

# Smart Education 4.0: Balancing Dual-Distance and Reskilling Revolution

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## ABSTRACT

On January 22, 2020, in Davos, the World Economic Forum launched Reskilling Revolution, a multistakeholder initiative aimed at providing better education, new skills, and better jobs for a billion people worldwide by 2030, so questions about improving the quality of education by introducing dual distance education and retraining of personnel at enterprises are becoming more and more relevant. In the course of the study, the authors analyzed the current problems of universities and enterprises, which allowed them to propose the creation of a smart cluster. The authors demonstrated the interaction of cluster participants using the example of education. The study showed that it is with such a tool that it is possible to solve the current problems of the participants, and in general, to improve the quality of education, the well-being of the region and, as a result, when scaling up, the well-being of the country and its image and culture on the world stage. The study showed that only through joint efforts and cooperation between universities, employers, research institutes and the state, it is possible not only to improve the quality of education but also to provide enterprises with a qualified workforce on a permanent rotation basis than to increase the competitiveness of business. This will allow research institutes and universities to raise funding, which can be directed not only to maintaining the current state but also to the development and introduction of resource-saving technologies, which we see as further research methods.

**Keywords:** Dual-distance; Education; Reskilling revolution; Smart.

**JEL Classification:** M53, M51, P36

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# Educación Inteligente 4.0: Equilibrio entre la Revolución de la Doble Distancia y la Recapacitación

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## RESUMEN

El 22 de enero de 2020, en Davos, el Foro Económico Mundial lanzó Reskilling Revolution, una iniciativa de múltiples partes interesadas cuyo objetivo es proporcionar una mejor educación, nuevas habilidades y mejores empleos a mil millones de personas en todo el mundo para 2030, por lo que las cuestiones sobre la mejora de la calidad de la educación mediante la introducción de la educación dual a distancia y el reciclaje del personal en las empresas son cada vez más relevantes. En el transcurso del estudio, los autores analizaron los problemas actuales de las universidades y las empresas, lo que les permitió proponer la creación de un clúster inteligente. Los autores demostraron la interacción de los participantes en el clúster utilizando el ejemplo de la educación. El estudio demostró que con esta herramienta es posible resolver los problemas actuales de los participantes y, en general, mejorar la calidad de la educación, el bienestar de la región y, en consecuencia, al ampliarla, el bienestar del país y su imagen y cultura en el escenario mundial. El estudio demostró que sólo a través de los esfuerzos conjuntos y la cooperación entre las universidades, los empresarios, los institutos de investigación y el Estado, es posible no sólo mejorar la calidad de la educación, sino también proporcionar a las empresas una mano de obra cualificada en una base de rotación permanente que aumentará la competitividad de las empresas. Esto permitirá a los institutos de investigación y a las universidades obtener financiación, que podrá destinarse no sólo a mantener el estado actual, sino también al desarrollo y la introducción de tecnologías que ahorren recursos, lo que consideramos otros métodos de investigación.

**Palabras clave:** Dualidad; Educación; Revolución de la recualificación; Inteligente.

**Clasificación JEL:** M53, M51, P36

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## 1. Introduction

The current state of society after the World Economic Forum in 2016 began to be called the era of the Fourth Industrial Revolution, the scale and complexity of the transformation of which will be fundamentally new, unfamiliar to humanity. The response to this challenge must be integrated and comprehensive, involving all actors: from the public and private sectors to academia and civil society.

Under such conditions, the issues of the essence and form of integration of Ukrainian society into the new era, the use of opportunities and the prevention of risks posed by the Fourth Industrial Revolution become relevant. On the one hand, Ukraine can take advantage of the new way of life, eliminate existing shortcomings; on the other hand, the turbulence and riskiness of the new way of life require a new - safe management of this process, one aspect of which is education, namely highly qualified personnel who will have to learn and retrain all my life.

This study is a continuation of the long-term research of the authors [1-5] and is devoted to finding tools to provide the company with qualified personnel through the improvement of education and retraining.

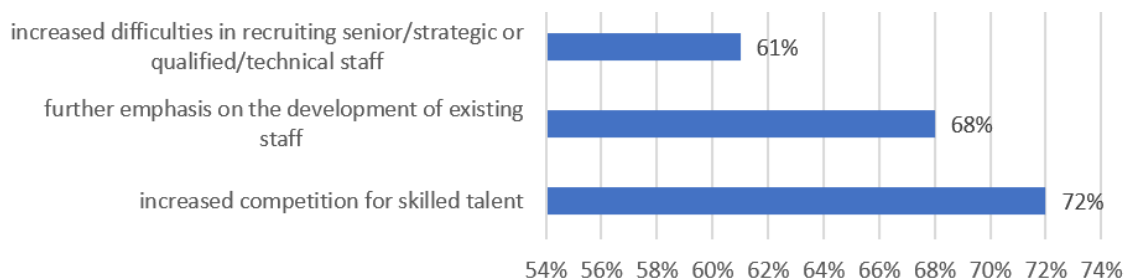
## 2. Literature review

On January 22, 2020, in Davos, the World Economic Forum launched Reskilling Revolution, a multistakeholder initiative aimed at providing better education, new skills and better jobs for a billion people worldwide by 2030 [6]. Ukrainian scientists have been dealing with the quality of education for a long time, especially during the last decade, and from absolutely different sides: institutional aspects [7-8]; the relationship between science, education and business [9-11]; technical aspects in the search for ways to improve personnel training [12-14]; innovative aspects affecting digitalization and innovation of society [3; 15-18] and so on. However, the reality is changing so quickly that many of the tools printed in the book become outdated even before its release.

Businesses face increasing competition for talented people and are increasingly recognizing that the skills needed to work in their organizations are changing. When it comes to views on the labour market, business leaders agree that competition for highly qualified personnel increases [2].

Recent studies show that expected changes include increased competition for skilled workers, the development of existing staff, and difficulties in recruiting senior and skilled workers - the most expected changes in the next three years (Fig. 1).

**Figure 1.** The most expected changes in personnel in the next three years (source: compiled by the authors based on [2; 5; 16])



Enterprise management also provides for an increase in communication with employees on strategy (51%), opportunities to listen to employees (50%) and difficulties in selecting operational staff (40%). Organizations have different views on the diversity of recruits, 14% expect a decrease, but almost a third (31%) expect an increase in diversity over the same period, and larger organizations are more likely to expect this [2; 15; 17].

Thus, it proves that personnel issues have already become one of the most critical issues in the effective functioning of the enterprise, and with the advent of CPR, they will become even more acute. Thus, now companies that want to be leaders in the industry need to move to a meaningful attitude to recruitment, training, work and retraining.

The Atlas of New Professions [19] notes two main trends:

a) distance focus.

Distance also no longer plays a role - courses of many prestigious universities can already be listened to online from anywhere in the world. In the future, distance schools and universities will become an equal alternative to traditional full-time education, and “e-tutors” will oversee the educational process and help students master the program. Playful forms of learning will be used more and more often since the game allows you to master the subject being studied more effectively.

b) dual (practice-oriented) orientation.

The world is changing so quickly that we can no longer afford to study theoretical disciplines for five years and then master the profession for some time at the employer's expense. Therefore, education, especially for university students and adults, is becoming more subject and practice-oriented. This means that the emphasis is shifting from theory to real projects of students, including their start-ups. In addition, forms are being developed in which a student can study and work simultaneously.

Thus, the theoretical and analytical base proves the relevance and necessity of this proves the relevance of research.

### **3. Balancing Dual-Distance**

Today, the world has changed; the speed of change and the level of uncertainty have grown so much that few companies can tell what kind of specialists they will need even in ten years, let alone more distant horizons. At the same time, we see that narrow-profile specialists are gradually leaving because the technologies to which their skills are tied are changing too quickly. Now people are in demand who understand several industries at once and can transfer knowledge and technological solutions from one sector to another. For example, 3D printing approaches, originally developed for rapid prototyping, were later carried over by professionals to other industries: printing buildings, medicines, human organs, and food. Today's schoolchildren will enter the economy in five to seven years. The world will change significantly during this time. Expecting to become a manager, lawyer, economist, PR specialist or even a programmer, the student is guided by success in today's realities, but other specialists will be needed in the future. An illustration of this is the disappointment of many young people who went to get higher education, relying on the current statistics of the demand for professions. After five or six years, they realized that they were wrong [20].

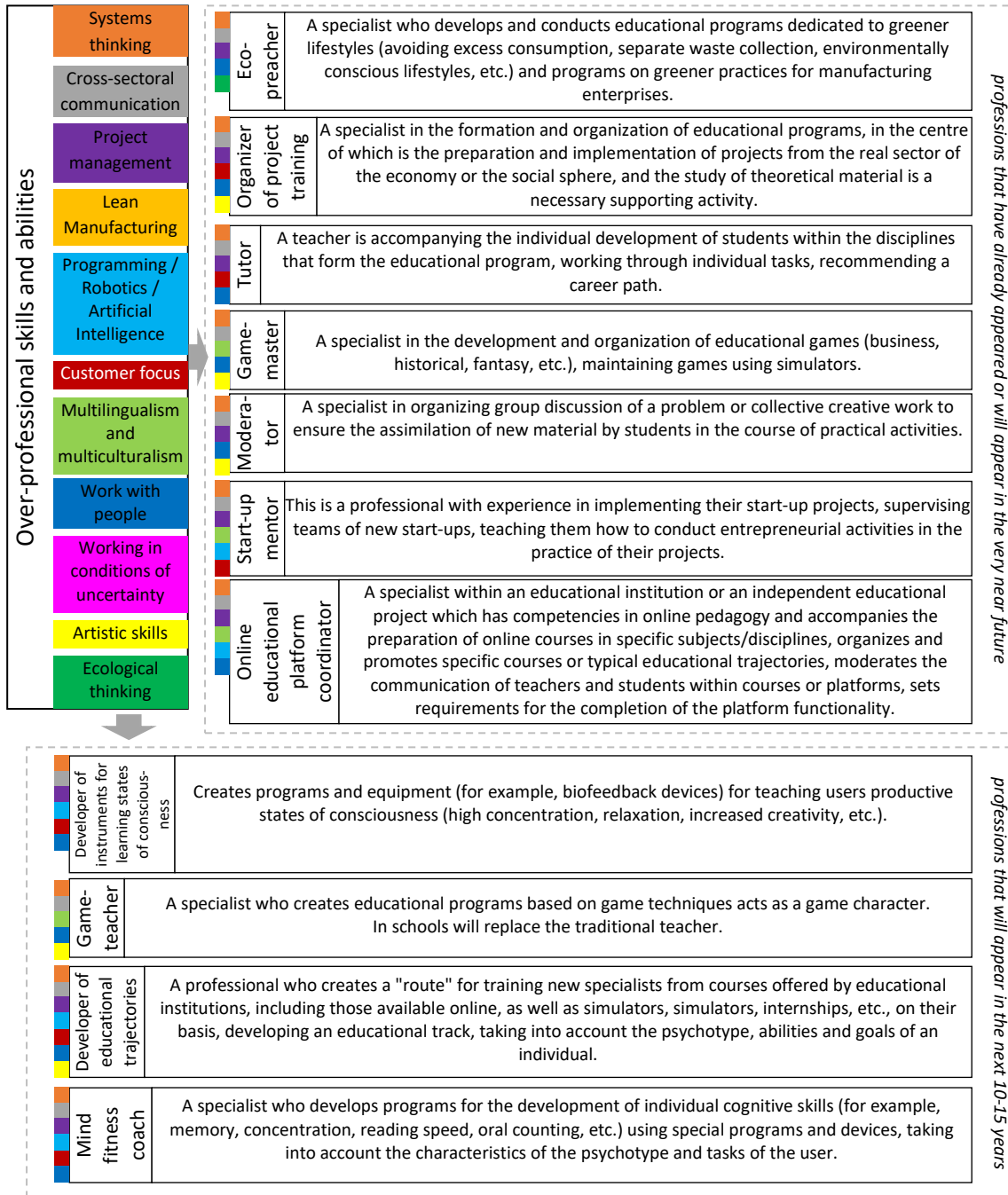
Education is traditionally considered a very conservative area, but the development of technology is changing our understanding of acquiring knowledge and forcing us to rethink the usual approach to the educational process seriously. This means that education specialists will be in great demand in the future.

Many scientists and practitioners predict that there will be absolutely new professions in education in the near future, caused to a greater extent by the digitalization of society (Fig. 2).

It is worth noting that the first three skills – Systems thinking, Cross-sectoral communication and Project management – will be required in absolutely all new professions.

The main problem of modern Ukrainian education is precise that while saving the budget, the university is shifting the newly emerging responsibilities onto each teacher. As a result, the emphasis is leaving the quality of the taught material (reducing the time spent preparing materials for lectures and practical classes, and so on) to those areas in which many teachers do not have competencies, soft skills and others. As a result, the expansion of the teacher's duties does not lead to better performance.

**Figure 2.** New professions in education (source: compiled by the authors based on [19; 20])



Note: the colored square corresponds to the color from the general list of skills and shows what exactly the given employee should have

This leads to the following problem: teachers must improve their skills and knowledge; however, firstly, many universities do not allocate additional funds for this, and those advanced training courses that really improve skills are so expensive that teachers are not able to pay them at the expense of their salaries; secondly, teachers do not have enough time for high-quality mastering of the material; there is a need to free up time from training sessions. One of the ways to solve this problem is to allocate, for example, from 2 weeks to 1 month for the teacher to complete advanced training courses, which the university pays. Moreover, control leads to a more attentive performance of their duties, i.e. after the end of the following semester or academic year, the teacher provides a report with a presentation in which he tells what methods and ways the acquired skills were implemented in practice. If such a report is not provided or is fictitious, the university may deduct the cost of the course from the employee's salary.

If the university attracts professionals to various positions that ensure the high-quality performance of new tasks dictated by the time, it, as a rule, cannot provide it with decent wages; the positions of engineers or junior teaching staff are too small.

#### 4. Reskilling Revolution

The analysis showed that many of the risks of the new way of life, including those that can cause significant harm, are related to staff.

According to McKinsey & Co, 400-800 million people (15% to 30% of the world's workforce) will be out of work in the world by 2030 due to the development of artificial intelligence and process automation [21]. These are the industries that are projected to be most affected by automation:

- accommodation and meals (more than 70%);
- production (60%);
- agriculture (about 6 per 10 jobs);
- transport (57%);
- retail trade and trade (50%) [21].

These changes will not bypass Ukraine. We believe that the company should explain to employees that the transition of the company to a new way does not mean job loss; on the contrary, work should become more comfortable because many routine processes will be replaced by automation, which must be monitored and managed. Thus, companies will need skilled workers who will be able to spend more "wisely" working and free time.

The classic model assumes that the employee must first be a professional in their field, have a deep knowledge of a set of tools and perform tasks. However, with the development of digital technology, the employee loses some of the relevant knowledge and skills if he does not continue to learn and improve their skills—for example, lawyers who want to remain leaders in their field study smart contracts and Blockchain technologies.

Since the 1990s, the world has talked about the organization of continuing education, which qualifies in five main areas:

- a) systematic problem solving;
- b) experiments with new approaches;
- c) learning from personal experience and history;
- d) learning based on the experience and best practices of others;
- e) an effective system of knowledge management in the organization.

Subsequently, there was a model of deliberately developing organizations (deliberately developmental organizations): the process of employee development is intertwined with everyday business processes.

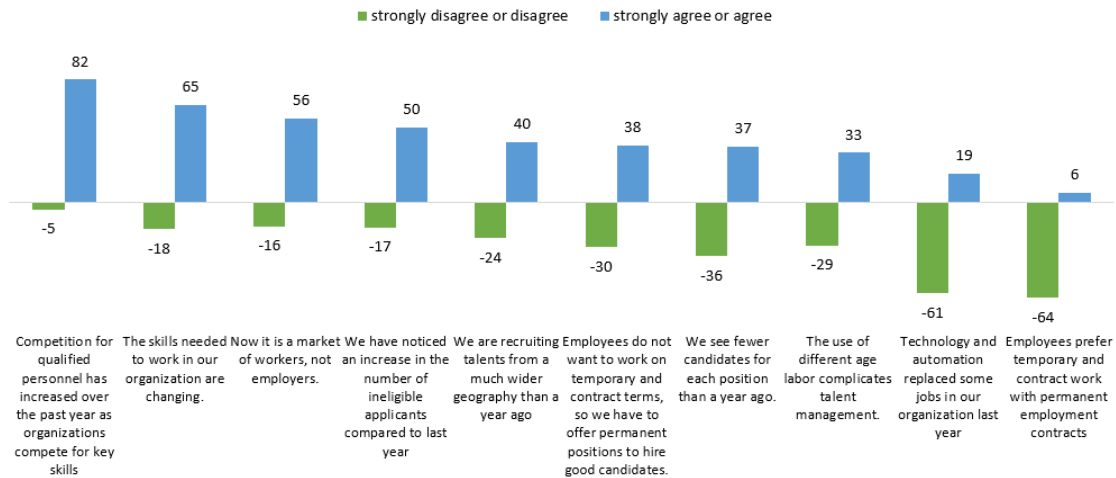
It is worth noting the latest foreign trends in personnel management. A study by the Charter Institute for Personnel and Development (CIPD) in the UK notes the following trends (Fig. 3).

Businesses are facing increasing competition for talented people and are increasingly recognizing that the skills needed to work in their organizations are changing. When it comes to views on the labour market, business leaders agree that competition for highly qualified personnel has increased.

Over the past year (82%), the skills needed to work in their organizations have changed (65%) (higher rates are still in the public sector, and larger organizations report this), and that this is now more a market for workers than employers (56%). Half also agree that they noticed an increase in the number of ineligible applicants. Businesses do not agree that employees prefer temporary and contract work to permanent positions (64%) and that technology and automation have replaced some jobs in their businesses (61%). But when it comes to automation, it happens in large organizations and is least common in the nonprofit sector. These results are similar to the survey in

2015 [22], with one notable difference – more companies two years ago hired talent from much wider geography than before (51%, compared to 40% this year).

**Figure 3.** Views on the employment market (% of respondents) (source: compiled by the authors based on [22])



This proves that personnel issues have already become one of the most critical issues in the effective functioning of the enterprise, and with the advent of CPR, they will become even more acute. Thus, now companies that want to be leaders in the industry need to move to a meaningful attitude to recruitment, training, work and retraining.

"One of the biggest problems in Ukraine is that large outsourcers are increasingly dominating the labour market - de facto, they are taking away the best developers en masse, and all this goes to serve other people's economies".

Production becomes more dynamic, efficient and technologically more complex thanks to Industry 4.0. This will have consequences for the future world of work: working conditions will be redesigned, and training will need new content—for example, robotics and automation of production. Many economists are deeply studying these fields because this is the first industrial revolution, where a huge number of jobs will be lost. Many experts are talking about the hundreds of millions of jobs that will change in the coming years around the world. At the same time, new specialities will appear. We may have to reconsider our social security system, which will change due to the technological revolution.

According to a report prepared for the forum, by 2020, new production technologies and widespread robotics will lay off jobs for 5.1 million people. The most serious reductions are expected among office and administrative employees.

Each revolution generates new words and concepts. One of the reports of the World Economic Forum in Davos is called "Reskilling Revolution". As the types of skills needed in the job market change rapidly, individual workers will have to participate in lifelong learning if they want to remain not just able to work but to achieve a full and rewarding career that allows them to maximize their employment opportunities. Retraining and retraining strategies will be critical for businesses to find the talent they need and contribute to a socially responsible approach to future work. For policymakers, retraining and retraining the existing workforce are important levers to stimulate future economic growth, increase society's resilience to technological change, and pave the way for future-ready education systems for the next generation of workers.

The Cambridge Dictionary defines retraining as "the process of learning new skills that allow you to do another job" or "teaching people to do another job" [23]. Thus, retraining and retraining are relevant areas of development of the world's leading companies, which should guide Ukrainian companies. With the scale of digital technology, changes in customer behaviour that have led to



changes in business models, the development and training component have become critical for virtually every company.

In turn, employees face their own problems related to personnel:

- 1) technologies are developing so quickly that employees need to retrain 2-3 times per career to match the market;
- 2) the enterprise does not have time to teach an employee who has just graduated from the institute an extra 2-3 years so that he becomes more professional;
- 3) many students prefer to go abroad and receive more in working positions than they can earn here;
- 4) the enterprise cannot release employees for a long time to improve their qualifications.

## 5. Results and discussion

The analysis carried out allows us to single out the following problems associated with the revolution, dividing them into 4 groups:

- 1) general problems of education;
- 2) problems of universities;
- 3) company problems;
- 4) problems of the state.

We believe that these problems can be solved by creating smart clusters (Fig. 3).

We will pay special attention to the interaction of stakeholders, namely, what the first participant in the chain gets from the second:

1 – university-business: a) teachers teach short-term refresher courses for employees of the enterprise; b) students undergo practical training at the enterprise, as a result of which they become more competitive in the labour market; c) the prestige of the university increases and more students want to study in it; d) financing through the implementation of economic contracts.

2 – business-university: a) professional development of employees takes place practically without interruption from production; b) the company is confident in the qualifications of the speakers; c) students at the expense of the state undergo practical training at the enterprise, among which it can then choose the best, i.e. in fact, the state pays for the probationary period; d) solving applied problems with the help of science.

3 – business-state: receives incentives from the state for participation in the cluster in the form of tax cuts, additional funding, and so on;

4 – government-business: tax revenue increases;

5 – university-state: funding;

6 – state-university: by financing priority professions, the state redistributes the labour force, filling the "staff shortage" in certain industries;

7 – research institute-state: funding; government orders;

8 – state-scientific institute: solving fundamental problems with the help of science;

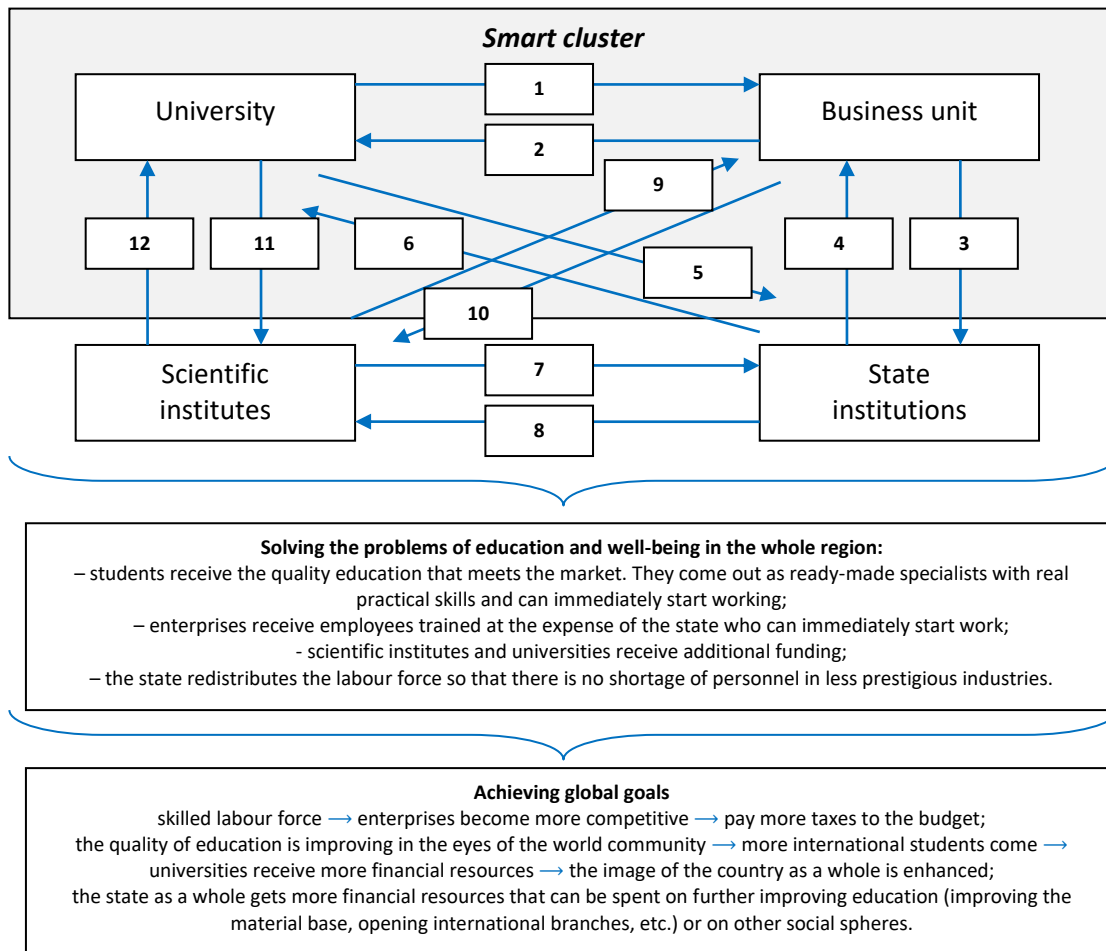
9 – research institute-business: financing through the implementation of economic contracts.

10 – business-science institute: solving applied problems with the help of science.

11 – university-scientific institute: a) mutually beneficial cooperation: students/PhD students/teachers, passing scientific practice or advanced training, improve their soft skills, ability to scientific research, learn more advanced methodologies; b) joint participation in international grants; c) joint implementation of business contracts and state funding of science.



**Figure 4.** The conceptual framework for creating a smart cluster for solving educational problems (source: developed by the authors)



12 – scientific institute-university: mutually beneficial cooperation: a) joint implementation of economic contracts and state funding of science; b) joint participation in international grants; c) attracting masters/PhD students to implement current assignments.

This kind of stakeholder cooperation leads to a synergistic effect, which contributes to better education, an increase in the quality of the workforce, retraining of employees and, in general, contributes to the growth of the country's well-being and its image in the world arena.

## 6. Conclusions

The study showed that only through joint efforts and cooperation between universities, employers, research institutes, and the state could the quality of education be improved. Enterprises can be provided with a qualified workforce on a permanent rotation basis. This will allow research institutes and universities to increase funding, which can be directed not only to maintaining the current state but also to the development and introduction of resource-saving technologies, which we see as further research methods. In general, the quality of education will come not only to the country's welfare but also to improve its image in the world.

## References

1. Bashynska, I., Dyskina, A. (2018). The overview-analytical document of the international experience of building smart city. *Business: Theory and Practice*, 19, pp. 228-241. <https://doi.org/10.3846/btp.2018.23>

2. Bashynska, I. (2020). Management of smartization of business processes of an industrial enterprise to ensure its economic security. Schweinfurt: Time Realities Scientific Group UG (haftungsbeschränkt), 420 p.
3. Kruty, K., Zdanevych, L., Demianenko, O., Pakhalchuk, N., Perminova, L., Garachkovska, O. (2019). E-learning methods in students' education. *International Journal of Innovative Technology and Exploring Engineering*, 8(12), pp. 251-256.
4. Kichuk, Y. (2017). The role of the university in the social and cultural creativity of the local society (Budzhak region). *Danubius*, 2017(35), pp. 313-320.
5. Kichuk, Y., Kunchenko-Kharchenko, V., Hrushchynska, N., Zhukova, Y., Yarish, O. (2021). Intellectual capital of institutions of higher education in the knowledge economy. *Journal of Optimization in Industrial Engineering*, 14(1), pp. 183-190.
6. The Reskilling Revolution: Better Skills, Better Jobs, Better Education for a Billion People by 2030. <https://www.weforum.org/press/2020/01/the-reskilling-revolution-better-skills-better-jobs-better-education-for-a-billion-people-by-2030/>
7. Baklanova, O., Petrova, M., Koval, V. (2020). Institutional transmission in economic development. *Ikonomicheski Izsledvania*, 29(1), pp. 68-91.
8. Bykova, N. (2020). Indicators of competence achievement in state educational standards. DOI: 10.32743/2658-6487.2020.11.22.407
9. Korauš, A., Dobrovič, J., Polák, J., Kelemen, P. (2019). Security position and detection of unusual business operations from science and research perspective. *Entrepreneurship and Sustainability Issues*, 6(3), pp. 1270-1279.
10. Kovtunenکو, K., Kovtunenکو, Y., Shatskova, L., Yatsenko, M. (2019). Management mechanism as an independent element of the food industry enterprise innovative activity expenditures management system. *Journal of Hygienic Engineering and Design*, 28, pp. 73-80.
11. Filyppova, S., Okulich-Kazarin, V., Kibik, O., Shamborovskyi, G., Cherkasova, S. (2019). Influence of the market of business intellectual services on the innovation safety of EU countries. *Journal of Security and Sustainability Issues*, 9(1), pp. 347-360.
12. Oborskyi, G., Orgiyan, A., Tonkonogyi, V., Aymen, A., Balaniuk, A. (2020). Study of dynamic impacts at combined operations of the thin turning and boring. *Lecture Notes in Mechanical Engineering*, pp. 226-235.
13. Orgiyan, A., Tkachenko, B., Oborskyi, G., Balaniuk, A., Iorgachov, V. (2020). Determining rational cutting modes for horizontal boring operation adjusted for the variable rigidity of the process system, *Lecture Notes in Mechanical Engineering*, pp. 246-253.
14. Drozd, O., Zashcholkin, K., Martynyuk, O., Drozd, J., Sulima, Y. (2020). Development of ICT Models in Area of Safety Education. 2020 IEEE East-West Design and Test Symposium, EWDTs 2020 – Proceedings, 9224861
15. Bartosova, V., Voloshchuk, L., Romanovska, Y., Podra, O., Ivanyshyna, G. (2019). Directions of reduction of the audit risks in the conditions of the electronic economy. *Academy of Accounting and Financial Studies Journal*, 23(Special Issue 2), 5 p.
16. Balan, O., Moskalyk, H., Peredalo, K., Hurman, O., Samarchenko, I., Revin, F. (2020). Using the pattern method for the comprehensive organization of recruitment and selection of personnel. *International Journal of Advanced Research in Engineering and Technology*, 11(4), pp. 290-300.
17. Halkiv, L., Karyy, O., Kulyniak, I., Ohinok, S. (2020). Innovative, scientific and technical activities in Ukraine: Modern trends and forecasts. Proceedings of the 2020 IEEE 3rd International Conference on Data Stream Mining and Processing, DSMP 2020, 2020, pp. 321-324, 9204148
18. Oklander, M., Oklander, T., Yashkina, O., Pedko, I., Chaikovska, M. (2018). Analysis of technological innovations in digital marketing. *Eastern-European Journal of Enterprise Technologies*, 5(3-95), pp. 80-91.

19. The Atlas of New Professions. <https://atlas100.ru/catalog/>
20. Atlas of new professions 3.0. (2020). /ed. D. Varlamova, D. Sudakova. Intellectual Literature, 456 p.
21. A future that works: automation, employment, and productivity. McKinsey & Company (2017). [https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Digital%20Disruption/Harnessing%20automation%20for%20a%20ofuture%20that%20works/MGI-A-future-that-works\\_Full-report.pdf](https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Digital%20Disruption/Harnessing%20automation%20for%20a%20ofuture%20that%20works/MGI-A-future-that-works_Full-report.pdf).
22. Resourcing and talent planning: Survey report 2015. CIPD. [https://www.cipd.co.uk/Images/resourcing-talent-planning\\_2015\\_tcm18-11303.pdf](https://www.cipd.co.uk/Images/resourcing-talent-planning_2015_tcm18-11303.pdf).
23. The Cambridge Dictionary. Cambridge University Press. <https://dictionary.cambridge.org/reskilling>