provided part of the teachers who started after 1990 the development of new technical branches, but mostly paved the way for specializations in economics, administration, real and social sciences. As a result, the educational offer expanded every year, both for graduate and master studies, so that in the academic year 2015-2016 the University provides, in bachelor studies, 25 academic programs (specializations), of which 20 are accredited within 19 fields of study (*Internal Report...*, 2015).

The evolution was constantly ascending, so that:

a. The *Faculty of Mining Engineering* started in 1990 in the field of Mining, with four specializations: *Underground mining*; *Mining Surveying*; *Coal and ore processing*; *Surface mining (Opencast mining)*. At present, the education of future engineers is ensured in day courses, five fields and eight specializations (Table 1).

**Table 1. Academic specializations within the Faculty of Mining Engineering**

No.	Academic field	Academic program (specialization)	Studies Duration	Form of study
1.	Mining, oil and gases	Mining engineering	4 years	Day courses
		Mining surveying	4 years	Day courses
2.	Civil engineering	Mining constructions	4 years	Day courses
3.	Environmental engineering	Environmental engineering and protection in industry	4 years	Day courses
		Waste recycling engineering	4 years	Day courses
4.	Engineering and management	Economic engineering in the field of constructions	4 years	Day courses
		Economic engineering in the field mechanics	4 years	Day courses
5.	Industrial engineering	Quality engineering and management	4 years	Day courses
		Safety engineering in industry	4 years	Day courses

b. The *Faculty of Mechanical and Electrical Engineering* educated in 1990 engineers in the field of mechanics and assistant engineers in the field of electromechanics. Nowadays, the Faculty trains engineers in seven fields and nine specializations (Table 2).

**Table 2. Academic specializations within the Faculty of Mechanical and Electrical Engineering**

No	Academic field	Academic program (specialization)	Studies Duration	Form of study
1.	Electrical engineering	Electromechanics	4 years	Day courses

		Instrumentation and data acquisition	4 years	Day courses
2.	Computers and information technology	Computer engineering	4 years	Day courses
3.	Power engineering	Industrial energetics	4 years	Day courses
4.	Mechanical engineering	Mining machines and equipment	4 years	Day courses
		Industrial processing equipment	4 years	Day courses
5.	Systems engineering	Automation and applied informatics	4 years	Day courses
6.	Transports engineering	Transports engineering and traffic	4 years	Day courses
7.	Industrial engineering	Machine building technology	4 years	Day courses

c. The Faculty of Sciences was initiated with academic year 1990-1991, when the foundations of higher education in a new field are laid, by setting up the specialization *Industrial Management*. The Faculty of Sciences is preparing at the present economists, sociologists, social workers, graduates in public administration and mathematics, within eight study programs from eight academic fields at day courses, and three study programs at distance learning (Table 3).

**Table 3. Academic specializations within the Faculty of Sciences**

No.	Academic field	Academic program (specialization)	Studies Duration	Form of study
1.	Finances	Finances and banks	3 years	Day courses/ Distance learning
2.	Accounting	Accounting and management information systems	3 years	Day courses/ Distance learning
3.	Management	Management	3 years	Day courses/ Distance learning
4.	Business Management	Economy of commerce, tourism and services	3 years	Day courses
5.	Administrative Sciences	Public administration	3 years	Day courses
6.	Social Assistance	Social assistance	3 years	Day courses
7.	Sociology	Sociology	3 years	Day courses
8.	Mathematics	Mathematics	3 years	Day courses
9.	Information tech.	Information technology	3 years	Day courses

Meanwhile, the offer of master's Degree studies has constantly diversified, so that in academic year 2015-2016 there are 19 ARACIS accredited academic programs in 13 fields (Table 4).

Table 4. Master specializations within the University of Petroșani

Faculty	Academic field	Master's Degree program	Studies Duration	Form of study
MINING ENGINEERING	Mines, oil and gases	Computer-based mining survey and cadastre	2 years	Day courses
		Occupational health and safety management	2 years	Day courses
	Civil engineering and installations	Mining constructions design engineering	1,5 years	Day courses
	Engineering and management	Project engineering and management	2 years	Day courses
	Environmental engineering	Anthropogenic environmental impact assessment and ecological restoration	2 years	Day courses
		Environmental factors control and monitoring	2 years	Day courses
MECHANICAL AND ELECTRICAL ENGINEERING	Electrical engineering, electronics and telecommunications	Electrical and mechanical systems	2 years	Day courses
		Industrial electrical equipments operation	2 years	Day courses
	Mechanical engineering	Processing installations and equipments	2 years	Day courses
		Processing installations and equipments in mining	2 years	Day courses
	Systems engineering	Information systems and technologies	2 years	Day courses
		Applied information techniques and technologies	2 years	Day courses
SCIENCES	Management	Strategic business management	2 years	Day courses
		Human resources management	2 years	Day courses
	Finances	Financial and banking management	2 years	Day courses
	Accounting	Accounting and auditing	2 years	Day courses
		Management information systems	2 years	Day courses
	Sociology	Social policies and social protection	2 years	Day courses
Mathematics	Didactic mathematics	2 years	Day courses	

The content of the studies programs is permanently renewed by including new items of knowledge resulting from scientific research. Relevant examples of new study programs associated with research trends in the university are the following: *Industrial Safety Engineering* (Bachelor study program established in academic year 2012-2013); *Accounting and Audit* (Master study program established in academic year 2012-2013). For the immediate future, the Faculty of Mining Engineering will be engaged in the process of preparing the documentation

and logistics required in order to set up a new Bachelor study program in the field of Mining Engineering taught in English – a solution of turning to advantage the expertise and knowledge acquired in the field by our teaching and research staff. Further training by doctoral studies represents the third advanced academic cycle. The University of Petroșani is validated as an organizer of doctoral studies and ensures, through the Doctoral School, doctoral studies in the field of Engineering Sciences, with the following specializations: a) *Mines, oil and gases*; b) *Industrial Engineerig*; c) *Electrical Engineering*; d) *Systems Engineering*. This activity is coordinated by 16 advisors, high academic tenure professors from the Faculty of Mining Engineering and the Faculty of Mechanical and Electrical Engineering. Given the restriction in area selection of future students, from reasons related primarily to the demographic decline that brought about a dramatic decrease in the number of high school graduates, the University of Petrosani has enrolled in the academic year 2014-2015, 3.398 Bachelor, master and PhD students (Table 5).

**Table 5. Dynamics of the number of Bachelor, Master and Doctorate students**

Academic year	Bachelor students		Master students		Total number of Bachelor and Master students			Doctoral students
	Fee exempt	Fee paying	Fee exempt	Fee paying	Fee exempt	Fee paying	Total	
2009-2010	2191	2654	547	1181	2738	3835	6573	260
2010-2011	2253	1871	667	784	2920	2655	5575	188
2011-2012	2313	1026	436	637	2749	1663	4412	136
2012-2013	2241	752	255	650	2496	1402	3898	128
2013-2014	2132	447	377	453	2509	900	3409	143
2014-2105	2058	427	438	368	2496	795	3291	107

It should be pointed out that, of the total number of students in academic year 2014-2015, 255 master and doctoral students are coming from the Republic of Moldova, on scholarships granted by the Romanian state.

The academic curriculum was considerably enriched during the past few years with post-graduate courses complementing Bachelor and Master's Degrees specializations:

- Post-graduate courses for continuous professional training and development, which are meant to add new competences to those acquired by the student during the Bachelor and master studies;
- Post-graduate courses for professional conversion, which are designed especially to pre-academic teaching staff who want to expand their teaching areas with subjects in the curriculum of these programs.

These courses offer a wide range of opportunities for adults, regardless of their age, to upgrade their skills and qualifications in line with present-day theoretical and practical developments.



### **Involvement in European Projects – an Alternative Mechanism of Students' Adjustment to the Dynamics of Labor Market**

The expansion and diversification of learning tools as well as the formation of abilities and competences meant to increase the chances of employment and to facilitate the rapid adjustment of graduates to the requirements of their future work place, represent priorities of POSDRU European projects. In order to respond to the new concrete requirements of the labor market, the University Petrosani has been involved several European projects, each of these having an effective educational component:

**1) POSDRU 82/5.1/S/59756 – "Alternative Professional Training by Using Information Technology – a Solution for the Reconversion of Mining Workforce"** (2010-2013). The general objective of the project was to increase of employment rate by attracting the young and long term unemployed on the labor market on grounds of developing modern and innovative methods for the implementation of active employment measures. On the long run, the project regarded to generate approaches and methods for the harmonization between the work force supply and demand.

The goal of the project was achieved by providing 8 professional training programs for the initiation or specialization of 600 unemployed, 400 of which being aged between 15-24 years, and of 200 long term unemployed, all being inactive or in search for a job. The target group was instructed by the instrumentality of modern learning tools, which took the shape of an e-Learning collaborative training portal.

**2) POSDRU 87/1.3/S/64273 - "The Development of Human Resources in Higher Education for Using the e – Learning System"** (2010-2013). The general objective of this project was to develop and to modernize the continuous training system in higher education, by means of implementing an e-Learning system at the University of Petroșani and the setting up of a common data basis, in collaboration with the University "Oil and Gases" of Ploiești ([www.upet.ro](http://www.upet.ro)). The outcomes of the project can be summarized as follows: 240 members of the teaching staff assimilated knowledge required for the use of e-Learning as a modern teaching – learning method; 50% of the certified teaching staff populated the data basis of the system with their courses; the University of Petroșani was equipped with a highly advanced e-Learning system (including both hardware and software components); 5 amphitheatres were endowed with didactic logistics and Internet/Intranet networks; reference materials regarding the design of e-Learning didactic resources were drawn up and donated to the University of Petroșani Library: *Best Practices Guides*; *Lectora User Guides*; *E-learning Theory*; *The Development of a Curricular System through the Integration of Entrepreneurial Education within e-Learning Technologies* etc. The e-Learning system was uploaded with teaching materials necessary for the modern, ever changing education of Bachelor students and graduates which pursue a master program or a post – graduate course while already working in different fields of economy (life – long learners).



**3) POSDRU/161/2.1/G/141118 - "Practice is not ephemeral, it is a career step!"** (2014-2015). The University of Petroșani is a main partner in the project mentioned above, alongside the West University of Timișoara and the Association of IT&C Students and Specialists. The project is aimed at *correlating and verifying theoretical knowledge gained by students during practical work according to the program*, as well as *counseling and vocational guidance* by developing personal skills relevant to the labor market.

Creating a competitive advantage in the process of employment of young graduates is based on the following activities: promoting and developing partnerships between the university and the business environment, ensuring the connection and feedback between the academic curricula and the academic training on the one hand, and the dynamics of the current requirements of labor market, on the other hand; assisting students in developing a realistic diagnosis on individual skills and capacities; harmonization of abilities and skills of students with personal aspirations and interests (development of a career plan); the development of communication, social and relational skills and abilities, as well as entrepreneurial competences; promoting personal development by participating in soft skills training courses, sessions for CVs preparing, letters of intent; participation in job fairs; carrying out internships in companies and other relevant European institutions etc ([www.carierait.uvt.ro](http://www.carierait.uvt.ro)).

**4) POSDRU/161/2.1/G/156053 - "Students anchored in reality!"** (2015). The project aims at providing an integrated package of guidance, counselling and internships for 150 students of the University of Petroșani attending Bachelor study programmes. The project meets the need of students to gain experience and to acquire the knowledge and skills necessary in finding a job in their field, by improving access to a modern, flexible and inclusive labor market. Practical training internships simulate the conditions of a real workplace, giving students the opportunity to face job requirements with responsibilities and the benefits that may result from it; the chance to put into practice theoretical knowledge assimilated during the academic study program; the development of specific skills for the job (computer, communication, and teamwork), gaining experience and practical knowledge etc.

**5) POSDRU/187/1.5/S/155605 - "Scientific excellence, knowledge and innovation through doctoral programs in main areas"** (2015). The project is implemented by the University of Petroșani, in partnership with the *University of Medicine and Pharmacy "Carol Davila"* from Bucharest, and with the *National Institute of Research and Development for Textile and Leather* from Bucharest. The objectives of the project aim at providing financial assistance for the purposes of training and development of competent human resources in order to carry out scientific research at high standards, capable of a proper insertion on an extremely demanding segment of the labor market – that of highly qualified researchers, working in the fields of top priority sciences.

The target group, made up of 90 PhD students enrolled in the academic year 2014-2015, will benefit from an educational, institutional and financially competitive environment which ensures: the involvement of young doctoral students in interdisciplinary research activities; the development of managerial skills of researchers; enhancing the adaptability of young doctoral students by promoting the exchange of best practices; increasing the attractiveness of the career of researcher etc. (www.upet.ro).

### Conclusions

Having in mind developments in the field of higher education and the corresponding legislation, as well as the main demographic trends foreshadowed in Romania and Europe, the managerial staff within the University of Petroșani has been permanently concerned about the issue of widening adults' participation in higher education, viewed as a feasible option for labor market adjustment (compare Kot, Ślusarczyk 2014, Bumbu, Todorescu, 2012). Among the most important qualitative increases recorded in this respect, over recent years, we highlight the following:

- Improvement of the university curricula through the development of new Bachelor's programs, Master's programs and postgraduate courses, taking into account the requirements of the labor market and of the human resources within the University;
- Laying emphasis on the applied side of the study programmes by concluding partnerships with businesses and institutions and participating in projects aiming at initiating practical internships for students.

The above mentioned developments had as support the attraction of financial resources through the implementation of POSDRU projects that have strengthened the infrastructure dedicated to the teaching processes. By their importance, objectives and results, these projects contribute to the materialization of the life – long learning concept for the mutual benefit of individuals and society.

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### PRZEKSZTAŁCANIE EDUKACJI NA UNIWERSYTECIE PETROSANI POD WPLYWAMI RYNKU PRACY

**Streszczenie:** Artykuł stanowi przegląd przemian, jakie przeszedł Uniwersytet Petroșani – wszechstronna uczelnia z powiatu Hunedoara – w próbie dostosowania jego wewnętrznej struktury edukacyjnej do bezprecedensowych zmian, jakie nastąpiły na rynku pracy. W artykule wyodrębniono cztery sekcje. Sekcja pierwsza skupia się na jednym z głównych trendów demograficznych mających znaczący wpływ na dynamikę rynku pracy w Rumunii. Sekcja druga bada przemiany dokonane przez kierownictwo Uniwersytetu Petroșani w celu sprostania nowym wyzwaniom na rynku pracy. W sekcji trzeciej bliżej przedstawiono udział Uniwersytetu Petroșani w projektach europejskich POSDRU, których celem było ułatwienie integracji absolwentów z rynkiem pracy. W sekcji czwartej podsumowano działania i ich efekty.

**Słowa kluczowe:** rynek pracy, szkolnictwo wyższe, Uniwersytet Petroșani, programy studiów, kształcenie ustawiczne, projekty europejskie POSDRU

### 在勞動市場的影響下，在比利時大學改造教育

**摘要：**我們的文章回顧了Petroșani大學 來自胡內多阿拉縣的一所綜合性學術機構所進行的轉變，試圖將其教育內部配置調整為勞動力市場上出現的前所未有的變化。本文組織如下。第一部分重點介紹羅馬尼亞對勞動力市場動態產生重大影響的主要人口趨勢。第二部分探討了Petroșani大學管理層為了應對勞動力市場的新挑戰而進行的變態。第三部分更詳細地介紹了Petroșani大學在POSDRU歐洲項目中的參與，其具體目的是促進畢業生融入勞動力市場。最後，第四部分總結。

**關鍵詞：**勞動力市場，高等教育，Petroșani大學，學習課程，終身學習，POSDRU歐洲項目