SECTION 4. ENTERPRISE ECONOMICS AND PRODUCTION MANAGEMENT

4.1 Aspects of the theoretical study of human capital

The social and economic nature of the construction of market production in Ukraine, especially at the end of the twentieth century and the beginning of the twenty-first century, inevitably led to the need not only to strengthen the material base of production, but above all to develop its intellectual potential. And the owner and bearer of such potential is the person whose economic essence in a market environment is human capital with specific content, social character and monetary expression.

Therefore, human capital in a society based on different forms of ownership of the means of production and the mode of employment of labour is an important category whose research is relevant and essential to theory and practice.

The pioneers of the concept of human capital were A. Smith and K. Marx, who, on the basis of an analysis of the anatomy of the capitalist mode of production, uncovered the value, duality and reproduction of labour. However, the theory of human capital as an independent branch of economic thought was formed in the 2nd half of the 20th century after the publication of the results of the research of T. Schulz [171] and G. Becker [165].

Modern Ukrainian and Russian scientists pay more attention to the problem of labour potential, which is connected with human capital. However, this link has not been sufficiently explored. Among the representatives of this group of scientists are N.D. Lukyanchenko and L.V. Shaulskaya, I.Y. Bazhana, D.P. Boginju, N.I. Yeshinova, M.N. Kima, V.M. Lycha, N.A. Volgina and Y.G. Odegova, Y.P. Kokin and G.E. Schlander, among others.

The issue of labour potential has also been addressed in our work, which has also failed to address the relationship between labour potential and human capital.

The purpose of this study is therefore to identify a mechanism for revealing the nature and methods of research on human capital by stages of its formation and development: pre-production, reproduction and innovation, as well as the efficiency of the use of labour potential in the structure at the local level. Development of a cost model and estimation of the level of human capital by indicators of the Donetsk region.

In the economic literature, the nature of human capital is ambiguous. If the productive level of human capital is considered to be productive, it usually does not take into account the pre-production stage, to which we can refer the period of human capital formation from the birth of a person to the entry into working life. For example, by looking at the essence of human capital in industry, V.B. Vaginskaya by human capital of industry means: The mobile set of quantitative and qualitative characteristics and professional competencies of industrial workers, which has been created by the parties to the social and labour relations and is growing in volume as a result of the effectiveness of State and industrial personnel policies, Investment-oriented human capital assets and sound production conditions for their use» [168, c. 6].

As can be seen from the above definition of the essence of human capital, important criteria such as the value of its level and the duration of its formation are not reflected. Attention should also be drawn to the characteristics expressed by Harry Stanley Becker [166], founder of the theory of human capital, to which he referred the totality of the productive capacities formed and developed as a result of the investment, The personal characteristics and motivations of individuals who are owned and used in economic activities that contribute to the increase of labour productivity, by which they influence the increase of their income, the income of the owner of the means of production, and the national income of the society. Consequently, human capital is not only the sum total of these characteristics, namely, the formation and development resulting from investment, but also the accumulated stock of productive abilities (health, knowledge, skills, motives) that belong to the human being, are inseparable from it and it makes good use of them.

Understandably, the dramatic leap in human progress over the past 50 years has drawn the attention of world science and the investment character of the intellectual development of human capital. Therefore, most studies consider as human capital the investment component in the enhancement of human abilities leading to an increase in the employee’s income. In addition to T. Shultz and G. Becker, L. Turrow [170], F.

Makhlup [167] and a number of Russian researchers also stand in these positions.

In view of the above, the essence of the human capital of the individual can be formulated as a set of useful qualities of the individual that have been developed and developed in the process of human activity: health, mental and physical abilities, general and professional knowledge, Experience and motivation, expressed in terms of value and suitability for work, which are inseparable from and generate income from the person they own.

Many researchers of human capital tend to allocate types of capital from its composition. The Russian scientist V.T. Smirnov approached the classification of types of human capital in the most detail with the co-authors [169]. In particular, it classifies elements of human capital in terms of liquidity and alienation, which allows it to be measured by levels of economic and labour management:

individual (micro - individual human capital);

a single enterprise or group of enterprises (meso-level - human capital of a firm);

a state as a whole (macro-level - national human capital).

Illiquid human capital (inseparable from human being - inalienable) according to the authors' theory are:

health capital (biophysical);

cultural and moral;

labour;

intellectual;

organizational and entrepreneurial.

These types of human capital are considered inalienable because they are unique to the individual. At the same time, on the enterprise, regional and State levels, because of the social division and cooperation of labour and their synergistic effects, the authors refer to the group of liquid (alienable) human capital such as:

social;

customer (brand-capital)

structural;

organizational.

Taking this into account, the combination of illiquid human capital with productive factors of labour we consider as a category of labour potential at the local level (workplace). At the level of the enterprise (firm) and above, the inalienable capital of the individual grows at the expense of liquid (alienable) capital, becoming total social human capital. But it is also important to consider the historical dimension of human capital formation, which reveals the stage of its development. We emphasize the following:

pre-production

reproductive;

innovative.

The latter is linked to the qualitative development of staff skills. The share of each stage in total costs will be the cost structure that is realized in the labour market. As innovation processes develop, the labour market becomes a market of human capital, structured by sectors of simple labour, which, according to V.T. Smirnov's certificate, represented 12,8% of the human capital market; market for skilled workers - 32,5 per cent; the market for the intellectual capital of middle-level specialists - 17.7%, specialists with the highest level of qualification – 16,1%.

Researching the reproduction process of the functioning of the labour force, K. Marx justified in 1 volume «Capital» its value equivalent, which is determined by the amount of means of life for the satisfaction of daily and prospective needs, i.e. the cost of labor. But here we can put the mark of equality between labor and human capital only at the moment of its production estimation, without taking into account human capital expenditure at the pre-production stage. We also do not consider the cost of professional growth of human capital, i.e. promising investment in its development. In addition, it must be borne in mind that the resulting human capital, when entering productive activities, is linked to productive resources, working conditions and motivation. Thus, it acquires a certain productive force of work, transforms into a working capacity at the local level (the workplace).

Investment in human capital related to the professional growth of workers in production, in essence, they are an incremental part of the cost of improving its quality by means of continuous on-the-job training and can be attributed to the innovation stage of human capital development in the productive environment.

Therefore, in addition to the cost of labour in production, which according to Marx determines its level of reproduction, human capital should include the cost of human capital at the pre-production stage of its formation and development, and this value is measured on an annual average by the ratio of the total amount of human capital formation at the pre-production stage to the number of years of that stage. Thus, the pre-productive stage of human capital formation covers the time from the birth of a person to the beginning of his or her employment. The costs of nurturing and educating people vary from time to time: they are smaller in early childhood and increase as they grow older, as education improves, as the demands of scientific and technological progress increase.

The cost of human capital during the pre-production stage is borne by the income of the parents as well as by State or other charitable funds for orphans and is in the nature of a credit investment in human capital. And this credit is essentially irrevocable, as the new generation transfers it to their children, and this cycle of human capital manifests the law of expanded labour reproduction. And since the human capital so defined is part of the newly created (added) value, some of which, under market conditions, is assigned by the employer or owner of the means of production. Human capital is the carrier of certain industrial relations and in this sense, it is an economic category.

Consequently, the calculation of the value of the human capital (ΣVhc) in annual average terms can be performed according to the following formula proposed by us:

$$\sum Chcp = (\frac{Cppf}{T} + \frac{Chcp}{Icp} + \Delta Chcp) , \quad (1)$$

where *Cppf* - is the cost of pre-production human capital formation. Cash income per inhabitant (region, country) is taken into account, UAH;

T - is the average number of years of pre-production (22 years on average);

Chcp - is the annual average reproducible cost of human capital. Adopted at the level of the average annual wage of one employee, including social contributions, UAH;

Icp - consumer price index;

ΔChcp - is the average annual investment in human capital during the innovation stage of the production environment, spent by the employee or the employer on vocational training, UAH.

The value $(\frac{Chcp}{Icp})$ represents the level of real rather than nominal income, thus removing the influence of inflation.

To calculate the total cost (value) of human capital in an enterprise or on the scale of a higher level of economic management, the value (ΣChcp) is multiplied by the average number of its personnel (Nap). In this case, formula (1) would be as follows:

$$\sum Vhc = [(\frac{Cppf}{T} + \frac{Chcp}{Icp} + \Delta Chcp) \times Nap], \tag{2}$$

Considering that economic theory and practice do not yet know the methods of direct pre-production cost of human capital, we shall use the formula proposed by T.M. Osipchuk [168]:

$$C = \frac{P}{N\%}, \tag{3}$$

where C - is human capital, thousands UAH;

P - annual income from the professional activities of parents, thousands UAH;

N% - is the percentage of capitalization.

The rate of capitalization or the average internal rate of return measure the effectiveness of investment in human capital. The marginal rate of return is compared to the rate of return of alternative capital investments at all. Their level can be equated with the rate of bank deposit, dividends on securities. We have adopted the average rate of return on investments due to the permanence of this coefficient.

In order to facilitate the calculation of human capital, pre-production costs can be determined by taking into account the downscaling factor of the production phase (Fd). In this case, the formula for calculating the level of human capital would be:

$$\sum Vhc = Fd \times Chcp + Chcp + \Delta Chcp, \qquad (4)$$

At the same time, the value of human capital is not constant. It changes over time under the influence of objective and subjective circumstances. Its level varies from person to person. Individual differences are based on differences in the physical, mental and psychological capacities of individuals, in education, in vocational training, in work motivation and in other qualities.

The above-mentioned cost model of human capital formation and development is presented in Fig. 1.

It should be noted, however, that our singling out of the innovation period in our own right is to some extent conditional and motivated by the purpose of isolating the source of innovation - the means of the employer, despite their function of extended labour reproduction.

The value of human capital is expressed not only in terms of value but also in terms of price, which may vary according to demand and supply of labour. In this aspect, the price of human capital is seen as an instrument of the human capital market. But the formation and development of human capital is subordinated to the goal of obtaining a production result in the form of a product, an effect, and a profit to meet the increasing material and spiritual needs of the carrier of human capital, i.e. human. Consequently, this goal can be achieved only by combining human capital with the material and organizational factors of production, which should be understood as the availability of machinery, the technology of production, its organization of remuneration and the stimulation of labour, conditions in which human labour characteristics such as intensity, quality and productivity are manifested. In other words, when human capital is combined in a production environment with these material factors of production, it becomes a labour potential with the same value.

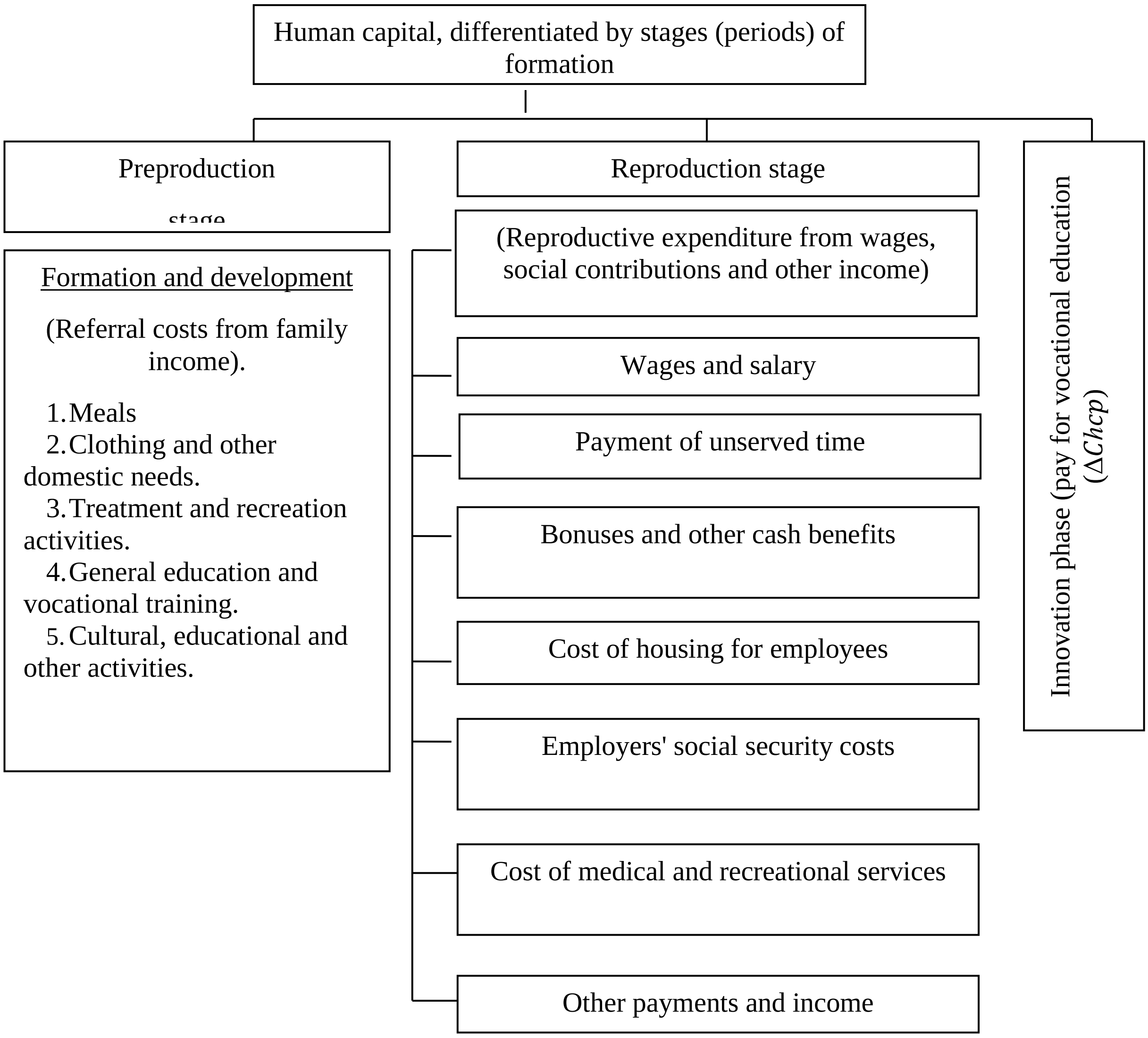

Figure 1. Cost model of human capital formation and development in enterprises

Thus, elements of labour potential create a productive force of labour in human capital. Quantitatively, human capital and labour capacity in the workplace are equal, and human capital is used efficiently through the functioning of the labour force. Consequently, human capital is a value-based substance that determines the level of labour potential.The interdependence between human capital and labour reveals a mechanism that expresses the essence, methods of measuring the formation, development and effectiveness of human capital in the structure of labour capacity at the local level (fig. 2).

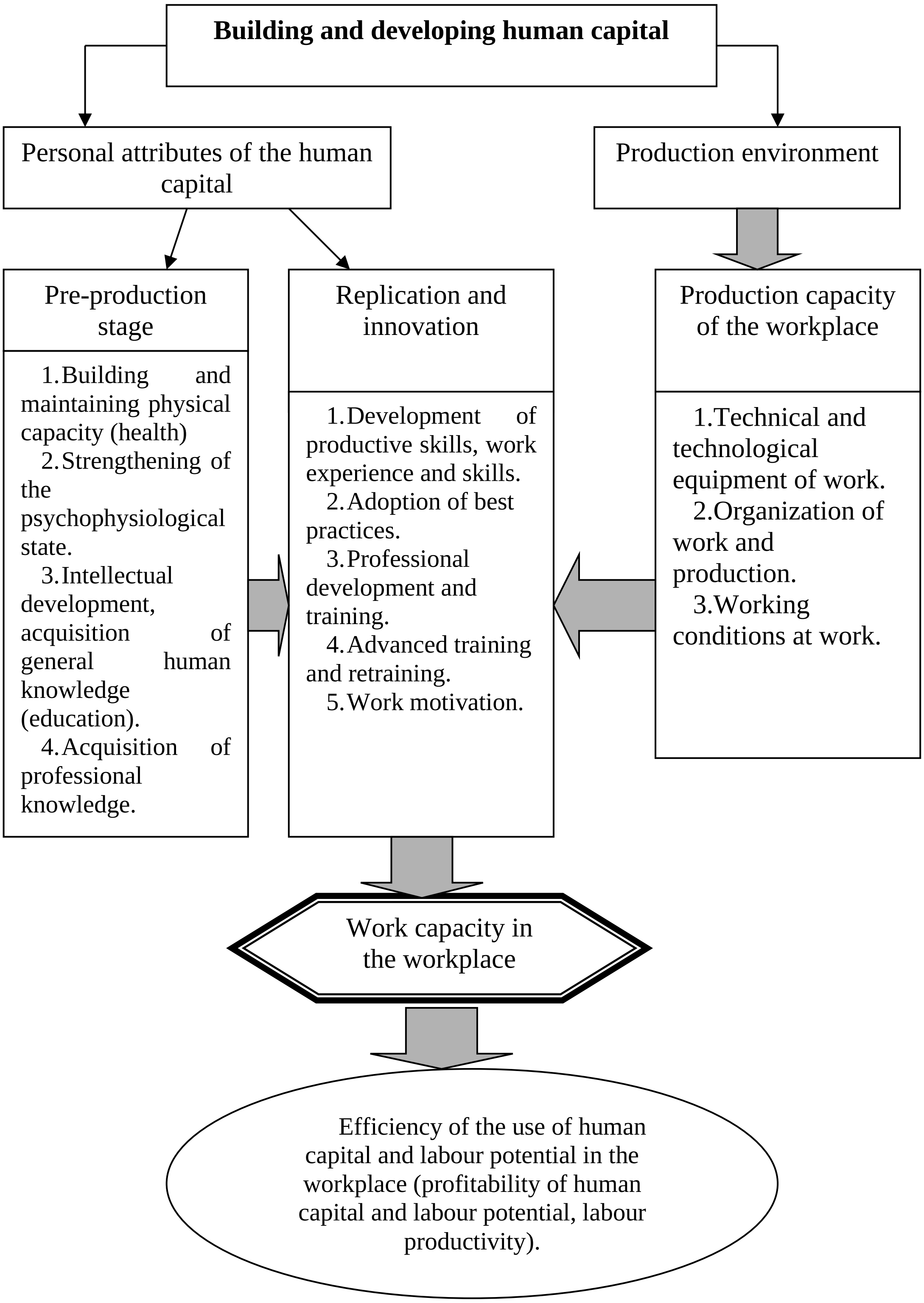

Figure. 2 Mechanism expressing substance, methods for assessing the formation, development and effectiveness of human capital in the structure of labour capacity at the local level (workplace)

As you can see from Fig. 2, the efficiency with which human capital is used can characterize the profitability of its use (Phc), which can be determined by the formula:

$$Phc = (Pg \times 100) / (\sum Vhc), \tag{5}$$

where Pg - is the gross profit of the enterprise, thousands UAH.

It is only natural that the value (Phc) will vary when objects and periods of analysis change, so it is understandable that the value of human capital can be individual and average (collective) level and the identification of legitimate changes in the efficiency of its use may be recognized as a promising area of research on the problem in the future.

As shown in Fig. 2, labour productivity is also applicable to measure the efficiency of human capital and labour potential in terms of its profitability. Wages are often calculated for this purpose as the ratio of goods to wages. But the methodology needs to be refined to assess the effectiveness of human capital and labour. In particular, it should be borne in mind that wages as a percentage of the cost of production are included in goods whose relationship to the wage bill generates double counting. In addition, it should be taken into account that paid labour in the course of its production transforms the materialized part of the good and generates profits.

Therefore, as we justified earlier, the formula for calculating the level of labour productivity can be:

$$Pl = \frac{Q - Tc}{Tc}, \tag{6}$$

or

$$Pl = \frac{P + Mc}{Tc}, \tag{7}$$

or

$$Pl = \frac{P + (C - Tc)}{Tc}. \tag{8}$$

where Q - is the volume of merchandise output, thousands UAH;

Tc - total cost of human capital, thousands UAH;

Mc - material cost of goods, thousands UAH;

C - cost of production of merchandise products thousands UAH.

Research on human capital is essential to economic theory and practice. The well-known theoretical approaches to determining the nature, level and effectiveness of human capital need to be refined and refined, which derive from the economic nature of human capital. The essence of the human capital of an individual is the set of useful qualities developed and developed in the course of human activity: health, mental and physical abilities, general and professional knowledge, Experience and motivation, expressed in terms of value and suitability for work, which are inseparable from and generate income from the person they own. In the labour market, human capital is a commodity whose price deviates from its investment-added value in response to demand and supply, thus transforming the labour market into a market of human capital.

Operating within the framework of various forms of ownership of the means of production, human capital reproduces the paid-up part of labour and profits, a large part of which is put at the disposal of the employer and, in this sense, human capital manifests itself as an economic category, which is a value-added component of labour potential.

The methods of valuation of human capital and the efficiency of its use, as well as the mechanism of correlation with labour potential, justified in this study made it possible to estimate its value in the Donetsk region by phases: pre-production, reproduction and innovation stages of formation and development, and efficiency of use in terms of profitability and productivity.

Promising areas of research in the area of human capital may include: the identification of natural changes in its level and impact in life-cycle phases, taking into account ageing, the stages of formation, and the socio-economic policies of the regions. There is also a need to improve the motivational mechanism in terms of encouraging workers to engage in innovative forms of training, leading to an increase in the knowledge and quality of work as a result of the growth of the professional level of the bearer of human capital.