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EDUCATION DEVELOPMENT AS COMPONENT OF UKRAINE'S INNOVATIVE ECONOMY BUILDING-UP

The global nature of economic systems, structure similarity of national production and resource base of many world economies have led to increased competition in the globalized world. The countries that today are leaders of innovative development have implemented their own national programs, most of which are based on the new resource –knowledge. Investing in the production of new knowledge within the strategy of innovative development has formed a new theoretical model of economic development, that is innovation-oriented economy.

The key tasks of modern Ukrainian society, the implementation of which determines the speed and efficiency of transformation processes taking place in the industrial economy, is creation of knowledge-based industries, innovative management, integration of education and science into the system of national economy, development of intellectual property, service industry with intelligent services and services that include knowledge.

Thus, the role of intellectual and human capital as a whole is growing, as evidenced by current theories of economic growth and innovation, launched by Y. Schumpeter. Solving complex problems associated with the development of innovative economy in Ukraine requires significant resources (financial, human, material, etc.) and time. However, there are areas that, under appropriate institutional and legal preconditions, could provide return today. Among them education, i.e. sector of educational services, plays the central role. In this regard appears the problem of understanding the factors that influence the development of educational component of

the knowledge economy as the main factor of innovation development of Ukraine's economy.

Evaluation of the educational level of Ukraine's regions will be held in dynamics for the period of 2014-2015 according to the following system of categories: *the number of secondary schools students per 10,000 population; the number of secondary schools; coverage of preschool education institutions; the number of students in higher education establishments of I-IV accreditation levels per 10,000 population; the number of higher education institutions of I-IV accreditation levels; the number of vocational schools; the number of vocational schools students per 10,000 population* (Fig. 1).

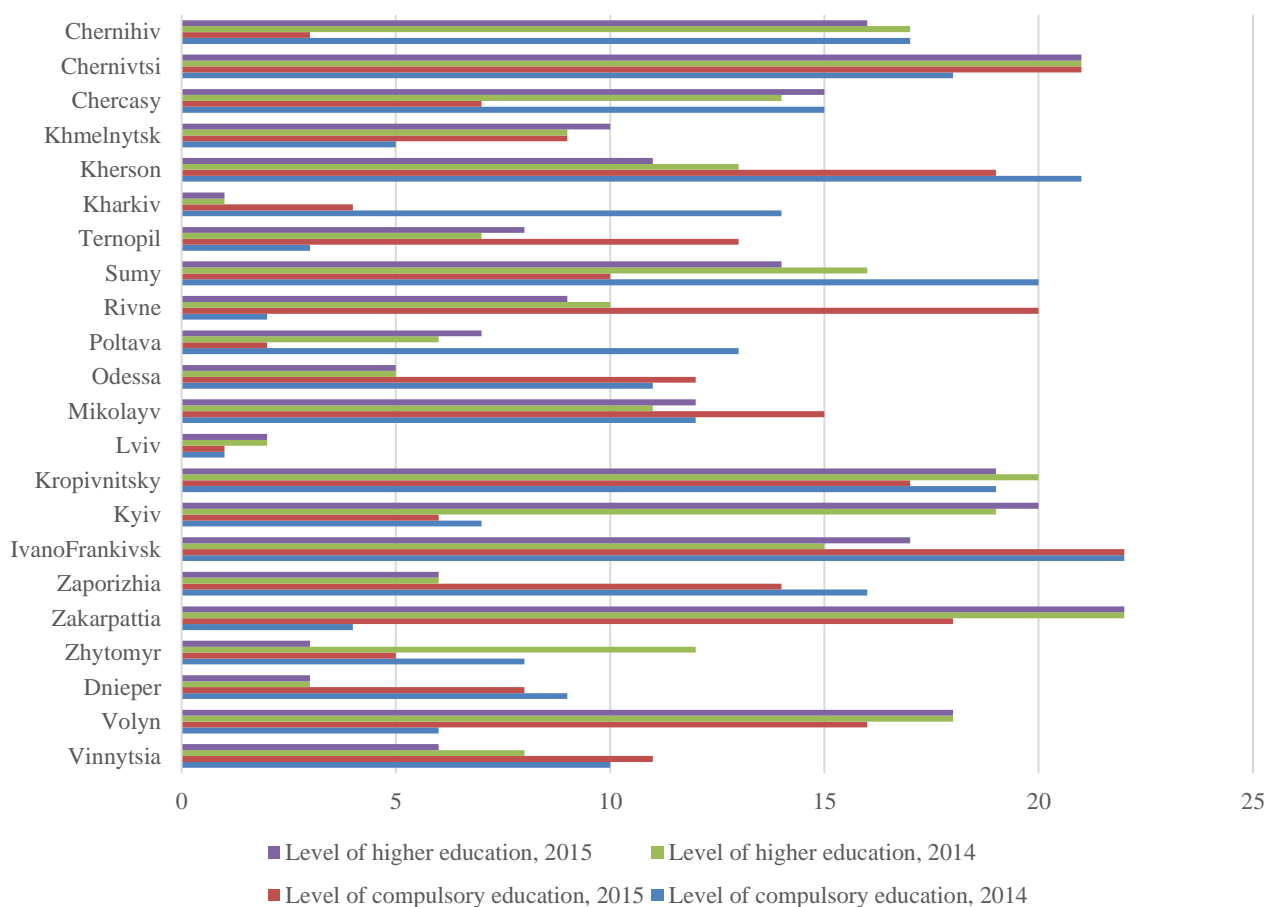


Fig. 1. Rates of synthesis (integral) index of education development in Ukraine's regions*

***Source:** calculated by the author on the basis of data from [2; 3]

According to the Figure, in 2015 the most advanced regional educational centers in terms of compulsory education level are Lviv, Poltava and Chernihiv regions (1, 2, and 3 rates among 22 regions), and in terms of higher education level are Kharkiv, Lviv and

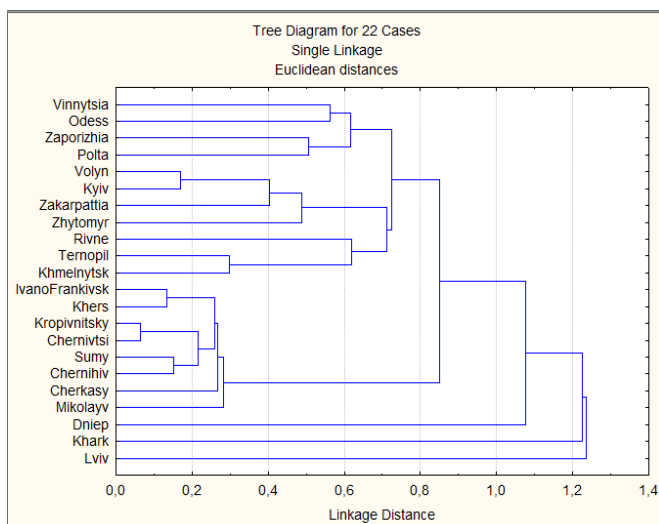
Dnieper regions (1, 2, and 3 rates, respectively). In the leading regions there is the highest coverage of basic secondary, primary education and nursery schools (79-96% in each region). Sumy, Kherson and Ivano-Frankivsk regions shared the last positions in 2014 (22-20 rates, respectively). Ivano-Frankivsk, Chernivtsi and Rivne regions shared the lowest positions in 2015 (the integrated indicators are in the range of 0.01 to 0, 07).

The analysis of the changing values of integral indicators of compulsory education by Ukraine's regions has showed that rates tended to deteriorate in most regions, including Zakarpattia, Rivne and Ternopil regions whose total population rank changed from position 10 to 18. This trend can be explained by the high correlation level of compulsory (general) education indicators with demographic situation in Ukraine (the deterioration of living standards, terms of socio-economic and political instability in the country). However, the integral indicators for Dnieper, Zhytomyr, Zaporizhia, Kyiv, Poltava, Sumy, Kharkiv, Kherson, Cherkasy and Chernihiv regions at the end of the studied period have increased (on average from 0.28 to 0.59), which indicates that the compulsory (general) education develops in the regions in accordance with the implementation of socio-economic modernization of Ukraine [1].

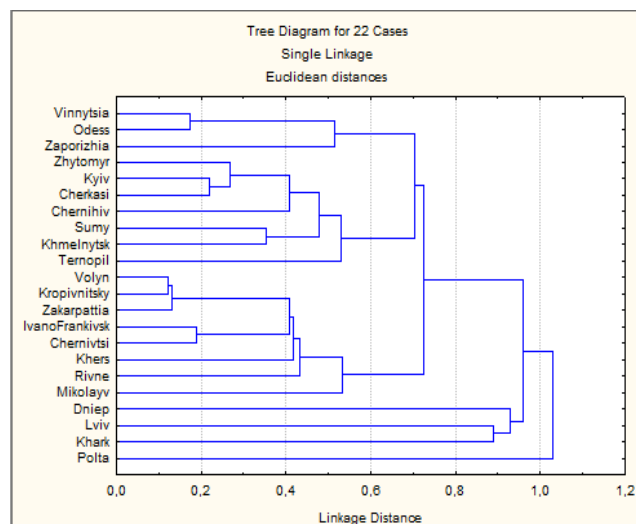
Regarding the analysis of the dynamics of integrated indicators for higher education in Ukraine's regions, we can state the positive trend in Vinnytsia, Kropivnitsky, Rivne, Sumy, Kherson and Chernihiv regions. During 2014-2015 the leading regions have been determined Kharkov (1 rate), Lviv (2nd rate) and Dnieper (3 rate) regions.

Reducing the rates to positions 1-2 for integral index of higher education occurred in Zhytomyr, Ivano-Frankivsk, Kyiv, Mykolaiv, Ternopil, Khmelnytsky and Cherkasy regions. The downward trend is due to the following factors: increased requirements for quality of higher education in Ukraine; the closure of significant number of universities and vocational schools that are unprofitable and does not meet the quality requirements and the educational market [4]; insufficient funding from the state budget.

The next stage of our research is regions' clustering in terms of education development based on agglomerative hierarchical algorithm using the software STATISTICA (Fig. 2).



a) grouping regions by the level of education in 2014



b) grouping regions by the level of education in 2015

Fig.2. Tree diagram of hierarchical combination of Ukraine's regions using single linkage and Euclidean distance methods*

***Source:** composed by the author using cluster analysis in system STATISTICA 10.0 on the basis of data from [2; 3]

The most developed group, by clusters composition, is the second group, the main representatives of which have been Zhytomyr, Kyiv, Ternopil and Khmelnytsky regions during the period of 2014-2015. As for the structure making element, there is Poltava region in the group. This cluster is characterized by higher index of compulsory education development (0.70 in 2014 and 0.58 in 2015) than the average one in 22 regions (0.44 in 2014-2015). And it is characterized by lower index of higher education development (0.22 in 2014 and 0.18 in 2015) than the average one (0.29 in 2014-2015) in Ukraine.

The third group is permanently represented by Chernihiv region. In 2015 Vinnitsa, Dnieper, Zaporizhia, Lviv, Odessa and Kharkiv regions joined this cluster. Lviv region is the structure making element in the group. This group is characterized by higher than average index of compulsory education development (0.77 in 2014 and 0.63 in 2015) and higher education development (0.58 in 2014 and 0.59 in 2015) in Ukraine.

In the first group the structure making element in 2015 was Mykolaiv region by the level of compulsory (general) education (0.27), and Rivne region by the level of higher

education (0.29). This cluster comprises regions with integral indicators of education development in Ukraine, which are below average.

The results of the study note the following:

- 1) the level of investment in human capital in Ukraine does not meet the minimum requirements of an innovative economy;
- 2) the formation of clusters of regions stratification by the indexes for education development in Ukraine in the time context for the period 2014-2015 has been caused by the heterogeneity of development levels of educational institutions of all kinds, which is related to macroeconomic indicators of regions development and its peculiarities;
- 3) the efficiency of cluster functioning results depends on the balance between the financing educational institutions and regions' focus on specific activities;
- 4) the development of intellectual capital has to become a priority as at the national level, so as in business activities, as well as at the level of individuals, which should be resulted in the costs for education development.

The innovative model of economic development cannot be built without a society with a high level of education and intelligence.

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