

“Green” Logistics as an Instrument for Putting Together a New Model for Professional and Career-Broadening Training in Global Economic Space

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ABSTRACT

This paper looks into the key aspects of the shift in the instruction of logistics as a discipline from traditional to environmentally responsible practices. The authors examine the experience of the development of scientific-educational systems in the world's more advanced societies (the European Union and North America), as well as in the BRICS countries. The paper proposes specific ways to reform the model for professional and career-broadening education by reference to the amassed global experience. The authors draw the following major conclusions:

- both today's scientific and business communities are oriented toward the shift to environmentally responsible development, which presupposes gradually renouncing the use of hydrocarbon energy resources, embracing the use of renewable technology and recycling, and ensuring social stability;
- we are witnessing a change in the tenor of not only the strategic concept of the development of particular scientific and business areas but of the functional one as well. Thus, for instance, the domain of logistics services is currently being enriched with the concept of “green logistics”, which implies a need for relevant human resources specializing in the field. Many leading nations have already started transforming their education models, as a whole, and their methods for the instruction of logistics as a discipline, in particular, in specific alignment with the principles of environmental responsibility;
- the education systems of certain world powers, including the Russian model for education, have not yet been fully adapted for shifting to “green logistics”, one of today's latest scientific paradigms. Among the major reasons behind this delay is the failure to properly reform the scientific-educational sector, as well as the state's excessive, and rarely effective, participation in the development of this area. To help remediate this situation, the authors propose a set of recommendations aimed at helping to put together a new model for professional and career-broadening training in keeping with the latest scientific concepts and the needs of the labor market.

KEYWORDS

“green” logistics, environmental responsibility,
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European Union, North America

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1. Introduction

We are living in a unique time, one marked by not only a change of calendar cycle (one millennium ending, followed by another one beginning) but by that of historical era as well. Our current society no longer prioritizes a consumerist and utilitarian way of life, and the economy is already going through the process of getting transformed from industrial into post-industrial, changing its “color” from “brown” to “green” (Pearce, Markandya, & Barbier, 1997; Chapple, 2008; UNEP, 2011), which is having a natural impact on not only social-political and economic-technological processes but also those taking place in the area of education. And it goes without saying that in the new millennium the quality of education, as well as its completeness and relevance, is what is going to determine, in large part, the majority of global trends within the economic and social-welfare sectors.

Every national state, every country has a well-entrenched system of education of its own adapted to the needs of the labor market, which determines the level and specificity of demand for human (labor) resources (Busemeyer & Trampusch, 2012; Ashton & Green, 1996). The Russian system of education has gone through a number of key stages in its development (from the formation of the research and methodology basis in the first quarter of the 20th century to structural transformations witnessed in the first half-decade of the 21st century). The major changes characterizing each of these stages have not always been fully embraced by the wider general public, with the trend continuing today.

Note that quite often reforms in the Russian education sector do not harmonize with the experience of the world’s most advanced societies, and sometimes even contradict it in many respects. And, despite the fact that Russia’s current efforts related to the transformation and modernization of the areas of higher education and science are aimed, on the one hand, at putting together a new institutional space and, on the other, at changing society’s attitude toward the essence and purpose of the scientific-educational domain, its current scientific-educational domain does not appear to be open to change, and is, actually, not really prepared for it (Dunleavy, 2014).

This is specifically due to the fact that instrumental and methodological support for educational processes (above all, in the area of higher education) is, for the most part, morally outmoded, while the instruction of many disciplines is not complemented by the latest scientific concepts and paradigms. This well applies to the instruction of logistics as a discipline or a subject. At present, the Russian scientific and educational environment is characterized by confining logistics (as a type of economic activity) exclusively to services related to transportation/freight forwarding and warehousing. This finds reflection in the nation’s current conceptual approaches to the instruction of this discipline characterized by a methodologically restricted treatment of logistics, which leaves the labor market with a lack of specialists with the right competencies in place. What is more, experienced specialists find themselves out of a position to enhance their career and develop their competencies further, which is due to the fact that the domain of career-broadening education simply lacks new educational programs aimed at helping you master new approaches to management in logistics.

2. Materials and Methods

This paper conducts a content analysis of publicly available sources and a comparative analysis of scientific and scientific-publicistic works to explore the tenability of the hypothesis that the domain of higher education ought to be open to change and reflect in many ways the latest social and economic-technological trends so as to ensure that newly turned-out specialists possess all the right competencies and relevant knowledge necessary to engage in professional activity under present-day conditions. Methodologically, the paper incorporates sets of new (Fahimnia, Bell, Hensher, & Sarkis, 2015; Dyckhoff, Lackes, & Reese, 2013) and traditional (Bowersox, Closs, & Helfferish, 1986; Coyle, Bardi, & Langley, 1992) approaches to construing the essence and content of the concepts of “logistics” and “green logistics” (both as a type of economic activity and as a scientific discipline).

3. Results

The Soviet system of higher learning has given the world many great scientists, including Nobel Prize winners (Lev Landau, Petr Kapitsa, Leonid Kantorovich, Zhores Alferov, Konstantin Novoselov, and many others). It goes without saying that Soviet higher education was among the more efficient globally, but at the same time the entire Soviet system of education was tailored to, mainly, suit the needs of the military-industrial complex and expected to consistently replenish the nation’s reserves of human resources engaged within the system of state security to help administer military order within the nation and ensure its working capacity. On the whole, the bulk of the Soviet social-economic system was militarily oriented. This is why the launch of market reform in the 1990s also triggered the transformation of the entire system of education, leading at some point to certain structural disproportions. Thus, for instance, permission to put into effect a private-entrepreneurship initiative in the field of education led to a nearly two-fold increase in the number of institutions of higher learning between 1990 and 2000 (Figure 1). However, the deepening recession trend in the Russian economy then led to a decline in this number in 2015, reducing it to the 1990 level. An important role in this process has been played by optimization processes involving the enlargement of state-run colleges via forced mergers and acquisitions.

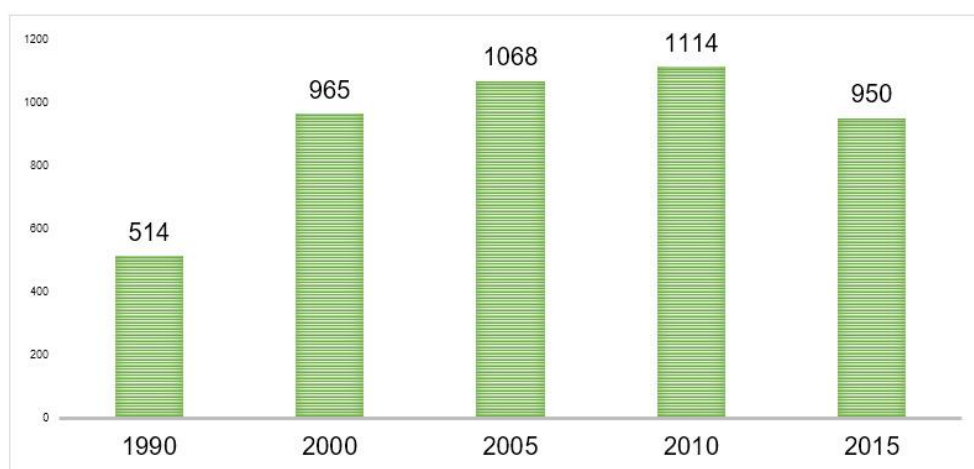


Figure 1. Change in the number of colleges within the Russian system of education in the period 1990 to 2015 inclusive. (Russian Federal State Statistics Service, 2016)

To note, the relative weight of state-run (public) colleges in the overall number of all colleges in Russia ranged between 1990 and 2015 from 100% to 55.8% (Figure 2).

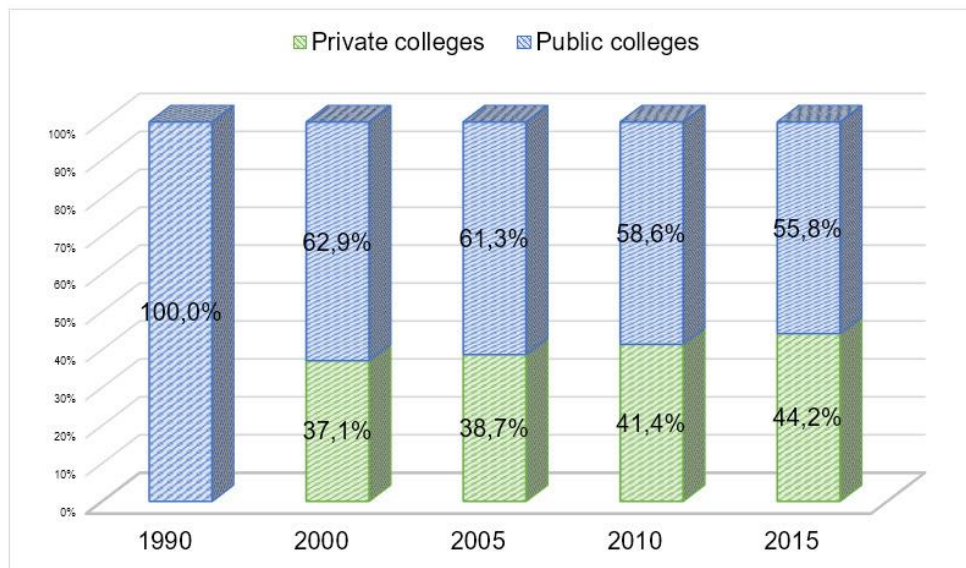


Figure 2. Change in the ratio of private to public colleges in Russia in the period 1990 to 2015 inclusive. (Russian Federal State Statistics Service, 2016)

This evidences that the segment of public education has been shrinking at an outperforming rate. That said, the public segment appears to, actually, dominate the domain of secondary vocational training (training for blue and white-collar workers), the number of related academic institutions showing an increase over the last 5 years (Figures 3 and 4).

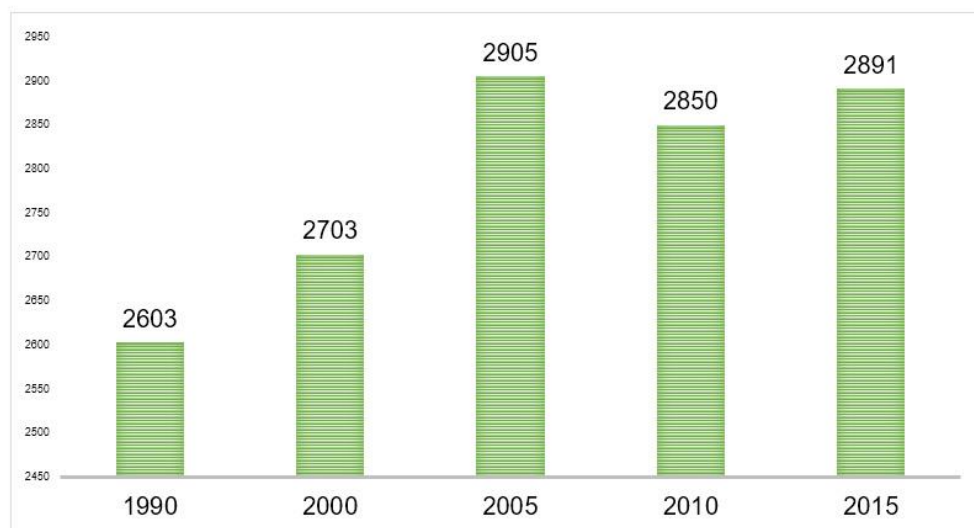


Figure 3. Change in the number of institutions of secondary vocational learning in Russia in the period 1990 to 2015 inclusive. (Russian Federal State Statistics Service, 2016)

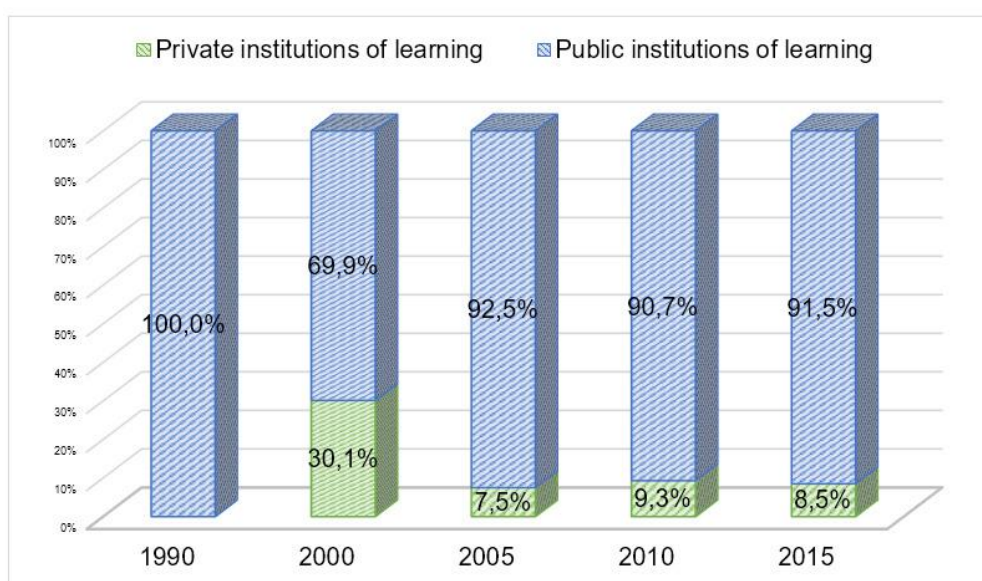


Figure 4. Change in the ratio of private to public institutions of secondary vocational learning in Russia in the period 1990 to 2015 inclusive. (Russian Federal State Statistics Service, 2016)

In point of fact, secondary vocational education in Russia became diversified, from an organizational-legal standpoint, only in 2000. The private educational segment is oriented toward the development of higher education, whereas the state, understandably, needs blue and white-collar workers and is therefore oriented mainly toward the development of the system of secondary vocational education. This significant structural disproportion is fraught with a further

aggravation of recessionary trends within the Russian system of education, an inference corroborated by data from specific international rankings reflecting the development level of national systems of higher education. At present, the Russian Federation is placed 36th in the world education rankings, behind not only Australia, Norway, and the US, as countries ranked in the top 10, but nations whose economic and social development is not too different from Russia's, like Belarus, Ukraine, or Argentina (Figure 5).

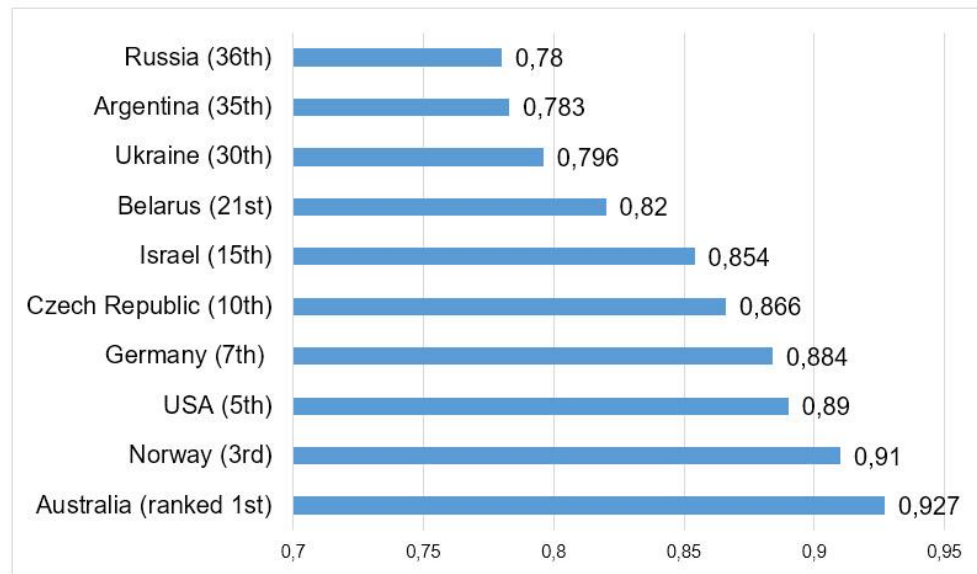
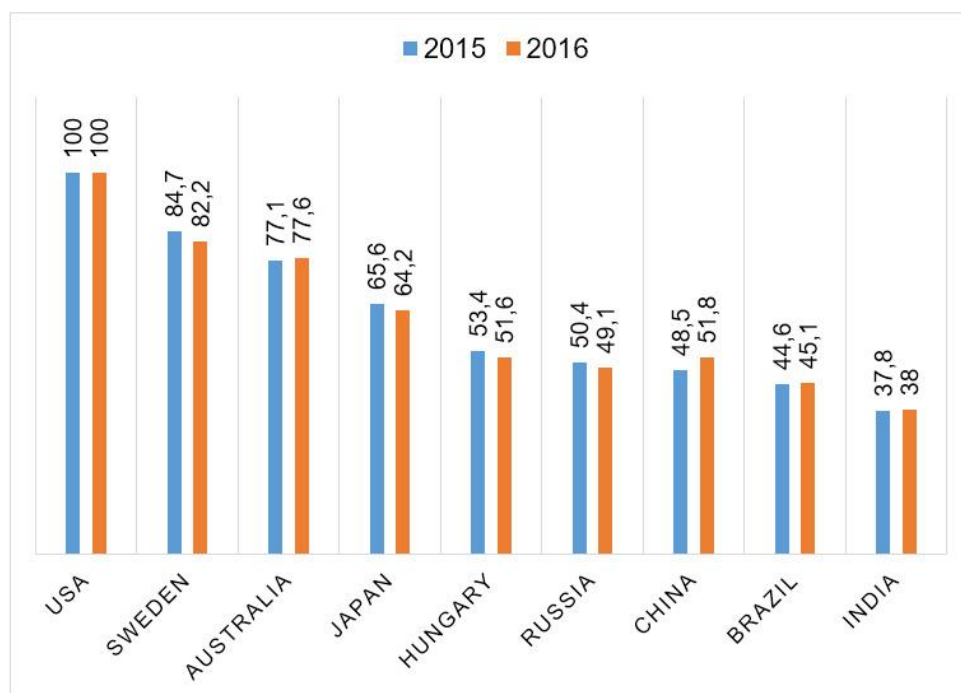


Figure 5. Sampled ranking of countries by education level (as of 2013). (Tsentr Gumanitarnykh Tekhnologii, 2016a)

In the rankings of national systems of higher education, the Russian Federation has steadily ranked 33rd–34th among a total of 50 nations. Relative to the general rankings, illustrated in Figure 5, Russia's position appears to be not very strong, the general rankings including 187 countries. The change in Russia's position in the rankings of national systems of higher education is illustrated in Figure 6.



Figures 6. Sampled ranking of the world's national systems of higher education. (Tsentr Gumanitarnykh Tekhnologii, 2016b; QS Top Universities, 2016)

We can see that in the “university rankings” Russia is even behind Hungary (the least developed country within the European Union), and, what is more, in 2016 Russia is also behind China in the rankings. It is worth taking a close look at the rankings’ score components; there are 4 of these components, and they are structured in the following way:

- resources (investment in private and public education; the component’s weight is 25%);
- results (scientific research and publications; the degree to which education matches the needs of the labor market; 40%);
- ties (the degree of openness of the system of higher education; 10%);
- environs (state policy, the accessibility of education; 25%).

The reasons behind Russia’s low score in the world higher education ratings are pretty obvious: a decline in investment in the system of higher education on the part of both the private and public sector, contrasting with a rise in military spending. This affects the values of both the results indicator and the one related to ties with other systems of higher education. Thus, for instance, if in the period 2012 to 2015 there were nearly 40,000 scholarly papers on “green logistics” in English available to be cited from the Google Scholar database, there were just 800 papers of this kind published in Russian. And this signals



that the Russian system of higher education is not fully ready yet to integrate into the global scientific environment. This also explains Russia's lack of innovative concepts in relation to the instruction of logistics as a scientific discipline.

In countries whose economy can already be regarded as post-industrial or innovation-based, budget expenditure on education is also not too high, although they tend to utilize quite a variety of instruments for funding the scientific-educational domain, some of which are examined below:

- the US employs partnership-based forms of funding education, whereby state funding is complemented by private funding and is oriented toward a specific result. This result implies the provision of citizens with training aimed at getting a decent, well-paying job and, consequently, the recoupment of the initial investment in training through labor productivity;
- Great Britain utilizes cooperative forms of funding education, which are also oriented toward a result, allowing you to assess the effectiveness of educational programs (the faster the student gets a job, the more effective the program is considered to be and the faster you see a return on an investment in educational programs);
- certain European countries (e.g., Belgium, France, and Austria) employ slightly different approaches to funding education: sureties, grants, and similar models for target funding guaranteeing anyone an education via public or private funding (most private funding provided by employers).

It is worth noting that in terms of the degree of development of the system of general and higher education Russia is considerably behind its BRICS partners, most notably China. Based on the 2013-2014 QS rankings, the first three spots were awarded to Chinese universities (Peking University, Qinghua University, and Fudan University). Russia's highest-placed university, Lomonosov Moscow State University, placed 4th. In the period under review, the institution, also, saw its standing dip in the overall world rankings (Table 1).

Table 1. Top universities within the BRICS coalition. (QS Top Universities, 2016)

University	2012/2013		2013/2014	
	BRICS rankings	world rankings	BRICS rankings	world rankings
Peking University	1 st	44 th	1 st	46 th
Qinghua University	2 nd	48 th	2 nd	48 th
Fudan University	3 rd	90 th	3 rd	88 th
Lomonosov Moscow State University	4 th	116 th	4 th	120 th
Shanghai Jiao Tong University	5 th	125 th	5 th	123 rd
University of São Paulo	6 th	139 th	6 th	127 th
University of Cape Town	7 th	154 th	7 th	145 th
Zhejiang University	8 th	170 th	8 th	165 th
University of Science and	9 th	186 th	9 th	174 th

Technology of China				
Nanjing University	10 th	168 th	10 th	175 th

If we examine the 2015-2016 world university rankings, we can see that the positions of Chinese universities have improved even further, with Peking University ranking 41st, Qinghua University and Fudan University 25th and 51st respectively, and University of Science and Technology of China and Nanjing University 113th and 130th respectively (QS Top Universities, 2016).

Among the Russian universities gaining ground on the world's top 100 universities is, again, Lomonosov Moscow State University, ranked 108th, followed by the nation's second top-performing university, Saint Petersburg State University (just 256th), and then its third, Novosibirsk State University (317th) (QS Top Universities, 2016). It is also worth noting that the BRICS countries, including Russia, have rather too little sway over what is going on in the global scientific environment, which makes it difficult to carry into action a variety of effective and relevant educational projects, including those related to the formation of the new scientific paradigm "green logistics".

4. Discussion

"Green logistics" is a logical functional continuation of the general strategic concept of "green economy", which is currently taking over for the scientific-practical paradigm "sustainable development" (Fahimnia et al., 2015; Malhotra, 2001; Maloni, Carter, Kaufmann, & Rogers, 2015; Bolumole, Closs, & Rodammer, 2015). The concepts of "green logistics" and "green economy" are viewed as two key conditions for the physical preservation of modern civilization to be possible. The main idea here is that resource-wasting and energy-intensive models for nations' social-economic development ought to be replaced with low-carbon and resource-saving models. This will help to not only reduce the already accumulated environmental damage but also restore some of the natural capital lost in previous centuries.

Ecologization is all the more crucial to the development of Russia's economy also because the bulk of its national revenue derives from the excessive use of natural resource rent.

One should not deny the fact that the Russian economy is a rent-based economy. But one should also consider the fact that Norway's economy is rent-based too, and the nation is placed 12th in the world higher education rankings, as opposed to Russia ranking just 34th (2016) (Tsentr Gumanitarnykh Tekhnologii, 2016b). This means that Norway uses its natural resource rent intensively to generate gains in human capital, while in Russia it is used extensively and for different purposes and objectives.

Both the federal government and the Russian Academy of Sciences have spoken a lot over the last 2–3 years about the need for a conceptual shift in the instruction of logistics as a scientific discipline from a resource-wasting scenario to a resource-saving and low-carbon one. However, a shift like that has yet to come to pass in Russia, there being a number of specific reasons behind that:

- firstly, the nation has yet to amass a theoretical and empirical base for environmentally responsible logistics (both as a scientific discipline and a type of economic activity);
- secondly, Russia lacks scientific-research institutes which would be engaged, along with instruction, in the development of the scientific and scientific-methodological foundations of “green logistics”, including those related to ensuring the progress of educational processes (an exception being the International Center for Training in Logistics at the Higher School of Economics national research university);
- thirdly, Russia’s current system of career-broadening education appears to be fragmentary, for the most part, and has so far failed to properly implement the concept of life-long learning.

Below are some of the key scientific-methodological tenets that ought to be focused on if the nation is to succeed in developing its professional concepts in “green logistics” as a discipline:

- 1) the underlying idea, essence, use, goals and objectives of the shift from a resource-wasting scenario for the operation of the economy and the social-welfare sector to an environmentally responsible one;
- 2) the place of “green” (environmentally safe) technology within the resource-saving and resource-effective model for national social-economic development;
- 3) key theoretical, methodological, and practice-oriented approaches aimed at minimizing logistical costs, as well as production losses, and reducing energy intensity and environmental impact within the industrial sector;
- 4) the interrelationship between the concepts of “social” and “environmental responsibility” and logistics as a scientific discipline and a type of economic activity, as well as the logistical functionality of systems for managing enterprises, organizations, and companies.

These tenets ought to be integrated both into the system of higher education and into that of vocational education as a subsystem of the national education system. In addition, the nation may want to introduce already now a course of theoretical-methodological and practical lectures on reverse logistics.

Reverse logistics can be viewed as a “green” logistics technology oriented toward collecting from retail outlets (i.e., the distribution domain featuring commerce and services), as well as from consumers (the consumption domain), products that are no longer in use, defective, or damaged and things like empties and transportation packaging, which can then be recycled by way of secondary or tertiary processing (Fahimnia et al., 2015; Dyckhoff et al., 2013; Dudin & Frolova, 2015).

Reverse logistics is also an element in fostering client-orientedness in serving the end consumer. Such practices can boost consumer interest in a product created and transported using “green” production and logistics technology, for reverse logistics is oriented toward not just the second-hand or third-hand use of

products that have undergone recycling but also their sale in special stores at lower prices.

While it was a common practice in the past to just destroy products no longer in use as garbage or take them to a landfill site (landfill sites being a major problem in Russia due to the lack of garbage-processing plants, compared with the EU and North America), today reverse logistics helps recycle such products and create reverse logistical flows (from the consumer, through the manufacturer, to the resource supplier), which helps reduce costs related to logistics, and other costs, and minimize environmental impact. This is why it is objectively necessary to institute reverse logistics as a course in the curricula of schools offering career-broadening learning and human resource training and retraining.

It also pays to draw on the experience of the EU and North America, where educational programs related to environmentally responsible logistics are combined with practical programs on the ecologization of national transportation-logistics domains and this combination is realized directly through business establishments bringing forward demand for human resources with relevant competencies related to the use of “green logistics” technology. Best practice indicates that business establishments aspiring to boost their competitiveness via an environmentally responsible logistics approach (companies like these are already operating in the Russian economy, although most of them hail from either Europe or North America) are mostly interested in specialists competent in the following areas of knowledge:

- the use of environmentally safe means of transportation, which also presupposes knowledge and skills related to retooling transportation vehicles to get them to work on special types of engines and fuel;
- the shift to environmentally safe technology related to organizing the movement of freight, which presupposes knowledge of intermodal transportation and integration and elimination of freight traffic;
- the implementation of environmentally safe technology related to the processing and storage of freight, which also presupposes knowledge of reverse logistics;
- the shift to “green” partnership between the state sector, the business sector (including competitors and clients), and the scientific-educational sector.

Research indicates that, as part of their educational practices, the world’s more socially and economically advanced nations are constantly engaged in the development and implementation of scientific approaches in the area of environmentally responsible logistics, which is done in keeping with the needs of the real sector of the economy. This enables the countries of the EU and North America retain the leader positions not just in the economic and social domain but in the scientific-educational one as well. The BRICS countries, and, above all, Russia, ought to implement more actively these achievements both scientifically and practically, with Russia possessing the most robust and accredited potential among the BRICS states, which can be also utilized for

enhancing the national model for professional and career-broadening education in “green logistics”.

5. Conclusion

Thus, Russia’s system of education, with its considerable scientific potential, has a really good opportunity to reach top positions, even though the current condition of its scientific-educational environment is still far from perfect.

There is a need to modernize existing approaches to the instruction of many scientific disciplines, including logistics. But the real problem is that too few of the latest conceptual approaches, forming the scientific paradigm of the future, ever find reflection in the nation’s educational processes.

Very little attention is devoted to the concept of “green economy”, while there is also a lack of proper scientific theoretical-methodological and didactic instrumentarium for promoting the concept of “green logistics”. Having said that, it is worth noting that the Russian scientific-educational domain does, actually, possess the necessary preconditions for the enhancement of the nation’s model for professional and career-broadening education:

- Russians can now pursue an advanced study of logistics at the International Center for Training in Logistics, running under the Higher School of Economics national research university;
- at the state level, there is a clear awareness of the need to better conserve the environment and minimize environmental impact;
- business establishments are interested in bringing in human resources possessing solid professional competencies in “green (environmentally responsible) logistics”.

The authors are convinced that, by relying on the experience of the world’s more developed nations, it is perfectly possible to reform and optimize the national system of education factoring in “green logistics”, as an environmental scientific paradigm and a new dimension in economic activity. The effective training of professional human resources requires harmonizing to each other all the subsystems of national education, including general, vocational, and higher, as well as career broadening, education. It will certainly pay to start resolving this issue right away, including through the development of scientific ties and exchange of experience with the world’s top universities.

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