The "Learning Region" Concept as a Tool to Overcome the Digital Lag of the Russian Regions

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Abstract

The purpose of the research is to identify regional specifics of digital development and adapt the "learning region" model as a tool for overcoming the digital lag of Russian regions. The authors justified the feasibility of using the coefficients of the primary (availability of digital devices and digital infrastructure) and secondary (digital consumption and digital competencies) levels of digitalization to assess the regional digital development, as well as proposed a method for calculating them. Calculating the coefficients of primary and secondary levels of digitalization for 83 regions of Russia allowed the authors to identify regions with a digital lag (10 regions for the primary level of digitalization, as well as 49 regions for the secondary level of digitalization). The authors proved that the "learning region" concept could become a tool for increasing both primary and secondary levels of digitalization. Factors primary level of digitization form the basic conditions for the application of the "learning region" concept, and restrictions on secondary level of digitalization allow to overcome the digital lag of regions. The authors developed a model for using the potential of the "learning region" to overcome the digital lag. The article reveals the key relationships in the "learning region" concept, systematizes its elements, highlights the stages of the concept implementation, as well as offers a system of benchmarks for evaluating effectiveness. Research methods: theoretical analysis, comparative analysis, economic and statistical method, system approach.

Keywords

Learning region • Digital lag • Digitalization • Digital infrastructure • Digital consumption • Digital competencies

JEL Code

O33 • R11 • R58

1 Introduction

As digitalization processes develop around the world, corresponding changes are taking place within national economies and their regions. The forms of doing business are being transformed, the nature of the production technologies used is changing, as well as the tools for promoting goods and services and interacting with consumers are expanding. All of them are becoming more technological, operational, based on digital technologies and access to the Internet (Molchan et al., 2019).

The changes that are taking place are causing new forms of interregional inequality and digital divides to appear. Skolkovo researchers argue that the digital divide in Russian regions is more determined by the needs and requests of residents, as well as their digital skills and competencies than by the services and services of suppliers and providers (Skolkovo, 2020). A study on assessing the digital readiness of the Russian regions according to the Portulance Institute

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methodology showed that there is significant differentiation between Russian regions at the level of population, households, organizations in terms of access to and use of digital technologies, the digital literacy, and the volume of expenditures on financing the introduction of ICT and R&D, as well as 60% of the country's regions are characterized by digital lag (Bychkova et al., 2020; Institute, 2019).

In this situation, Russian regions are forced to adapt to new economic conditions determined by digital factors and find ways to overcome the digital lag. In this aspect, the "learning region" concept, which was previously proposed by the United Nations as a basis for sustainable development of territories, and which has proved its effectiveness in many European countries, can show its promise (Benner, 2003; Butko & Litvinova, 2014; Morgan, 1997). This concept, as a set of mechanisms that ensure a continuous process of universal education for the population of different ages, can have a high chance of success in terms of digitalization, since it intensifies the most productive resource of the economy—human capital.

The formation of professional competencies of the region's population and the development of their personal characteristics, which are in demand in the digital economy, can probably become the tool that will ensure overcoming the digital lag of Russian regions.

2 Theoretical Basis of the Research

The content of the "learning region" concept is associated with its competitiveness, achieved through the continuous integration of all regional subsystems and institutions on the basis of mutual learning (Benner, 2003; Hassink, 2007; Naiman, 2013). Porter (1990) and Storper (1993) focused on determining the effect on the economic system of the availability of a high-quality system of technological training in the region. Ohmae (1995) emphasized that the new growth poles are those regions where conditions for the development of a person, their knowledge, skills, and learning abilitiesare created. The point of view of Ohmae is shared by Florida (1995), which argues that regions, as knowledge generators, can use digital infrastructure to share knowledge and ideas, which creates the prerequisites for strengthening their own economic and technological role on a global scale. Morgan (1997) emphasizes the importance of solving regional development problems through interactive innovations and social capital, united by the network paradigm.

The characteristic features of a "learning region" are: the presence of a development strategy; cooperation of educational institutions, research centers, enterprises, and non-governmental organizations; development of joint solutions for obtaining new knowledge by the local community; high responsibility of educational organizations (Naiman, 2013; Stroev et al., 2007).

Practical experience in implementing the "learning region" concept belongs to Germany, where the "learning region" program was implemented. The European Commission did not stand aside, and its project on the formation of the European educational society (TELS) became fundamental in developing the institutional framework for the regional dimension of continuing education. The OECD (2001) applied the "learning region" concept to adapt to the changes brought about by the transition to a knowledge economy. The logical continuation of the "learning region" concept is the "Ideopolis" of Cannon, that is, the concept of forming a city where the economy develops by applying new ideas, generating knowledge, and exchanging ideas to produce innovations and improve production (Cannon et al., 2003).

However, in the digital economy, the "learning region" concept may take on a new meaning. The digital development of regions is uneven due to different levels of digital infrastructure formation and the use of digital technologies by all subjects of the regional economy, differentiation in the level of digital literacy, and, consequently, different opportunities for realizing the potential of the region's residents (Katz, 2017; Sabelnikova et al., 2018; Shvetsov, 2014; Skolkovo, 2019). In these conditions, effective tools to overcome the digital gap in the regions are needed.

The conceptual basis of this work was the research and publications of such scientists as: Karpunina et al. (2019, 2020), Asheim (1996).

Report on human development in the Russian Federation (2018), Federal state statistics service of the Russian Federation (2020), Index of digital literacy (ROCIT, 2017), and Digitalization in small and medium-sized cities in Russia (Higher school of urban studies, 2018) were also used in this article as a conceptual basis.

3 Methodology

The purpose of the research is to identify regional specifics of digital development and adapt the "learning region" model as a tool for overcoming the digital lag of Russian regions.

Research stages: (1) systematization of the problems of digital development in the Russian regions; (2) reflection of key relationships in the "learning region" concept, structuring its basic elements; (3) development of a model for using the potential of the "learning region" to overcome the digital lag.

Research methods: method of theoretical analysis, method of economic and statistical analysis, comparative analysis, system approach.

4 Results

The Higher school of urban studies (2018) identifies two levels of digitalization: the primary level of digitalization associated with the availability, quality, and accessibility of digital infrastructure; the secondary level of digitalization due to the presence of digital competencies in the use of digital infrastructure and services.

Selecting two levels of digitalization allows the authors to determine indicators for Russian regions (Table 1).

To assess the primary and secondary levels of digitalization of Russian regions, we will use the formula for calculating the digitalization level coefficient (K_d):

$Kd = \sum_{i=1}^{n} x_i * w_i$, where.

K_d—the digitalization level coefficient,

n—number of indicators,

x_i—the i-th indicator value,

w_i—the i-th indicator weight.

Indicators 1.1, 1.2, 2.1, 2.2 with corresponding weights are used to calculate the coefficient of the primary level of digitalization for Russian regions. The definition of the secondary level of digitalization is limited since official statistics do not contain the necessary indicators for evaluation. The authors use sub-indices of digital literacy assessment indices developed by specialized organizations for calculations (Skolkovo, 2018). The calculation of the secondary level of digitalization coefficient is based on indicators 3.1, 3.2, 4.1, 4.2 (Table 2).

The authors propose to estimate the gap between the regions of Russia using the range of variation of the coefficient of the primary level of digitalization. Range of variation = 30.3; Average = 80.9; Oscillation coefficient = 37.39.

Thus, if the value of the coefficient of the primary level of digitalization falls in the range of 61.2–76.35, then this region is lagging behind; if 76.35–91.5, then the region is leading. According to this method, 10 lagging regions were identified in Russia including Kostroma Oblast, Kurgan Oblast, Buryatia Republic, Zabaikalsky Oblast, Khakassia Republic, Irkutsk Oblast, Tomsk region, Sakha Republic (Yakutia), and Jewish Autonomous Oblast.

The range of variation of the coefficient of the secondary level of digitalization is 40.705. Average = 53.5. Oscillation coefficient = 76.09. Note that the gap between regions in the secondary level of digitalization is much higher. The range of values 35.18–55.53 includes regions that lag behind in terms of secondary digitalization (49 regions). Thirty four regions of Russia have a high level of secondary digitalization (the range of values is 55.53–75.88).

Thus, the results of calculations allow the authors to conclude that the level of digital infrastructure formation and provision of digital devices in the regions of Russia are generally satisfactory. On the contrary, the indicators of digital consumption and the formation of skills for using digital infrastructure and services in the regions of Russia are mostly unsatisfactory and require measures to improve.

The introduction of the concept of "learning region" in those territories where there is a strong lag in the average level of digitalization can become a tool for solving the current problem situation. At the same time, factors of the primary level of digitalization form the basic conditions for

Table 1 Indicators of development of Russian regions that reflect the levels of digitalization

Primary level of digitalization	Secondary level of digitalization
1 Security digital devices	*3. Digital consumption*
1.1 Percentage of households with a PC, %, 2019 (weight—20%)	3.1. Percentage of households shopping online, % (weight—20%)
1.2 Percentage of organizations that used PC in the total number of organizations surveyed(weight—20%)	3.2. Percentage of households receiving public services online, % (weight—20%)
2 Digital infrastructure	*4. Digital competencies*
2.1 Percentage of households with broadband Internet access, % (weight- 30%)	4.1. Specialized personnel (personnel with specialized education in the field of technology implementation and use; employed in the ICT sector) (weight—30%)
2.2 Organizations that had broadband Internet access, % of the total number(weight—30%)	4.2. Research competencies and technological background, including the level of R&D (innovation and research competencies confirmed by inventions and registered patents) (weight—30%)

Source Compiled by the authors according to Sabelnikova et al. (2018), Shvetsov (2014), Federal state statistics service of the Russian Federation (2019a, b)

Table 2 Calculation of primary and secondary levels of digitalization coefficients of Russian regions

Oblast	The coefficient of the primary level of digitalization	The coefficient of the secondary level of digitalization
Belgorod Oblast	81.0	65,887
Bryansk Oblast	78.2	41,524
Vladimir Oblast	80.3	54,397
Voronezh Oblast	83.3	58,863
Ivanovo Oblast	77.2	48,719
Kaluga Oblast	81.1	61,011
Kostroma Oblast	76.1	41,273
Kursk Oblast	78.0	61,855
Lipetsk Oblast	83.3	63,714
Moscow Oblast	84.6	72,251
Orel Oblast	77.3	40,605
Ryazan Oblast	78.5	48.49
Smolensk Oblast	81.3	50,912
Tambov Oblast	84.8	50,759
Tver Oblast	77.2	43,445
Tula Oblast	85.3	65,621
Yaroslavl Oblast	78.1	60,003
Moscow	90.1	71,121
Karelia Republic	82.3	45,243
Komi Republic	83.4	57,132
Arkhangelsk Oblast	79.6	55,207
Vologda Oblast	80.8	59,571
Kaliningrad Oblast	79.7	61,094
Leningrad Oblast	84.7	61,407
Murmansk Oblast	85.4	59,205
Novgorod Oblast	79.7	47,185
Pskov Oblast	78.0	40,383
Saint Petersburg	85.5	65,982
Adygea Republic	82.5	41,795
Kalmykia Republic	71.5	41,676
Crimea Republic	81.7	41,691
Krasnodar Oblast	80.4	58.32
Astrakhan Oblast	82.6	47,224
Volgograd Oblast	80.6	55,902
Rostov Oblast	83.6	63,302
Sevastopol	84.5	45,845
Dagestan Republic	61.2	37,553
Ingush Republic	80.9	39,635
Kabardino-Balkar Republic	77.7	44,198
Karachay-Cherkess Republic	76.9	40,299
North Ossetia-Alania Republic	77.8	39,801
Chechen Republic	69.3	41,337
Stavropol Oblast	79.5	49,641

(continued)

Table 2 (continued)

Oblast	The coefficient of the primary level of digitalization	The coefficient of the secondary level of digitalization
Bashkortostan Republic	83.0	61.53
Mari El Republic	78.0	45,066
Mordovia Republic	77.0	53,047
Tatarstan Republic	86.0	70,515
Udmurt Republic	80.7	58,454
Chuvash Republic	78.2	53,296
Perm Oblast	77.7	58,919
Kirov Oblast	78.7	48,338
Nizhny Novgorod Oblast	81.1	58,283
Orenburg Oblast	84.0	58,427
Penza Oblast	81.3	47,654
Samara Oblast	78.9	60,543
Saratov Oblast	80.0	54,313
Ulyanovsk Oblast	78.9	52,346
Kurgan Oblast	74.6	40,111
Sverdlovsk Oblast	80.6	56,032
Tyumen Oblast	85.9	71.03
Khanty-Mansi Autonomous district-Yugra	88.7	69,621
Yamalo-Nenets Autonomous district	91.5	75,883
Chelyabinsk Oblast	81.5	61.79
Altai Republic	84.6	55,097
Buryatia Republic	74.1	40,933
Tyva Republic	79.4	43,846
Khakassia Republic	73.1	44,671
Altai Oblast	76.9	51.46
Zabaikalsky Oblast	76.1	37,595
Krasnoyarsk Oblast	78.5	59,124
Irkutsk Oblast	74.9	55,264
Kemerovo Oblast	78.1	50,584
Novosibirsk Oblast	78.1	59,378
Omsk Oblast	79.5	52,811
Tomsk Oblast	74.4	55,568
Sakha The Republic (Yakutia)	72.7	59,577
Kamchatka Oblast	84.0	51,735
Primorsky Oblast	79.1	54,821
Khabarovsk Oblast	84.1	52,158
Amur Oblast	77.3	51.66
Magadan Oblast	83.0	39,705
Sakhalin Oblast	80.7	56.59
Jewish Autonomous Oblast	74.9	36,081
Chukotka Autonomous district	80.5	35,178

Source Compiled by the authors

implementing the "learning region" concept. Overcoming the limitations of the secondary level of digitalization allows to achieve the goals of implementing the "learning region" concept—overcoming the digital lag of the region, and, therefore, increasing the stability of development and ensuring the well-being of the region's population (Fig. 1).

The presented model opens up two ways to overcome the region's digital lag:

- Implementation of the policy of intensification of the primary level of digitalization in relation to regions with low indicators of the primary level of digitalization coefficient (expansion of digital infrastructure, broadband Internet access, Internet bandwidth).
- Implementation of the "learning region" concept—for regions that lag behind in terms of the secondary level of digitalization. This requires the following steps:
- Clarification of the educational needs of the regional economic system.
- Research of the potential of the scientific and educational complex of the region for the possibility of meeting existing educational needs.
- Determination of the directions of integration of educational institutions of various types.
- Creation of a unified information educational network.
- Cooperation between educational institutions, enterprises, non-profit organizations (Butko & Litvinova, 2014).

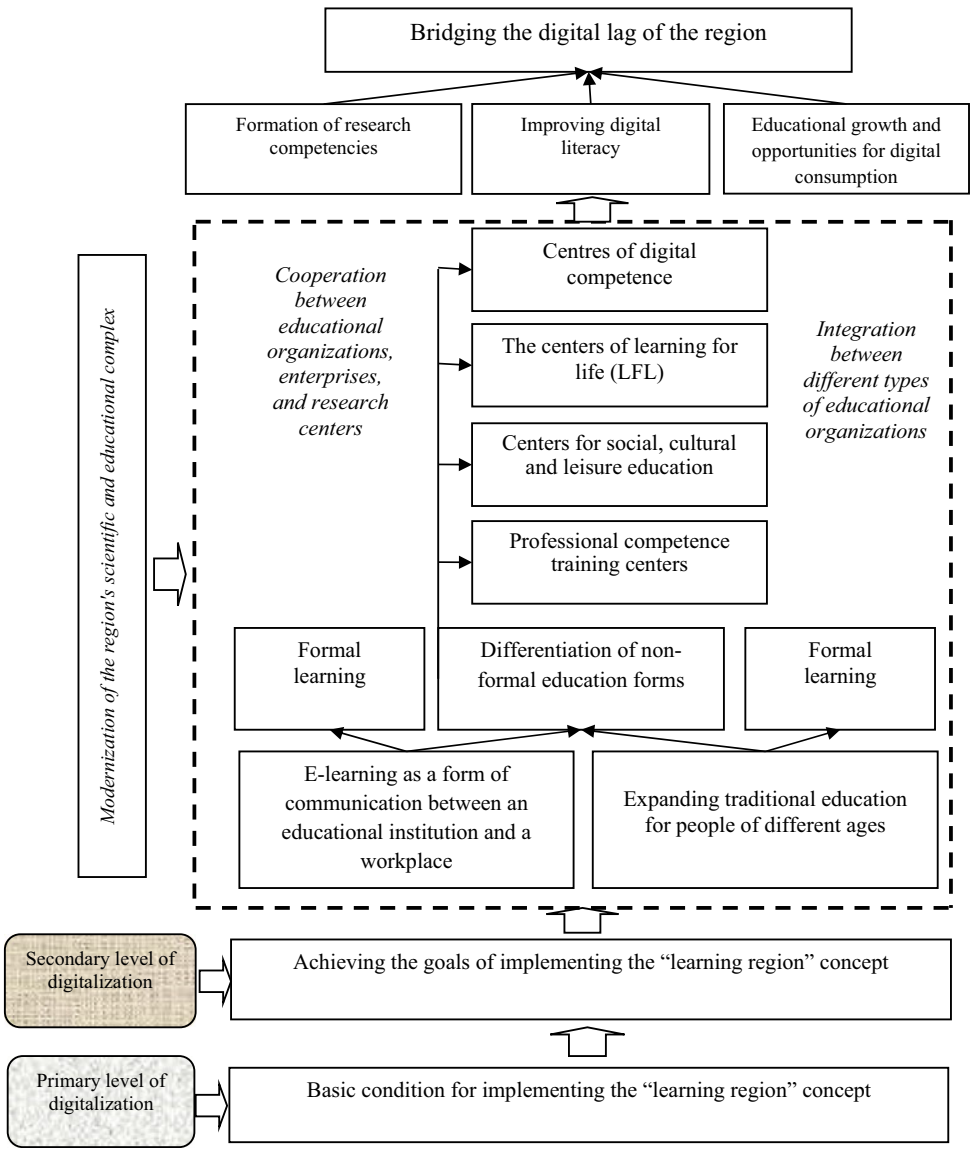

Fig. 1 Model of using the potential of a "learning region" to overcome the digital lag. *Source* Compiled by the authors

When the primary level of digitalization is satisfactory, that is, the region has a digital infrastructure, the Internet becomes a means of developing unified information and educational network to serve the interaction of partners and promote cooperation.

Benner (2003) emphasizes the importance of inter-firm communities of students under the management of professional associations and unions, which give "softness" to the emerging model of the "learning region" and its infrastructure. As the learning region model is put into practice, educational goals are supplemented by social interaction goals. At best, the learning region model will generate a formal infrastructure for developing the territory's network capabilities (for example, Silicon Valley).

Benchmarks for evaluating the implementation of the concept of a learning region can be: the creation of a unified information network for lifelong learning, cooperation between educational institutions, organizations, and industrial enterprises (expert assessment); Education index; digital literacy of the population; the number of employees conducting research, the number of advanced manufacturing technologies developed, the number of patents received (official statistics indicators).

5 Conclusions

The authors proved that there are two levels of digitalization in the region. The primary level of digitalization is related to the availability of digital devices and the availability of digital infrastructure in the region. The secondary level of digitalization is due to the population's ability to use digital infrastructure. The authors used a method for calculating the coefficients of primary and secondary levels of digitalization to determine regions with a digital lag. Calculations have shown that 10 Russian regions have problems at the primary level of digitalization, while 49 regions lag behind at the secondary level of digitalization. The authors suggested using the "learning region" concept in a territorial context as a tool for overcoming the digital lag between regions. The authors presented the key relationships in the "learning region" concept, and also structured its basic elements. The article suggests a model for using the potential of the "learning region" to overcome the digital lag, as well as a system of indicators for monitoring the process of its practical implementation.

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