

Human Capital Formation of the Enterprise: the Role and Experience of the Specialized Department of the Pillar University

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Abstract—This research is devoted to the analysis of Pillar University's specialized department activity and its role in enterprise human capital formation. The essence of enterprise human capital and peculiarities of its formation are revealed. The interrelation of human capital with other production factors is shown. The profile of specialized departments is given as universal educational platforms of universities and enterprises and as a tool for enterprise human capital formation. The foundation of assessment of core enterprise human capital formation is constituted by sociological survey of its employees – specialized department graduates. The results of the survey conducted are grouped into sections regarding the assessment of education program satisfaction, internship during training process and competencies obtained which facilitate professional adaptation. Aggregate indicator (Customer Satisfaction Index) was calculated for each of the given sections. By the example of Aircraft Engineering Department of Pillar University (Don State Technical University) qualitative assessment was carried out and perspectives of core enterprise human capital formation were defined. It is shown that the mechanism of collaboration between the teachers of the specialized department (enterprise employees) and the students strengthens the interaction between the carriers of human capital and plays an important role in its formation.

Keywords—*Human capital, enterprise, university, collaboration, specialized department.*

I. INTRODUCTION

Human capital management in the enterprise is an important condition for efficiency improvement of its activity on the whole. In a very general understanding, human capital represents knowledge, abilities, skills, professionalism, work experience, motivation, labor potential through which a person can gain income [1]. For any modern enterprise human capital is the main resource for competitiveness improvement. Different stages of human capital development require different approaches to the mechanism and assessment of their development. Herewith, great importance should be allotted to human capital formation of the enterprise, because at this stage its "qualitative" level and further development opportunities are founded. Higher education system is a source of human capital formation. An important role is played by availability and efficient functioning of specialized departments as special structures of the university, universal educational platforms of uni-

versities and enterprises that provide specific request of the subjects of real sector of the economy for personnel with necessary skills and competencies. The efficiency of specialized departments can be assessed through the way they meet the demand of enterprises for human capital. The objective of this research is to analyze Pillar University's specialized department activity and its role in the formation of enterprise human capital.

II. RESEARCH METHODS AND LITERATURE REVIEW

The foundation of this research is constituted by systematic approach [2; 3] to enterprise management on the whole and resource approach [4; 5] which considers various enterprise resources. Herewith, attention is focused on a specific resource involved in production – it is human capital and its impact on enterprise efficiency. This research used the method of situational analysis [6] which allows studying actual phenomena in real conditions. Questionnaire survey as a method of sociological survey allowed forming empirical research base for qualitative human capital analysis of a particular enterprise. The graduates of Aircraft Engineering Specialized Department of Don State Technical University were selected as respondents who passed successfully their professional training during the period from 2003 to 2017 and currently working for the basic enterprise – Rostvertol PLC.

Studies on human capital content and its role are rather popular in modern literature. The founders of the theory of human capital are considered to be T. Shultz [7] and G. Becker [8]. They defined human capital as a complex of investments in a human, education and professional skills which enhance labor ability. In modern literature human capital is characterized as a hybrid integrating concept [9]. On the one hand, it is similar to labor resources, which is manifested in a uniform object that is a producing person. On the other hand, human capital is, first and foremost, a certain type of capital that is a capital with self-rising cost. Human capital of the enterprise is considered as a source of its competitive advantages [10]. In researches considerable attention is paid to human capital formation [12] and its influence on performance results of enterprises [11].

III. RESEARCH RESULTS

A. Human Capital: Essence and Significance for the Enterprise

Human capital, physical capital and labor resources of the enterprise constitute the most important factors for production that is the resources involved in production process which yield a certain result. G.B. Kleiner notes [13] that in conditions of postindustrial society development fall in the relative price on production means caused by innovation development will force the enterprises to replace labor resources with capital. This can be explained through production automation development accompanied by personnel reduction and increase in number and cost of the equipment used that is by increase in physical capital. But demand is growing not only for physical capital [14]. More complex and expensive equipment imposes heavier demands on qualification and skills of the personnel, therefore, the demands on labor resources “content” are changing as well. Moreover, labor resources quality must be constantly improved. At the same time, there is a sudden growth in creative work role in production activity; enterprises management is delegated to professional managers [9]. And from this time on, it is quite more relevant to consider human capital. Human capital is distinguished into independent economic category, since what is to be capitalized is a special group of individuals’ physical and spiritual abilities – knowledge, talents and skills. Herewith, human capital should play a leading part in relation to physical one: it is human capital that triggers physical one and, what is more, carries out innovation activity creating new elements of physical capital.

B. Specialized Department as a Source of Human Capital Formation of the Enterprise

The formation of human capital is greatly influenced by the system of vocational education and its relationship with business sphere. Enterprises are interested in close interconnection with the universities as they need advanced personnel adapted to work in specific manufacturing conditions [15]. Strengthening interaction between specific enterprises with the university can be achieved through the creation of specialized departments system – unified education platforms of the university and the enterprise – which in the best way allow connecting educational process implementation with the needs of specific enterprises. Specialized departments represent specific “extended” internship version which started its realization in Russia since the middle of the 50-th of the XX century. Due to specialized departments functioning the students are trained at the core enterprise where leading experts act as teachers. Let us analyze specific features and results of human capital formation of the enterprise by a specialized department by the example of Aircraft Engineering Department established in 2002 at Don State Technical University and Rostvertol PLC. It must be emphasized that Don State Technical University is the pillar university the main task of which is to create efficient educational and research centers focused on regional needs [16].

One of the qualitative assessment ways of human capital of the enterprise is a sociological survey of the employees – human capital carriers. The survey involved 101 people of 145 employees of Rostvertol PLC, who are the graduates of Aircraft Engineering Department from 2003 to 2017. Of those

who took part in the survey 78.2% hold the position of manufacturing process engineer, 9.9% – design engineer and 11.9% are the managers of structural subdivisions. The sociological survey results of Aircraft Engineering Department graduates can be conditionally grouped into three sections. These are the sections regarding the assessment of education program satisfaction, internship during training process and competencies obtained which facilitate professional adaptation. For each of the given sections one can calculate aggregate indicator – Customer Satisfaction Index (CSI) which is calculated on the basis of customer’s comprehensive assessment of quality of goods and services. The measurement of Customer Satisfaction Index has rather a long history. Its assessment methodology has been developed by C. Fornell [17] back in the late 1980s – early 1990s. This indicator is currently one of the most popular quantitative metrics for customer’s experience and perception assessment. CSI is an indicator that synthesizes information about the respondents’ perception of the quality of services provided. This indicator provides information from respondents’ standpoint at the same time measuring perceptions and expectations and allowing one to identify priorities among improvement opportunities and motivate their achievement.

CSI can be calculated for private sector or state organizations. Thus, in some researches [18] Canadian student satisfaction with higher education programs was assessed by way of American Customer Satisfaction Index (ACSI). The results obtained in accordance with the calculations carried out for each of the three sections of Aircraft Engineering Department graduates survey are presented in Table. 1. The CSI value was determined for each of the three sections as an average value based on the data obtained for the corresponding sociological survey section. Threshold index values ranking in accordance with the methodology of Russian National Platform EPSI Rating [19] is presented in Table 1.

TABLE I. RESPONDENTS’ SATISFACTION INDICES WITH EDUCATION PROGRAM, INTERNSHIP AND PROFESSIONAL COMPETENCES OBTAINED

CSI indices	Ranking of CSI levels				
	Unacceptable <55	Poor 55-60	Acceptable 60-70	Good 70-80	Excellent >80
Education program satisfaction			64		
Internship satisfaction				75	
Satisfaction with obtained professional competences				72	

The results shown in Table.1 allow characterizing respondents’ satisfaction with education program as “acceptable”, and internship satisfaction during training process and satisfaction with professional competences obtained as “good”.

In general, the source of specialized department efficiency in human capital formation is seen to us in synergistic effect emergence through strengthening enterprise interaction with the educational organization. This synergistic effect is ampli-

fied by the perception improvement of professional knowledge, abilities and competences in the course of interaction between the workers [20]. An important role is played here by the mentoring institution which strengthens the interaction between the carriers of human capital. The respondents also formulated particular proposals for improvement of education program and adaptation of new employees at the enterprise. The results obtained indicate the need for the strengthening of professional knowledge, general cultural skills which form holistic outlook with future professionals and the need for economy and enterprise management studying.

IV. CONCLUSIONS

Specialized departments, as special structures of the university providing specific request of real sector subjects of the economy for personnel, play an important role in human capital formation of the enterprise. The research conducted let single out the following key perspective directions of Aircraft Engineering Specialized Department activities. Firstly, it is the strengthening of mentoring institution which is based on the mechanism of collaboration between the students and teacher-practitioners. Secondly, it is the development of interdisciplinary approach that contributes to the formation of students' systemic thinking and general cultural competencies. Thirdly, it is the ensuring expansion of knowledge and practical skills with the students in narrow special disciplines including programming and computer modeling.

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