

# “Lifelong learning progress monitoring as a tool for local development management”

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# LIFELONG LEARNING PROGRESS MONITORING AS A TOOL FOR LOCAL DEVELOPMENT MANAGEMENT

## Abstract

The concept of learning cities and regions is recently becoming widespread both in the European and global theory of regional development acting as a tool for successful local socio-economic development management of a city and region, development of their human potential, the basis of the regional education policy of countries. Analysis of theoretical principles and, particularly, the practice of implementing the concept of learning cities and regions for Ukraine is currently a necessary condition for its sustainable development, full entry into the European and global economy, as well as the educational space. All mentioned above makes relevant the research of theory and practice of the European and world regional education policy on the example of learning cities and regions. The article analyzes the potential of the Composite Learning Index and European Lifelong Learning Index to monitor the progress of lifelong learning as a tool for local development management and proposes the list of indicators and measures – the Ukrainian Lifelong Learning Index – adapted to the Ukrainian education area.

## Keywords

learning city, learning region, lifelong learning, Composite Learning Index, European Lifelong Learning Index, Ukrainian Lifelong Learning Index

## JEL Classification

I25, R50, O15

## INTRODUCTION

Lifelong learning is a factor of the competitiveness of individual territories and the state as a whole, a determining factor and a tool for local development management. In modern socio-economic conditions in Ukraine, it is the lifelong learning which actualizes the research of innovative approaches to the organization and management of an effective regional education policy. One of these innovative forms is the introduction of the concept of a learning city or region, which embodies the understanding of the ability to learn as a factor of competitiveness of any city or region. Such a direction of territorial integration of all agents of management, education, culture, science, non-governmental organizations with the support of local authorities visualizes the idea of learning cities, regions and communities.

According to the results of UNESCO studies, people who are able and learn lifelong can better meet new challenges and find answers to them, which testifies to the reasonability of the development of learning communities, cities and regions for the socio-economic development of the country, ensuring its sustainable development. The educational level of the population of cities, villages and regions as a whole as parts of a single country is an important component of indicators of regional development (indicators of development), which means readiness and ability to solve intellectual problems, to support scientific and technological progress.

Theoretical justification, development and experimental verification of the conceptual foundations of regional education policy of Ukraine, oriented on the creation of competitive and knowledge potential of each region and the country as a whole, is an actual and well-timed scientific and practical task. Studying the foreign experience of implementing the concepts of learning cities and regions and adapting its rational ideas to the national cultural and education area is a requirement for the development of the human potential of Ukraine, the basis for the regional education policy and the sustainable socio-economic development of the state as a whole.

It is worth emphasizing the thoroughness of the theoretical study of the conceptual foundations of regional education policy. At the same time, the practice of its implementation visualizes a number of unsolved for today issues, including the use of tools for monitoring and for formation and local development management of lifelong learning at the level of a city, region or country. The introduction of the concept of a learning city or region provides an operational and pragmatic approach to lifelong learning at the level of a particular community. And this is not an abstract theory, because, if there is a will in society and a desire to build a learning city or region, it needs a clear and accessible tool to determine progress on this way. The importance of such a tool is to understand the fact that building a learning city or region is a continuous process, and there is no limit when the city or region would achieve the desired status. Herewith, there are objective signs of a learning city or region and they relate more to the fact what a city/region does in this direction, but not what it is.

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## 1. LITERATURE REVIEW

Theoretical substantiation of the conceptual bases of learning cities and regions can be found in the many works of scientists all over the world. In their studies, Morgan (1997) and Hudson (1999) researched the importance of innovation and learning to social and economic development for the whole economy, regions and firms. Florida (1995), Larsen (1999), Longworth (2006), Rutten and Boekema (2007) investigated general principles and theoretical and practical conceptualization of the “learning” city or region phenomenon and its connection with regional development strategies. Jordan, Longworth, Osborne (2014) overviewed and analyzed the current state of learning city/region development across Europe, Yarnit (2015) explored the global learning city movement, especially through the UK history. The monograph by Roel and Frans (2007) presents current research in the theory and practice of interaction among all agents of regional education policy in Europe, the USA and South Africa within the implementation context of the concept of learning cities and regions.

Lukianova (2016) who has numerous scientific studies related to the important problems of vocational and adult education, learning regions as components of lifelong learning made a significant contribution to the development and dissemination

of the concept of lifelong learning for the Ukrainian community, researched the emergence and development of the concept of the “learning region” in modern Western science and political practice.

The problem of the emergence and development of “learning region” as a new direction of regional development is described in the studies of Sheraizina and Aleksandrova (2006), examples of the creation and development of “learning cities and regions” are described by Ovsienko (2009) and Naiman (2013) and so on.

At the same time, in the theory and practice of scientific-methodical, legislative, organizational and managerial provision of the educational sphere in the context of the policy of regional development of Ukraine, the raised problem has not been adequately reflected. In particular, there are no works in which there would be presented mechanisms for monitoring and diagnosing the results of education policy in the region concerning the provision of sustainable regional development, as well as study of the impact of lifelong learning on the welfare and life satisfaction of the population in a particular region.

Despite quite thorough theoretical study of conceptual bases of regional education policy, its implementation practice indicates a number

of unsolved for today issues. In particular, the assessment of the region's progress in achieving the status of a "learning region" provokes much discussion due to the lack of an effective tool for monitoring the process. Analysis of the world practice shows that there are some solutions to this issue, for example, Composite Learning Index (CLI), which was developed by the Canadian Education Council (the 2010 Composite Learning Index, 2010) and includes 17 indicators and 26 measures.

CLI became the basis for developing the European Lifelong Learning Index (ELLI) and German Learning Atlas (Deutscher LernAtlas) (European Lifelong Learning Index). ELLI is a total index, which consists of 17 indicators and 36 measures and provides a number of different data and statistics to reflect a wide range of learning activities throughout life in the countries of the European Union.

The analyzed indices are effective monitoring tools for building learning regions and they are actively used by various stakeholders for decision-making. However, the practice of using these tools in assessing progress while building a learning city indicates certain problems, and, in some cases, it shows the inability to use them at the level of the region community in Ukraine.

Research of the conceptual foundations of regional education policy started in the 70s of the 20th century. In particular, within the project of creating "Educating Cities", funded by the Organization for Economic Cooperation and Development (OECD), seven cities in Canada, Japan, Australia, the USA and Europe were offered a new way to treat the regional education system. As a result of the project, the term "educating city" was transformed into the term "learning city", and the idea of learning cities eventually gained considerable popularity. For example, the UNESCO Global Network of Learning Cities in 2017 accounted for about 40 members and was a sufficiently powerful authority at the international level (Karlsen, 2015).

A little later, in the 90s of the 20th century, the education policy at the regional level became the focus of the governments of most European Union countries. In particular, the German government

adopted the program "Learning Region" (Lernende Region), which was formed by the European Social Fund. One of the first interpretations of the peculiarities of educational regional policy became the European Commission's project "Towards a European Learning Society" (TELS). This project was the basis of the European document "On Local and Regional Dimension of Lifelong Learning", which was adopted by the EC in 2001. After the completion of the project TELS, the European Commission initiated the program R3L (Region Life Long Learn).

Along with the programs and projects of the European Commission, the Organization for Economic Cooperation and Development (OECD) has also built its policy in the field of the establishment of regional education policy. Based on the analysis of successful European regions, the organization formulated its vision and understanding of the concept "learning region", which was reflected in the work "Cities and Regions in the New Learning Economy" (OECD, 2011). The work mentioned became a thorough empirical study of the phenomenon of "learning region", in which particular attention is paid to the economic benefits of regional development.

The aim of the article is to study the theoretical tools for monitoring the lifelong learning progress at the level of a city, region or country and to analyze the international experience of its application in order to prepare proposals for its adaptation in modern socio-economic conditions of Ukraine.

## 2. THEORETICAL BASIS

Thus, a regional education policy combines a variety of political, socio-economic, cultural and educational factors. The policy of learning cities and regions is aimed at creating such an economic and cultural environment that would contribute to the educational potential of all its agents. The learning cities and regions play an extremely important role in the development of social stability of communities, promote prosperity, personal and professional growth, mobilize resources to maximize the disclosure of human capital.

Definitional analysis of the concepts “learning city” and “learning region” done by us in the work of Pryima (2015) leads to several important conclusions. First, a learning city or region has a clear commitment to focus on training and dissemination of knowledge as the most important factor of development. This commitment is supported by all social partners – participants of the education services market – civic organizations, government, business and education service providers. Their common purpose, identity and trust between different members act as a driving force in achieving common goals and developing the human capital of the region. Second, the policy, which is aimed at creating a competitive and knowledge-containing region’s capacity, which is based on the principle of lifelong learning, is a common feature of learning regions. Finally, the third feature is overall efforts to social identity, expansion of trust among members of society and its sustainable development. A learning region requires not only improvement of the education level in the region, but also a certain level of solidarity and interaction development among all participants of regional development.

The basic idea of a learning city or region implies that competitiveness of any city or region under conditions of globalization is determined by its ability to learn. In practice, this thesis is realized within a framework of continuous integration process of all stakeholders and agents of regional subsystems and public institutions based on mutual cooperation in order to create an accessible, effective and efficient education infrastructure of the region.

Recognizing the importance of theoretical understanding of the concepts “learning city” or “learning region”, it should be noted that the implementation of the idea into the practical level is seen as difficult in most cases. The lack of effective tools for identifying a learning city or region, and the mechanisms for monitoring the progress on the way of the idea implementation resulted in decline of enthusiasm from the side of the concept supporters. That’s why educators and researchers, authority and community take an active part in the development of the tools for monitoring the progress of lifelong learning development at the level of a city, region or country.

As mentioned above, at the beginning of the 21st century, such tools are Composite Learning Index and European Lifelong Learning Index. The practical significance of both indexes is to understand that lifelong learning and education directly or indirectly affect the welfare of the individual and the country. It is not for nothing that among the key socio-economic indicators of the given indexes there are the level of income of the population, the level of employment and the level of unemployment, the level of health and the level of life satisfaction. There is no doubt that there are many factors including “casual” ones that affect the welfare (geographic location, natural resources, etc.). At the same time, it is generally accepted that the socio-economic development of the country depends precisely on human capital, the level of development of which is influenced by lifelong learning and education. Indicators and measures of both indexes based on factor analysis provide an objective assessment of the human capital.

A characteristic feature of CLI and ELLI is that they are based on four principles (learning pillars) that were formulated in the report of the UNESCO International Commission “Learning: The Treasure Within”, namely learning to know, learning to do, learning to live together and learning to be (Delors et al., 1996). At the same time, in order to analyze both indices, they will be presented in tabular form (Table 1).

**Table 1.** Learning pillars

Source: Developed by the authors on the basis of the 2010 Composite Learning Index (2010).

Learning pillar	Description
Learning to know	Involves the development of knowledge and skills that are needed to function in the world. These skills include literacy, numeracy and critical thinking
Learning to do	Involves the acquisition of skills that are often linked to occupational success, such as computer training, managerial training and apprenticeships
Learning to live together	Involves the development of social skills and values, such as respect and concern for others, social and inter-personal skills and an appreciation of the diversity
Learning to be	Involves activities that foster personal development (body, mind and spirit) and contribute to creativity, personal discovery and an appreciation of the inherent value provided by these pursuits

## 2.1. Learning to know – formal education

The dimension of learning to know predominantly assesses the learning of young people within the formal education system. By including data on the formal system, ELLI measures the input and outcomes of the area in which most Ministries of Education allocate the vast majority of their budget and on which policy decision-making and policy directions currently place their emphasis. In terms of investment, this dimension contains indicators on total expenditure on education and training. The range of learning opportunities for formal education, which are currently being examined, are pre-school, school, higher education and adult education institutions. This dimension also measures learning outcomes from traditional core disciplines, such as math, science and reading in secondary schools, as well as completion and attainment rates for post-secondary education (see Table 1 in Appendix).

## 2.2. Learning to do – vocational learning

This dimension captures the participation rates, learning opportunities and investment (by employers, government and individuals) in job-related skills. The expectation is that these skills can improve economic performance and social inclusion by increasing job prospects and career opportunities for the individual and can improve competitiveness for an enterprise, region or country. This dimension predominantly measures adults' continual professional development at their place of work through formal, non-formal and informal learning opportunities. In addition, it captures students' participation in the vocational track of the formal education system, which, depending on the country or region, can also include young people within compulsory education. It reflects investment in learning by employers, government and the individual. This dimension is limited, as the data available only measure input, output and process indicators, and there is no assessment of outcomes (see Table 2 in Appendix).

## 2.3. Learning to live together – learning for social cohesion

This dimension measures individual-level attitudes and dispositions that promote social cohesion, such

as trust, intercultural competence and political and community engagement. Learning and education have been considered from the outset to be much more than an issue of creating skills for employability and have been part of a social policy tool to sustain democracy, create social mobility and increase levels of health and social inclusion. This dimension tries to capture the learning of the values of democracy, tolerance and trust, as well as skills for engaging with other people and the interest to do so. These competences are learned throughout life. Learning to live together starts at home with learning from parents and siblings and continues through interactions at school and work and through involvement in civil society organizations. In schools in most European countries, there is a specific curriculum subject on citizenship through which many of these competences are developed. The investment of individuals, families, communities and countries is often much more hidden for the learning to live together dimension, as there are fewer exams and qualifications in this field compared to traditional subject-based disciplines, such as math and science. However, the negative consequences for society in terms of social cohesion and democracy can be high if there is an absence of social competences (see Table 3 in Appendix).

## 2.4. Learning to be – learning as personal growth

This dimension predominantly measures self-directed learning and individuals' efforts and investment in learning. This learning is facilitated by government provision and information provided on learning opportunities, but note in their inquiry into the future of lifelong learning, these provisions are considerably less than the provisions for compulsory formal education. This dimension captures informal and implicit learning that happens through engagement and participation in the home and through community and cultural activities. The implicit learning measures include activities undertaken in which the individual does not set out with a learning objective in mind and for which there is no certification of learning achievements from participation. Nevertheless, learning is often highly successful through this style of learning due to the fact that participation is usually motivated by personal interest. Learning in the

home often makes use of the internet, incidental access to information, virtual communities and virtual relationships.

In addition to implicit learning, there is one indicator in this dimension on explicit participation in lifelong learning. This indicator, which could potentially fit in all dimensions, is placed here due to the fact that individuals participate in learning for many reasons. Ultimately, participation in lifelong learning is largely voluntary, which means that those who choose to engage in it are more likely to be motivated by the interests of personal growth and development, which is the focus of this dimension (see Table 4 in Appendix).

Thus, the comparative analysis of CLI and ELLI allowed to reveal their common and distinctive features, the understanding of which will enable us to propose the lifelong learning index adapted to Ukrainian realities.

The practice of applying the Composite Learning Index and European Lifelong Learning Index in the realities of the Ukrainian regional education policy points to the need to adapt these indices. On the one hand, the European Lifelong Learning Index is a further modification of the Composite Learning Index, which is sufficiently standardized to be used for measuring in the countries of the European Union. On the other hand, the current socio-economic conditions, the realities of legal regulation and traditions of the Ukrainian educational system in many cases make it impossible to use European tools.

Thus, let's formulate the list of indicators of the Ukrainian version of the index – Ukrainian Lifelong Learning Index (ULLI).

### 3. RESULTS

#### 3.1. Learning to know – formal education

The ELLI indicators “Early childhood/preschool education” and “Output of secondary education” have been adapted to Ukraine, especially as in 2018, Ukraine will join the Program of International Student Assessment – PISA for

the first time. The characteristic for CLI indicator “Share of adults (25-64) who have completed a university program” is more acceptable to Ukraine than the ELLI indicator “Share of 30 to 34 years old with tertiary education”. The network of higher education institutions in Ukraine is rather extensive, a significant percentage of the population living in cities (72%) reduce the importance of such CLI indicators as “Average travel time to elementary or secondary school” and “Average travel time to university or college”. At the same time, the ELLI indicator “Total public expenditure on education as % of gross national income” is relevant for national realities, because despite of a rather significant percentage of GDP (about 5%) for education, in fact, in recent years, it has been reduced (for example, in 2009, it was 7%). Moreover, information about such a percentage across the regions of the country will be relevant in the context of decentralization.

The following list of indicators and measures is the most adapted to Ukrainian realities (Table 2).

**Table 2.** The adapted dimension of learning to know

Source: Developed by the authors.

ULLI	
Indicators	Measures
Participation in early childhood/ pre-school education	Percentage of children aged 4 to compulsory school age attending formal education institutions
Output of secondary education	Student performance in reading (PISA) Student performance in math (PISA) Student performance in science (PISA)
University attainment	Proportion of adults (25-64) who have completed a university program
Participation in post-secondary education	Adult (25-64) participation rates in formal education and training
Supply of formal education infrastructure	Total public expenditure on education as % of gross national income

#### 3.2. Learning to do – vocational learning

Indicators of both indices coincided in part of vocational training courses. ELLI indicators that relate to workplace training are more relevant to non-formal training. Herewith, the indicator concerning the proportion of employees who use Internet in their work is not so important, in our opinion, to include it in the list. At the same time,

studying the share of enterprises that provide workplace training may be an additional motivation for the employers to develop this direction.

Thus, the following list of indicators and measures is the most adapted to Ukrainian realities (Table 3).

**Table 3.** The adapted dimension of learning to do  
Source: Developed by the authors.

ULLI	
Indicators	Measures
Output of formal vocational education and training	Graduate quota in upper secondary education (vocational programs)
Participation in non-formal vocational education and training	Participation in job-related non-formal education and training
	Participation of employees in CVT courses
	Numbers of hours of CVT courses
Supply of non-formal vocational education and training	Enterprises providing CVT course
	Relative costs of CVT courses
	Enterprises providing any other form of training (non-CVT)
Availability of workplace training	Expenditure in training as part of labor market policies
	Share of employers who offer any type of classroom or workplace training for their employees

### 3.3. Learning to live together – learning for social cohesion

Traditionally, CLI focuses on accessibility to social infrastructure. An extended network of social institutions (libraries, museums, clubs, etc.), which has remained since the Soviet times, reduces the problem of this issue in Ukraine but does not remove it completely from the agenda. Both indexes pay particular attention to intercultural integration, which is rather relevant for Ukraine where more than one hundred nationalities live. According to both indexes, volunteering is an important factor of active civic position and a factor of social cohesion.

In the indicator “Tolerance, trust and openness” was summarized the list of people who have the right to live at their discretion and this right is provided by Ukrainian legislation.

Thus, the following list of indicators and measures is the most adapted to Ukrainian realities (Table 4).

**Table 4.** The adapted dimension of learning to live together

Source: Developed by the authors.

ULLI	
Indicators	Measures
Participation in active citizenship	Involvement in work for voluntary or charitable organizations
	Membership in any political party
	Working in a political party or action group
Tolerance, trust and openness	Opinion that the country’s cultural life is either enriched or undermined by immigrants
	Opinion that everyone should be free to live their own lives as they wish
	Trust in other people
Inclusion in social networks	Meetings with friends, relatives or colleagues
	Anyone to discuss personal matters with

### 3.4. Learning to be – learning as personal growth

It is quite expected that both indices pay a lot of attention to Internet education. Ukrainian realities point to rather weak positions in this context concerning the technical support. The situation in the context of a city/village and across the regions is quite different. The problem is also deepened by the lack of qualitative Ukrainian learning content. Consequently, the monitoring of this indicator is included in our list. The indicators of both indices in the context of learning through culture and sport are similar. The indisputable practical interest is the indicator “work-life balance” connected with socio-economic indicators.

The analysis shows that ELLI is the list of indicators and measures adapted to Ukrainian realities (Table 5).

**Table 5.** The adapted dimension of learning to be

Source: Developed by the authors.

ULLI	
Indicators	Measures
Participation in sports and leisure activities	Participation in sports
Participation in learning through culture	Attendance at ballet, dance, opera
	Attendance at ballet, dance, opera
	Attendance at cinema
	Attendance at concerts
Participation in continuing/ further education and training	Visiting museums/galleries
	Participation in lifelong learning

**Table 5 (cont.).** The adapted dimension of learning to be

ULLI	
Indicators	Measures
Self-directed learning through media	Personal use of internet
Supply of media for self-directed learning	Internet access in households
Work-life balance	Accordance of working hours with family commitments

### 3.5. Economic and social outcomes of learning

As mentioned above, both indices are used to assess the impact of learning and education on the welfare of the population, people's satisfaction with life and they are important tools for local development management. Social and economic learning outcomes with appropriate indicators are used for this.

In CLI, social and economic learning outcomes are defined by 2 economic and 5 social indicators:

### 3.6. Economic indicators

- average income;
- unemployment rate.
- Social indicators
- adult literacy;
- civic engagement;
- early childhood development;
- population health;
- environmental responsibility.

At the same time, ELLI similar indicators are more reasonable and detailed.

ELLI relies on the fundamental assumption that all learning occurs with the implicit or explicit purpose of improving the well-being of individuals or nations. Although there are many factors that affect well-being, including "accidental" factors such as natural resources and historical or geographic advantage, the basis of all social and economic well-being are the skills, attitudes and behaviors of people. The mathematical basis of calculating ELLI involves first isolating and estimating the component of the well-being of nations that depends on human contributions or human capital. This human component of well-being is the direct outcome of learning.

In order to isolate the human component of well-being from other accidental factors, a wide variety of social and economic outcomes are used. The rationale for taking a broad selection of outcomes is that, while some outcomes might also have a common dependence on specific factors such as natural resources, many outcomes are unlikely to have much in common besides human capital. For example, economic outcomes such as average income and unemployment tend to be related to the economic cycle in addition to human capital, but three diverse outcomes, such as average income, unemployment and self-perceived health, will most likely only share human capital as a common factor. ELLI ensures that the human capital component of well-being is properly estimated by using 19 separate economic and social outcome measures (Table 6). The estimate of the human capital component is produced using factor analysis, which combines the separate measures according to how much they depend on the common factor underlying the complete set of measures.

Once all the dimension scores have been produced, the final composite ELLI score is calculated by combining the four dimension scores. The contribution of the separate scores is determined by how well each model was able to predict the outcome. The purpose of this weighting is to ensure that, just as with the independent dimension scores, the overall ELLI has the best ability to predict the human contribution to social and economic well-being.

The analysis of indicators of social and economic outcomes used in both indices allows to determine the list of education and lifelong learning outcomes adapted to Ukrainian economic and social conditions. ELLI is more adapted to Ukrainian realities. However, individual indicators need explanations or changes in the definition. For example, the indicator "voted last European election" is not relevant for Ukraine (although it may be an indicator of attitude towards eurointegration). Gini coefficient for household income is the most popular indicator of economic inequality in the country. This indicator is important for Ukraine in the context of interrelation with access to education. A general list of indicators and measures of economic and social learning outcomes is presented in Table 7.

**Table 6.** Economic and social outcomes of learning

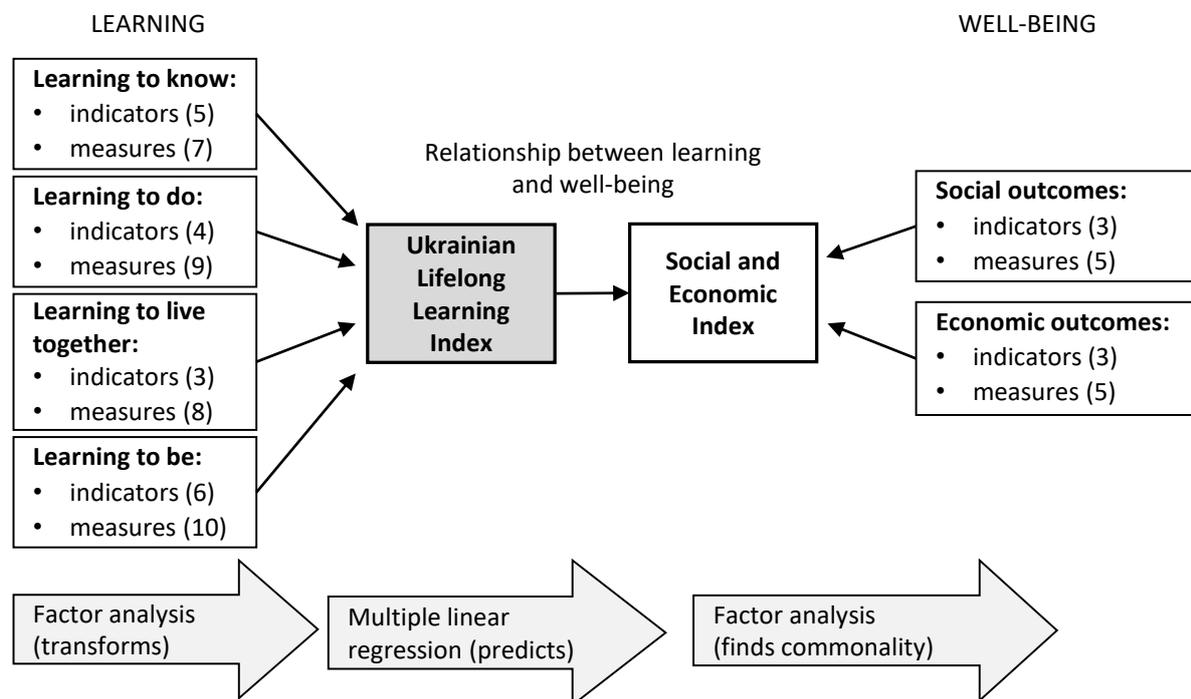
Source: Developed by the authors on the basis of Hoskins, Cartwright, and Schoof (2010).

Indicators	Measures
<b>Economic outcomes</b>	
Earnings/Income	Mean equivalized net income GDP per capita
Productivity	Labor productivity per person employed
Employment	Employment rate Unemployment rate
<b>Social outcomes</b>	
Health	Self-perceived health Self-reported conditions or health habits Life expectancy at birth
Life satisfaction/Happiness	Life satisfaction Happiness Satisfaction with job Satisfaction with home
Social cohesion and democracy	Long-term unemployment rate Gini coefficient Material deprivation rate by poverty status in the EU How satisfied with the way democracy works in country Voted last European election Trust in political institutions
Sustainability	Environmental Performance Index (EPI)

**Table 7.** Economic and social outcomes of learning in context of Ukrainian Lifelong Learning Index

Source: Developed by the authors on the basis of Hoskins, Cartwright, and Schoof (2010).

Indicators	Measures
<b>Economic outcomes</b>	
Earnings/Income	Mean equivalized net income GDP per capita
Productivity	Labor productivity per person employed
Employment	Employment rate Unemployment rate
Indicators	Measures
<b>Social outcomes</b>	
Health	Self-perceived health Self-reported conditions or health habits Life expectancy at birth
Life satisfaction/Happiness	Life satisfaction Happiness Satisfaction with job Satisfaction with home
Social cohesion and democracy	Long-term unemployment rate Gini coefficient Material deprivation rate by poverty status in the EU How satisfied with the way democracy works in country Trust in political institutions
Sustainability	Environmental Performance Index (EPI)



**Figure 1.** Model of Ukrainian Lifelong Learning Index calculation

Thus, the Ukrainian Lifelong Learning Index is presented in Figure 1.

In order to compile the Ukrainian Lifelong Learning Index in the context of individual regions, it is advisable to use the official data, which are regularly collected and published by the State Statistics Service of Ukraine, in particular (The statistical bulletin “Socio-economic situation of the region”). It should be noted that individual indicators and measurements are not presented in official statistics. To identify such indicators and measurements, it is expedient to conduct separate sociological surveys and involve relevant experts. It is important that the data collection tool is the same in all regions. Thus, every year, the data collection mechanism will be improved and the index of the region by region will become more accurate every year.

#### 4. DISCUSSION

In line with the European integration processes in Ukraine it is imperative to provide life-

long learning monitoring as a diagnostic tool that allows to assess the quality of education for children, youth and various categories of adults, visualize existing problems and identify their causes and solutions for local development management. It is all about the fact that scientifically based, complex, systematic collection and results of processing the received information are useful for the control of education quality as a whole, assessment of educational systems and their contribution to the development of the regional economy and the improvement of the process of making managerial decisions in the field of education. The analysis of the main components of the Composite Learning Index and European Lifelong Learning Index and proposed Ukrainian Lifelong Learning Index adapted to the Ukrainian education area and socio-economic realities are tools for monitoring the lifelong learning progress. In future, it is planned to calculate Ukrainian version of the Lifelong Learning index for individual regions and cities and to monitor its effectiveness.

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## APPENDIX A

**Table A1.** The dimension of learning to know

Source: Developed by the authors on the basis of the 2010 Composite Learning Index (2010) and Hoskins, Cartwright, and Schoof (2010).

Dimension	CLI		ELLI	
	Indicators	Measures	Indicators	Measures
Learning to know		–	Participation in early childhood / pre-school education	Percentage of children aged 4 to compulsory school age attending formal education institutions
	Youth literacy skills	Mean problem-solving scores for 15-year-olds	Output of secondary education	Student performance in reading (PISA) Student performance in math (PISA) Student performance in science (PISA)
		Mean reading scores for 15-year-olds		
		Mean math scores for 15-year-olds		
		Mean science scores for 15-year-olds		
	High-school dropout rate	Share of youth (20-24) who have not completed high school and are not attending school	–	
		–	Output of post-secondary education	Share of 30 to 34 years old with tertiary education
	PSE participation	Share of youth (20-24) who are participating in post-secondary	Participation in post-secondary education	Adult participation rates in formal education and training
	University attainment	Share of adults (25-64) who have completed a university program	–	
Access to learning institutions	Average travel time to elementary or secondary school	–		
	Average travel time to university or college	–		
	–	Supply of formal education infrastructure	Total public expenditure on education as % of gross national income	

**Table A2.** The dimension of learning to do

Source: Developed by the authors on the basis of the 2010 Composite Learning Index (2010) and Hoskins, Cartwright, and Schoof (2010).

Dimension	CLI		ELLI	
	Indicators	Measures	Indicators	Measures
Learning to do		–	Output of formal vocational education and training	Graduate quota in upper secondary education (vocational programs)
	Participation in job-related training	Share of adults (25-64) who participated in job-related training in previous year	Participation in non-formal vocational education and training	Participation of employees in CVT courses
		Share of adults (25-64) who participated in any form of job-related training during the last six years		
		–	Supply of non-formal vocational education and training Relative costs of CVT courses Enterprises providing any other form of training (non-CVT) Expenditure in training as part of labor market policies	Enterprises providing CVT course
	Access to vocational training	Average travel time to vocational schools, business and secretarial schools	–	–
		–	Integration of learning in the work environment Doing monotonous tasks at work Doing complex tasks at work Employees using internet for work	Learning new things at work
	Availability of workplace training	Share of employers who offer any type of classroom or workplace training for their employees	–	

**Table A3.** The dimension of learning to live together

Source: Developed by authors on the basis of the 2010 Composite Learning Index (2010) and Hoskins, Cartwright, and Schoof (2010).

Dimension	CLI		ELLI	
	Indicators	Measures	Indicators	Measures
Learning to live together	Participation in social clubs and other organizations	Share of households spending on social clubs and other organizations	Participation in active citizenship	Involvement in work for voluntary or charitable organizations
	Volunteering	Share of Canadians engaged in unpaid work as part of a group or organization		Inclusion in social networks
			Working in a political party or action group	
	Learning from other cultures	Share of Canadians who socialize with people from other cultures on a regular basis	Tolerance, trust and openness	Meetings with friends, relatives or colleagues
				Anyone to discuss personal matters with
	Access to community institutions	Average travel time to libraries	Trust in other people	Opinion that the country's cultural life is either enriched or undermined by immigrants
Average travel time to business, civic and social association				
	Average travel time to religious organizations		Opinion that gays and lesbians should be free to live their own lives as they wish	

**Table A4.** The dimension of learning to be

Source: Developed by the authors on the basis of the 2010 Composite Learning Index (2010) and Hoskins, Cartwright, and Schoof (2010).

Dimension	CLI		ELLI	
	Indicators	Measures	Indicators	Measures
Learning to be	Exposure to media	Share of households spending on internet services	Self-directed learning through media	Personal use of internet
		Share of households spending on reading material and other printed matter		
	Broadband internet access	Share of households with access to wireless, cable, and/or DSL	Supply of media for self-directed learning	Internet access in households
	Learning through culture	Share of households spending on admissions to museums and other cultural activities	Participation in learning through culture	Attendance at ballet, dance, opera
		Share of households spending on live performing arts		Attendance at ballet, dance, opera
				Attendance at cinema
				Attendance at concerts
				Visiting museums/galleries
Learning through sports	Share of households spending on recreation and sports facilities	Participation in sports and leisure activities	Participation in sports	
Access to cultural resources	Average travel time to museums and art galleries		–	
	–	Participation in continuing/ further education and training	Participation in lifelong learning	
	–	Work-life balance	Accordance of working hours with family commitments	