Development of a Competency Model for Selection of Human Resources in the Mining and Quarrying Sector in Bulgaria

Milena Tepavicharova[1] , *Lyudmila* Dikova[1], and *Vitolds* Zahars[2,*]

[1]Higher School of Security and Economics, Plovdiv, 13 Kuklensko Shose Blvd., 4004 Plovdiv, Bulgaria
[2]Daugavpils University, Parades st. 1, Daugavpils, LV-5401, Latvia

Abstract. The sophistication of technology, the globalization and the prolongation of active work age in recent decades require continuous adaptation of the workers' personal skills and professional abilities. This is associated with a number of changes and challenges in the professional development. At present, in the mining industry organizations, the issue of lifelong careers is becoming more and more relevant, requiring a broad set of skills and knowledge. They provide the opportunity for a person to successfully find work, adapt and develop at their workplace, to cope with the professional tasks and to feel satisfaction and receive adequate remuneration for their work. Building a competency model for human resource selection requires targeted actions to improve certain skills and abilities. They represent the common language used by employers and employees, showing the quality of the individual's social and personal orientation in the organizations. The purpose of this article is to identify the set of competencies and on this basis to create a competent model for the management of the human resources selection in the extractive industries in Bulgaria.

1 Introduction

In recent years, the development of professional competencies is increasingly linked to the processes of selection, assessment and career development of the human resources in the extractive industries in Bulgaria.

According to experts [1-4], Formation of competences of the future specialist should assume such an educational environment that is able to provide: combination of applied and fundamental training of future specialists; mastery of professional activity; vocational training and education; the ability to independently see the problem, design knowledge, find a solution to its problem, including a lack of practical skills and information.

The improvement of technology in the field of production requires continuous adaptation of the personal skills and professional competencies of the workers. This is very important in the conditions of increasing innovation of enterprises [5, 6]. This is associated with a list of

* Corresponding author: vitolds.zahars@inbox.lv

changes and challenges in the professional development. At present, in the mining industry organizations, the issue of lifelong careers is becoming more and more relevant, requiring a broad set of skills and knowledge. They provide the opportunity for a person to successfully find work, adapt and develop at their workplace, to cope with the professional tasks and to receive satisfaction and adequate remuneration for their work.

Building a competency model for human resource selection requires targeted action to improve certain skills and abilities. They are the common language used by employers and employees, showing the quality of the individual's social and personal orientation in the organizations. With the evolution of the changes occurring in the mining industry, the requirements for the labor force in them are developed and modified. The introduction of a competence-oriented model requires a refinement of the core competencies that provide for the successful presentation of the specific position. Their development must be tied to the expected results of the specific work activity and company innovativeness [7, 8]. Applying a Competence Model for Human Resources Selection sets standards for organizational behavior and individual development which are sought in work performance based on organizational priorities and strategic goals [9-11].

The purpose of this article is to identify the set of competencies and on this basis to create a competent model for the management of the human resources selection in the mining and quarrying industries in Bulgaria.

2 Materials and Methods

The research covers two target groups - employers and executive staff. Based on the data from the first group, a comparative study is performed and the tendencies for development of the professional competencies in the selection of human resources in the organizations from the mining industry in Bulgaria are presented. The data from the second group make it possible to compare the employers' requirements with the capabilities of the employees in these organizations.

For the analysis of the professional competencies we studied the opinions of 156 owners, managers and specialists in Human Resources Management (HRM) from 17 different in size, status and form of ownership organizations from the mining industry in Bulgaria.

According to size, the organizations surveyed are grouped into three groups, and namely:

- From 1 to 50 employees - 26.89%
- From 51 to 100 employees - 45.90%
- More than 101 employees – 27.21%

When comparing the importance of the acquired knowledge and skills for successful selection and professional realization, the opinions of representatives of the executive staff in the organizations surveyed were also analyzed. For this purpose, 296 employees and workers were interviewed. The classification of the participants by different criteria shows their wide range. (Figure 1).

For the purposes of the study two types of questionnaires were developed - for the employers and the employees. The main research questions focused on obtaining information on:

1. What are the most important competencies for the employers when hiring new employees?
2. To what extent the workers at the firms in the mining and quarrying sector have these skills??
3. Do the graduates of certain degree in mining and quarrying sciences in Bulgaria have the necessary professional competences?

The participants in the study has previously received a list of 20 major groups of professional competence as well as their concise definition and description. (Table 1). They were asked to rank them in a five-point scale, namely: 1 - not important, 2 - somewhat important, 3 - important 4 - very important, 5 - extremely important.

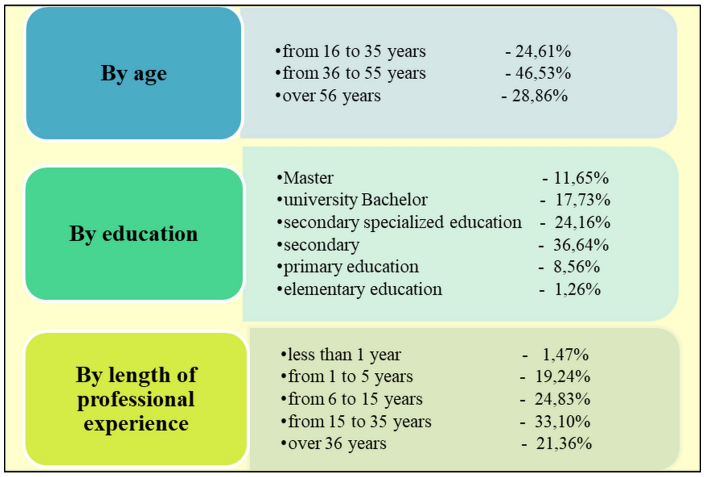

Fig. 1. Classification of the participants in the survey by different criteria.

Table 1. Description of the main groups of professional competence.

No	Competence	Description
1	Adaptability	Ability to adapt to the corporate culture, flexibility, quick orientation to the demands of the changing environment, including the ability to work under pressure and tight deadlines
2	Readiness and willingness to learn	Receptivity, curiosity, desire for self-improvement, seeking and receiving feedback
3	Loyalty	Ethical attitude, honesty, integrity
4	Efficiency	Ability to cope with work tasks with good results
5	Computer skills	Using word processors, spreadsheets, Internet applications
6	Leadership skills	Skills in planning, managing and motivating people, skills in decision-making, negotiation, etc..
7	Mathematical skills	Working with numbers, accuracy, methodical skills, precision
8	Ability to work in a team	Cooperation, conflict resolution, good interpersonal relations, sociability, ability to build relationships
9	Motivation	Positive work attitude, enthusiasm
10	Professional skills	Specific skills and knowledge of the professional field, an adequate idea of the work
11	Communication skills	Clear, convincing and literate expression in oral and written form
12	Critical attitude	Analytical skills, logic, impartiality, accuracy
13	Office skills	Finding and organizing information, documents, data; work habits and use of office equipment
14	Entrepreneurial skills	Initiative, entrepreneurship, business knowledge and insight, determination, ability to make decisions and take risks
15	Self-presentation skills	Skills for successful performance (including in a job application and interview), confidence in one's own skills, positivity, conviction, knowledge of business communication

16	Creativity	Creativity, initiative, ingenuity, lateral thinking
17	Technical skills	Specific skills to use specialized soft ware programs and equipment
18	Client attention skills	Responsiveness, empathy, positive attitude, tact, tolerance, patience, attentiveness
19	Self-management skills	Responsibility, independence, organization of time and work tasks
20	Multilingual abilities	Use (written and spoken) of a foreign language, intercultural experience and knowledge

The actual list has been prepared for the purposes of the study, in which the following were taken into account:
• key competencies formulated by the European Commission [12],
• preliminary analysis of similar studies in Europe and around the world in recent years [13],
• overview of the most frequently mentioned skills and qualities that are required from applicants in job advertisements [14],
• consultations with employers, educational experts and counselors who helped summarizing the skills in 20 groups [15].

The research covers the January - November 2018 period. It is based on data from polls specifically developed for the purpose of the analysis, direct contacts, company documentation, and other. The interview method is used to clarify the data and information. On the basis of the answers received, the possibilities for applying a competent model in the selection of human resources in the mining industry organizations were analyzed and evaluated.

3 Results and discussion

Assessment of the importance of the professional competencies in the selection of human resources in the organizations of the mining and quarrying industry.

The employer survey data show that of all 20 professional competencies suggested, not one is rated as "not important" (Table 2.).

Respondents point out the following ones as particularly important for the professional development of the employees. Vocational training, Teamwork skills, Readiness and Willingness to Learn, Adaptability, Motivation, Efficiency and Self-Management Skills, Communicative Skills. They are rated as "very important" in the selection of new employees with a score of more than 4.

As the least relevant in the selection of human resources, employers in the mining industry consider Technical Skills and Mathematical Skills.

The assessment of the executive staff of the professional competencies which are of particular importance in the selection of human resources in the extractive industries follows very closely that of the employers.

The respondents from both target groups value Vocational Training, Readiness and Willingness to Learn, Team Skills, Adaptability, Efficiency and Motivation as particularly important. The overlapping of the positions leads us to the conclusion that the executive staff in the mining industry has a clear understanding of the professional competencies important for the employers. This can largely contribute to their successful professional realization.

Some discrepancies are observed in the Entrepreneurial and Leadership Skills assessment. Employees value them as important, whereas for employers these professional competencies are not particularly important. For their part, they appreciate higher Communicative Skills and Customer Service Skills.

Table 2. Evaluation of the employers and employees of the importance of the professional competencies in the selection of the human resources in the mining and quarrying industry.

Professional competence	Employers	Executive staff
Professional skills	4.69	4.53
Readiness and willingness to learn	4.48	4.41
Ability to work in a team	4.53	4.40
Adaptability	4.37	4.23
Self-management skills	4.26	3.97
Efficiency	4.02	4.11
Motivation	4.00	4.01
Communication skills	4.13	3.23
Multilingual abilities	3.87	3.96
Self-presentationskills	3.39	3.46
Computerskills	3.58	3.23
Clientattentionskills	3.21	2.69
Loyalty	3.17	3.64
Office skills	3.35	3.56
Creativity	3.09	2.54
Critical attitude	2.83	2.36
Leadership skills	2.75	3.12
Entrepreneurial skills	2.65	3.10
Technical skills	2.47	2.17
Mathematical skills	2.38	2.15
Respondents, number	*156*	*296*

Level of competence of the graduates with a certain academic degree in the selection of human resources in the mining and quarrying industry.

The evaluation of the acquired professional competencies of the graduates with an academic degree in the mining industry represents the level of the competitiveness of the young people and their opportunities for realization on the labor market. (Figure 2 and 3). From the analysis of the respondents' opinions, the following conclusions can be drawn:

• both employers and workers appreciate at the highest extent the Readiness and Willingness to Work, Motivation, Communication Skills, Computer Skills and Creative Skills,

• as professional competencies which are minimally acquired, the employers and employees in the mining industry establish Mathematical Skills, Entrepreneurial Skills, Vocational Knowledge, Efficiency, Leadership, Technical Skills, Critical Thinking and Office Skills. The overlapping positions show that there is a clear idea of the opportunities and gaps in the education system. A good alternative for development and improvement of the insufficiently acquired professional competencies is self-education,

• most of the employers evaluate as relatively good the Foreign language competencies of the graduates of a certain education-qualification degree in the sphere of mining. This assessment is to some extent influenced by the fact that foreign language skills begin to develop from an early age and continue throughout the training period. The workers in the mining industry share the opposite opinion. They define the foreign language skills of the graduates as unsatisfactory. Their point is dictated by the understanding that building foreign language skills and competencies requires active use of the language that the education systems cannot provide at this stage,

• a certain discrepancy in the assessment of the employers and employees interviewed is observed with respect to Adaptability, Teamwork Skills, Customer Skills and Loyalty. According to the employers, these professional competencies are utilized to a much lower degree than the desired level. The employees and workers consider that the graduates of

higher and secondary special education in the extractive industry possess these competencies at a much higher level than demonstrated to the employers. This demonstrates the need for purposeful practical building and upgrading of the significant skills and professional competencies.

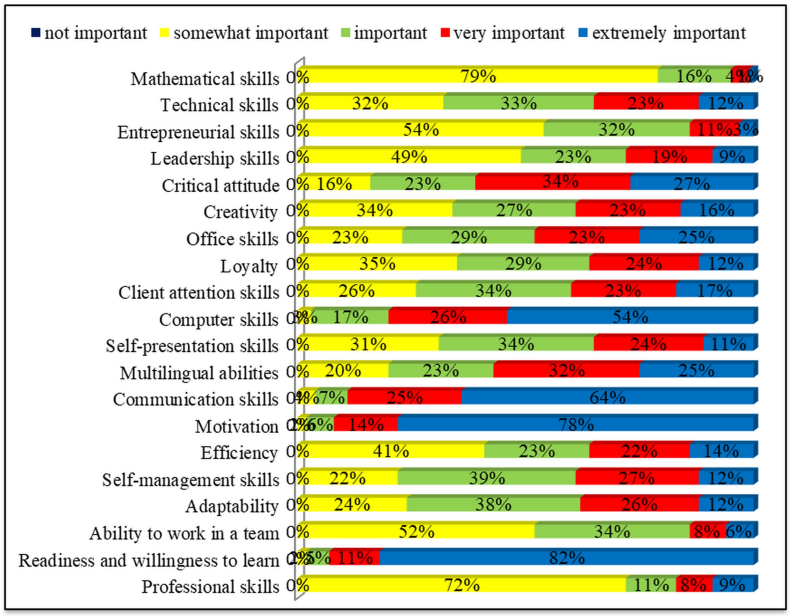

Fig. 2. Degree of acquired professional competencies of degree graduates in the field of the mining and quarrying sciences in the opinion of the employers.

4 Conclusions

The introduction of a competency-oriented model for the selection of human resources requires a sophistication of the core competencies which provide for the successful performance on a particular job position. Their development should be linked to the expected results of the work activity. The professional competencies are not individual skills required to move from the educational to the work stage. They are a fundamental element of the transition from the possibility of being "employed" to the ability to "always find a job". Their development and improvement is of key importance for the successful professional realization of the workers in the mining industry organizations.

An undoubtedly important part of this process is the development of appropriate mechanisms to overcome the inconsistencies between the education system and the requirements for successful professional development of the human potential in the mining and quarrying organizations.

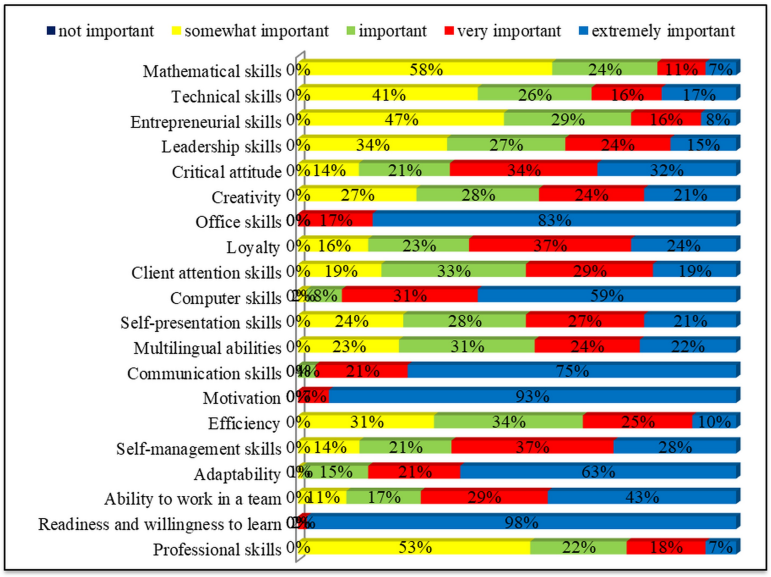

Fig. 3. Degree of acquired professional competencies of graduates of a university degree in the field of the mining and quarrying sciences in the opinion of the employees.

Involving the employers in the development of competence-oriented curricula, career counseling and joint internship programs are just some of the processes which can be initiated.

References

1. M. Petrova, M. Tepavicharova, L. Boykova, E3S Web Conf., **41,** 04017 (2018)
2. M. Angelova, V. Nikolova-Alexieva, *Business climate and preconditions for reviving the Bulgarian Industry* (CHTBC, Borovetz, 2018)
3. N. Bencheva, M. Tepavicharov, Autodidactic instruments for increasing the expertise of managers and staff (CEA, Plovdiv, 2011)
4. Uteubayev, T., Petrova M.M., I. Lyubenova, CBU International Conference Proceedings Pages, **1**, 491-495 (2018) DOI: http://dx.doi.org/10.12955/cbup.v6.1203
5. R. Pukala, Engineering Management in Production and Services, **8:3,** 43-56 (2016)
6. R. Pukala, E. Sira, R. Vavrek, Risk management and financing among start-ups, **3,** 153-161 (2018)
7. Sv. Labunska, M. Petrova, O. Prokopishyna, Economic Annals – XXI, **165:5-6,** 13-18 (2017) DOI: https://doi.org/10.21003/ea.V165-03
8. T. Odinokova, M. Bozhinova, M. Petrova, E3S Web Conf., **41,** 04015 (2018)
9. V. Zahars, M. Stivrenieks, *Journal of Security and Sustainability Issues*, **7:4,** 643-656 (2018) DOI: https://doi.org/10.9770/jssi.2018.7.4(3)
10. V. Tumalavičius, I. Veikša, J. Načisčionis, V. Zahars, V. Draskovic, Journal of Security & Sustainability Issues, **6:3** (2017) DOI: http://doi.org/10.9770/jssi.2017.6.3(7)
11. Yu. Dyachenko, N. Nenkov, M. Petrova, I. Skarga-Bandurova, O. Soloviov, Biologically Inspired Cognitive Architectures, **26,** 130-135 (2018)

12. *Competency and Competency Framework Survey* (CIPD, London, 2007)
13. Lisbon Council, *Europe 2020: Why Skills Are Key for Europe's Future?* URL: http://www.lisboncouncil.net/publication/publication/54-skillseuroprsfuture.html
14. D. Dubois, W. Rothwell, *Competency – Based Human Resources Management* (Davies – Black Publishing, London, 2004)
15. *Development and implementation of an information system to evaluate the competence of the workforce in sectors and regions* (ECUD, Brussels, 2010)