Фундаментальные основы и междисциплинарные связи / Fundamental Principles and Interdisciplinary Connections

Научная статья
Original article
DOI: 10.12731/2658-4034-2026-17-2-1125
EDN: XWAOLC
UDC 37.011

Evolution of professional education in Russia at the shift of scientific and technological paradigm

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Abstract

Background. Professional education is connected with the fundamental foundations of society, mostly with its economic and productive forces. However, the economic context is narrow to substantiate the patterns of evolution of professional education. It draws the author to the category "scientific and technological paradigm" as a set of sociocultural, historical, and political conditions at a certain level of technological production and knowledge production in its broad sense.

The **purpose** is to identify the evolutionary patterns of the development of professional education in Russia at the shift of scientific and technological paradigms.

Materials and methods. The main research methods are conceptualization, transfer of research results from related fields of science to the field of professional education, and forecasting the development of professional education. The research is based on the concept of sociocultural evolution and the methodology of the scenario approach to the development of socio-cultural systems. The article reflects the dissertation research conducted in the years 2010–2021.

Results. The scientific and technological paradigm has a strategic impact on professional education. The periods of professional education development (emergence, formation, development, diversification, and integration) are correlated with technological paradigms. As the scientific and technological paradigm shifts from the craft to the industrial one, and then to information and the anticipated post-information paradigm, the evolution of professional education accelerates, and the development takes on a spiral pattern, with the system structure becoming more complex. The author associates these characteristics with the process of gradual accumulation of educational paradigms, in

which the subsequent paradigm absorbs the preceding one, thereby increasing the number of connections in the system. Based on the current state of the professional education system, three possible scenarios for its further development are predicted: organizational, technological, and subjective ones; the main features of each scenario are identified.

Keywords: professional education; evolution; scientific and technological paradigm; paradigm of professional education; scenario approach; principle of variability and probability

For citation. Maksimova, E. A. (2026). Evolution of professional education in Russia at the shift of scientific and technological paradigm. *Russian Journal of Education and Psychology*, *17*(2), 122–136. https://doi.org/10.12731/2658-4034-2026-17-2-1125

Эволюция профессионального образования в России в контексте смены научно-технологических укладов

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Abstract

Обоснование. Профессиональное образование связано с фундаментальными основами общества, наиболее органично – с экономической, производительной деятельностью. Однако экономический контекст узок для научного обоснования закономерностей эволюционирования системы профессионального образования. Автор обращается к категории «научно-технологический уклад» как совокупности социокультурных, исторических, политических условий на определенном уровне технологического производства и производства знания в самом широком смысле.

Цель – выявление эволюционных закономерностей развития профессионального образования в России в контексте смены научно-технологических укладов.

Материалы и методы. Главные методы исследования – концептуализация, перенос результатов исследований смежных областей науки в сферу профессионального образования, прогнозирование направлений развития профессионального образования. Исследование опирается на положения концепции социокультурной эволюции и методологию сценарного подхода к развитию социокультурных систем. Статья отражает материалы диссертационного исследования, выполненного в течение 2010–2021 гг.

Результаты. Научно-технологический уклад оказывает стратегическое влияние на профессиональное образование. Периоды развития профессионального образования (зарождение, становление, развитие, диверсификация, интеграция) соотнесены с технологическими укладами. При смене научно-технологических

укладов от ремесленного к промышленному, далее к далее к информационному и предполагаемому постинформационному эволюция профессионального образования ускоряется, развитие имеет спиралевидный характер, структура системы усложняется. Автор связывает эти характеристики с процессом постепенного наслоения парадигм образования, в котором последующая парадигма вбирает в себя предшествующую, тем самым увеличивая число связей в системе. На основе актуального состояния системы профессионального образования спрогнозированы три возможных сценария ее дальнейшего развития – организационный, технологический, субъектный, обозначены основные признаки каждого из сценариев.

Ключевые слова: профессиональное образование; эволюция; научно-технологический уклад; парадигма профессионального образования; сценарный подход; принцип вариативности и вероятностности

Для цитирования. Максимова, Е. А. (2026). Эволюция профессионального образования в России в контексте смены научно-технологических укладов. *Russian Journal of Education and Psychology*, *17*(2), 122–136. https://doi.org/10.12731/2658-4034-2026-17-2-1125

Introduction

Professional education is closely connected the productive activity, since the appearance of the first tools in a primitive society stimulated the transfer of experience in their manufacture and use. As production facilities and technologies developed, the system of professional education was reformed and adjusted to meet production needs. However, the challenges facing the system of professional education and its potential in shaping the image of society through human reproduction in the entirety of its characteristics make the economic context narrow for scientific substantiation of patterns and trends in the development of professional education. The desire to find a more appropriate context makes it possible to refer to the category of "scientific and technological paradigm". The author conducted a deep research on the scientific and technological paradigm and its impact on the characteristics of the system of professional education [11]. Some of the speculations and conclusions drawn are presented further in the text.

The concept of "technological paradigm" is firmly established in science. Under it, the authors (S. Glasyev, N. Kondratyev, V. Inozemtsev, D. Lvov and others) mean a set of synchronically developing industries of the common technical level. Economists and sociologists talk about six technological

paradigms in which science and industry have developed based on the use of different sources energy, starting with water, steam, electricity, petroleum products, and then passing on to microelectronics, and nanotechnology [5-7; 10]. Based on the research of V. Slobodchikov & S. Zverev [17], G. Dosi & R. Nelson [20], and Dr. El Majdoubi [21] we have formulated the idea of not the technological, but the scientific and technological paradigm, under which a stable scientific, technological and axiological foundations of society, determined by the stage of development of the means of production and the nature of work in society is meant [11]. Based on the comparison of G.N. Volkov's and A.I. Polovinkin's periodization of the development of the means of production [4; 16], supplemented by D. Bell's periodization of industrial development [1], K. Marx's concept of the relations between subjects of labor [13], and N.A. Berdyaev's theory of the development of society [2], we figured out four successively alternating scientific and technological paradigms. They are craft, industrial, informational, and post-informational ones. Scientific and technological paradigms are broader than the technological paradigms since along the technological component itself, they also include axiological orientations of the society.

The transformation of the scientific and technological paradigms determines the development of professional education. The change in the scale and structure of professional education and the intensity of the functioning of educational institutions took place at the following stages:

1) the emergence of vocational training – up to the beginning of the XVIII century (the development of a certain type of occupation as integrated to everyday life);

2) the formation of professional education – up to the second half of the XIX century (practical professional experience acquired in the form of the personalized apprenticeship);

3) the development of professional education – up to the end of the 20th century (branch–based multi-level educational institutions);

4) the diversification of professional education until the second half of the 21st century (multidisciplinary educational organizations);

5) the integration of professional education, approximately from the second half of the 21st century (professional education in educational associations).

Materials and methods

The identification of the stages of professional education development and their characteristics show that similar trends are manifested in different scientific and technological paradigms, but their manifestation depends on the specifics of cultural, historical and socio-economic background. The trend to view previous experience in the altered background and the desire to adapt it to different cultural realities forced the author to deeply analyze the methodology of the theory of evolution. Classical theories of evolution, represented by the works of Ch. Darwin, R. Fisher, E. Tylor, L. Morgan, and G. Spencer have a common foundation – the development is viewed as a line from simple primitive forms to more complex ones. In this regard, the conceptualization and transfer of research results from other sciences to the field of professional education has become the main research method. Modern ideas of evolution, sometimes viewed as social differentiation (R. Stichwen [23]), focus on a non-linear nature and on the absence of universal patterns of development of socio-cultural systems. Evolution as the breakdown of a system in the result of exceeding a critical number of external influences reveals the irreversibility of changes (N. N. Moiseev [14]). The content of evolution as a bi-directional movement of society explains the alternation of periods of its extensive and intensive development (A. A. Pelipenko [15]). The co-evolution of society and the biosphere in the context of globalization does not allow for a single final model of education (A. D. Ursul [18]).

Based on the analysis of the theories mentioned above, it is concluded that there are analogues of biological and social processes in professional education, for example, development from the simplest forms to complex systems, the causality of the development by a combination of external and internal factors. An appeal to the theory of the spiral development of society (J. Vico [3]) allowed the author to conclude that any society repeats the same stages in its development in the same sequence at a higher level, not precisely, but reproducing them in new forms. For example, individual education was typical for craft apprenticeships, and for tutorials (the form of elite higher education), and now scientific and practical interest in it is manifested in the form of individual educational trajectories.

The interpretation of the theories of evolution made it possible to formulate the idea of the evolution of professional education as the process of its origin and active interaction with the scientific and technological paradigm, as well as the reproduction of the structure of professional education with updated characteristics at the change of the paradigm. The evolutionary nature of the development of professional education is observed in such characteristics as a reduction in the duration of each subsequent period, a spiral-shaped direction, complication of the structure of the system of education.

Results and discussions

The application of the methodology of the theory of evolution makes it possible to substantiate the paradigms of professional education, the consistent layering of which determines the specified nature of the system's development. The paradigm of professional education is its ideological basis, in which the current way of organizing professional activity is combined with the goal of professional development so that the product of the goal-setting of the previous paradigm becomes the basis of the changing paradigm. The presence of operational-cognitive, cognitive-activity, activity-competence, competence-anthropological paradigms is determined. The consistent layering of paradigms explains the polyparadigmality of professional education and clarifies the idea of the sources of its development [11; 12].

It is necessary to clarify that, speaking about the development of professional education as a system, we rely on the idea of the pedagogical system formulated by N.V. Kuzmina [9]. Following it, we identified the invariant elements of professional education – the forms of its organization, the content of professional education and the technology of its development, the requirements imposed on teachers and students, combined to fulfill the mission of professional education in different scientific and technological paradigms.

The mechanism of professional education development is a set of processes determined by socio-economic, political, cultural and historical reasons. It has a discrete character and acts when there is a dissonance between the external and internal conditions of the functioning of vocational education in the form of aggravation and resolution of a number of contradictions.

Here are some examples. A change in the perception of the mission of professional education is connected with the alternation of polar trends towards increasing and decreasing the educational function of the scientific and technological paradigm, in particular, its socio-economic component. In the craft paradigm, the magnitude of this function was significant. A person mastered the external environment through the prism of professional affiliation, predetermined by family occupation. He acquired the knowledge, skills necessary for his professional activity in the labor process, the organization of which remained unchanged for centuries, and which was integrated into everyday life, was its condition and life-sustaining resource. With the development of the industrial paradigm, the value of the educational function of the socio-economic environment decreased, as education separated from work: first people studied, and then they started working. The purpose of professional education was to equip future workers in various sectors of the economy with professionally necessary knowledge, skills and abilities in a network of highly specialized educational institutions. The information system has shown a tendency to increase the educational function of the external environment as an inexhaustible source of information, which is a full-fledged resource for professional activity. In parallel with the establishment of a competence-based approach to determining educational outcomes, there has been a return to the idea of holistic human development. In contrast to integrity, which is characteristic of the formation of a professional in a society with an operational-cognitive paradigm and a different worldview through the prism of professional affiliation, integrity presupposes a complex structured unity. In the idea of the holistic development of a professional's personality, his versatility is important, related to the development of competencies that allow him to master new types of professional practices independently. In the idea of the mission of professional education, the emphasis is shifted to the subject: personal growth in the process of mastering professional activity.

Here is another example to confirm the mechanism of professional education development. In the organization of professional education, it is implemented in the process of resolving contradictions between trends towards regionalization and centralization of education, as well as trends towards

egalitarization and elitization of public access to it. It is noted that government policy plays a crucial role in changing the territorial organization of professional education and public access to it. In this regard, the manifestations of the strategic trend in the development of professional education need to be complemented by solving short-term socio-political problems. To a greater extent, they affect the sphere of higher education, which, in addition to the economic function of personnel reproduction, also has political significance for industries and public practices.

A tendency towards regionalization of education is observed during periods of active economic and social recovery, and economic development of new regions. Some well-known facts are: the opening of educational institutions on the periphery during the period of Peter the Great's reforms, in the first half of the 19th century, with the active construction of roads; the opening of dozens of specialized universities that duplicated each other in the regions in the early years of Soviet power; the evacuation of more than 40 universities to the Urals during the Great Patriotic War, which contributed not only to the development of the education system in this region, but also to the growth of its importance in the post-war reconstruction. On the other hand, the internal policy of the state has repeatedly demonstrated a focus on the centralized location of universities or their reduction on the periphery. In particular, during Elizabeth's reign, universities were organized in the capitals and had a pronounced humanitarian orientation (university in Moscow, Imperial Academy of Arts in St. Petersburg). The reforms of Alexander III led to a reduction in universities in remote regions; the reform of the higher education system in the 2010s led to the consolidation of a number of universities and a reduction in their number.

It is also shown that government policy defines measures to ensure access to education. It is revealed that, in general, the vector of professional education development is directed towards its egalitarization. The main milestones were: the opening of a large number of professional educational institutions during the reign of Peter I to cover the personnel needs of economic sectors; the course for free vocational schools under Catherine II; the opening of non-governmental universities, which increased the number of students required during the intensive mechanization of production; the

proletarization of higher education in the early years of Soviet rule and its commercialization at the turn of the 20th and 21st centuries. On the other hand, the trend towards the elitization of public access to higher education is periodically traced in different scientific and technological paradigms. Thus, during the reign of Alexander I, increased attention was paid to military educational institutions, and higher educational institutions for the military (in particular, the Page Corps) received elite status. The negative consequences of the proletarianization of higher education in the 1920s contributed to tougher conditions for higher education (exams and the grading system were returned). In the middle of the 20th century, university graduation was a symbol of privileged social affiliation, which, according to a number of researchers, contributed to the stratification of society contrary to socialist ideology. Currently, the trend towards the elitization of higher education can be traced in the right of a number of universities to conduct additional entrance examinations.

The presence of trends and patterns in the development of vocational education allows for a forecast analysis of further structural and functional changes in the system. The solution to this problem is related to the use of a scenario approach to modeling educational processes (developed by N. Kuznetsova [8], J. Abdessaadak & K. Reklaoui [19], Y. Peter & X. le Pallec [22]). Based on the principles of variability and probability inherent in evolutionary modeling, three scenarios were substantiated: organizational, technological, and subjective, and their advantages and risks were noted.

The organizational scenario is associated with the proliferation of educational associations, mainly clusters, corporate universities and university complexes. Its advantage is to ensure the "identity of professional activity and vocational education" in educational associations. The main risks of this scenario are reducing the mission of vocational education to serving the needs of the enterprise, and a lack of opportunities for human development.

Following the technological scenario involves the development of professional education through the creation of digital educational platforms, the proliferation of virtual laboratories, and simulation simulators, which requires pooling the resources of educational organizations and will contribute to the individualization of the educational process. The risk of this

scenario lies in the absolutization of the technical component of technologies, underestimating their humanistic capabilities. While in accordance with the law of techno-humanitarian balance, with more powerful technologies, the socio-cultural means regulating them must be more perfect in order to ensure the sustainability of society.

The subjective development scenario is associated with a change in the axiology of professional education and the establishment of a dynamic balance between the socio-economic and natural environment as the main value. It requires a revision of the human attitude to the natural environment, initiates the consolidation of the concept of ecology as an interdisciplinary category in the public consciousness and actualizes the role of subjects of the educational process in the formation of advanced education as having a nature-saving potential.

The scenario approach to forecasting is carried out taking into account the nonlinear, variable and probabilistic nature of the development of vocational education. Its importance for the theory and methodology of pedagogy lies in the possibility of forming an independent direction of pedagogical research related to the early identification of risks and minimizing their negative impact on vocational education.

The presented idea of the evolutionary development of professional education with the change of scientific and technological paradigms is quite complete, but it is not meant to be accomplished. A further area of research may be the study of mutual changes in the system of general and professional education in the context of evolutionary theory.

Conclusion

1. The characteristics of the system of professional education are determined by the dominant scientific and technological paradigm. The scientific and technological paradigm is a stable scientific, technological and axiological basis of society, determined by the stage of development of the means of production and the nature of work in society.

2. The periods of development of professional education are related to the scientific and technological paradigms as follows: the craft paradigm – the origin and formation of professional education, the industrial paradigm –

the development of professional education, the information paradigm – the diversification of professional education, the post–information paradigm – the integration of professional education.

3. The development of professional education has characteristics of evolution development – spiraling (returning to previous characteristics at a new level), discreteness (alternating periods of calm and abrupt development), acceleration (shortening the duration of development stages), complication of the structure (increasing the number of connections between the elements of the vocational education system in each subsequent period of development).

4. The mechanism of the evolution of professional education is presented by the alternation of periods of stable development, crises and explosive development.

5. The directions of further development of professional education are determined by the element of the system in which, due to socio-economic necessity or cultural significance, the resources necessary to overcome contradictions will be concentrated. Three scenarios are most likely: organizational (the spread of educational clusters, holdings, and consortia), technological (the transfer of the educational process to a virtual environment and digital educational platforms), and subjective (the transformation of forms of public consciousness and a nature-saving strategy for professional activity).

Acknowledgements. *The author is deeply and sincerely grateful to Professor Ekaterina Aleksandrova for her emotional support and encouragement as well as for* insightful discussions that significantly enriched this research.

References

1. Bell, D. (2004). *The Coming of Post-Industrial Society: A Venture in Social Forecasting*. Moscow: Academia. 783 p.
2. Berdyaev, N. A. (2006). Man and machine (the problem of sociology and metaphysics of technology). In: *Pedagogical Journalism of the Russian Diaspora*. Saransk, pp. 30–54.
3. Vico, G. (1940). *Foundations of a New Science Concerning the Common Nature of Nations*. URL: https://book-olds.ru/BookLibrary/01000-Zarubezhnaya-istoriya/1940.-Osnovanie-novoy-nauki-ob-obschey-prirode-natsiy.html?ysclid=min7zzbza8146405669
4. Volkov, G. N. (1976). *Origins and Horizons of Progress*. Moscow: Politizdat. 335 p.

5. Glazyev, S. Yu., & Mikerin, G. I. (1991). *Long Waves: Scientific and Technological Progress and Socio-Economic Development*. Novosibirsk: Nauka. 224 p. ISBN: 5-02-029449-7. EDN: https://elibrary.ru/TRYTMX
6. Inozemtsev, V. L. (2000). *Modern Post-Industrial Society: Nature, Contradictions, Prospects*. Moscow: Logos. 302 p.
7. Kondratiev, N. D. (1989). Major cycles of economic conjuncture: report. In: *Problems of Economic Dynamics*. Moscow: Ekonomika, pp. 172–226.
8. Kuznetsova, N. E. (2009). System modeling and scenario approach as a methodology for the project activities of a teacher and a student at a pedagogical university. *Science and School*, *(4)*, 10–14. EDN: https://elibrary.ru/MWLHHP
9. Kuzmina, N. V. (2002). The concept of a "pedagogical system" and criteria for its evaluation. In: *Methods of System Pedagogical Research*. Moscow: Narodnoe Obrazovanie, pp. 7–52. EDN: https://elibrary.ru/WRPBHA
10. Lvov, D. S. (2007). *Russia: Framework of Reality and Outlines of the Future*. Moscow: Publishing House of Economic Strategies. 117 p.
11. Maksimova, E. A. (2021). *The Concept of Vocational Education Development in Russia amid the Shift of Scientific and Technological Modes* (Doctoral dissertation). Saratov. 346 p. EDN: https://elibrary.ru/MTECNK
12. Maksimova, E. A. (2022). Principles of evolutionary modeling in the study of vocational education development. *Izvestiya of Saratov University. New Series. Series: Philosophy. Psychology. Pedagogy*, *22*(3), 345–349. https://doi.org/10.18500/1819-7671-2022-22-3-345-349. EDN: https://elibrary.ru/YWAJIX
13. Marx, K. (2000). *Sociology: Collection*. Moscow: Kanon Press C. 432 p.
14. Moiseev, N. N. (2001). *Universum. Information. Society*. Moscow: Ustoychivyy Mir. 200 p.
15. Pelipenko, A. A. (2016). Features of sociocultural evolution. *Culture of Culture*, *(1 (9))*, 29–34. EDN: https://elibrary.ru/VDGQMV
16. Polovinkin, A. I. (1985). *Laws of Structure and Development of Technology*. Volgograd: VPI. 202 p.
17. Slobodchikov, V. I., & Zverev, S. M. (2014). Scientific and technological modes and approaches in vocational education. In: *Introduction to the Anthropology of Education* (Issue II). 190 p.
18. Ursul, A. D., & Ursul, T. A. (2012). Evolutionary paradigms and models of education in the 21st century. *Modern Education*, *(1)*, 1–67. EDN: https://elibrary.ru/PIQGNL
19. Abdessadak, J., & Reklaoui, K. (2025). Pedagogical scenario for innovation: a framework for skill development. In: *International Conference on Advanced Intelligent Systems for Sustainable Development*. Lecture Notes in Networks and Systems (Vol. 1403). Springer, Cham. https://doi.org/10.1007/978-3-031-91337-2_82

20. Dosi, G., & Nelson, R. R. (2016). Technological paradigms and technological trajectories. In: *The Palgrave Encyclopedia of Strategic Management*. Palgrave Macmillan, London. https://doi.org/10.1057/978-1-349-94848-2_733-1
21. El Majdoubi, I. (2024). Technological paradigms in education: unveiling the dynamics of innovation in pedagogical practices. *International Journal of Social Science and Human Research*, *7*(8). https://doi.org/10.47191/ijsshr/v7-i08-103. EDN: https://elibrary.ru/NGTHQP
22. Peter, Y., Le Pallec, X., & Vantroys, T. (2008). Pedagogical scenario modelling, deployment, execution and evolution. In: *Architecture Solutions for E-Learning Systems*. https://doi.org/10.4018/978-1-59904-633-4.ch015
23. Stichweh, R. (2020). Sociocultural evolution and social differentiation: the study of the history of society and the two sociologies of change and transformation. *Soziale Systeme*, *25*(2), 518–529. https://doi.org/10.1515/sosys-2020-0028. EDN: https://elibrary.ru/IQWDEA

Список литературы

1. Белл, Д. (2004). *Грядущее постиндустриальное общество: опыт социального прогнозирования*. Москва: Academia. 783 с.
2. Бердяев, Н. А. (2006). Человек и машина (проблема социологии и метафизики техники). В сб.: *Педагогическая публицистика Российского зарубежья*. Саранск, с. 30–54.
3. Вико, Дж. (1940). *Основания новой науки об общей природе наций*. URL: https://book-olds.ru/BookLibrary/01000-Zarubezhnaya-istoriya/1940.-Osnovanie-novoy-nauki-ob-obschey-prirode-natsiy.html?ysclid=min7zzbza8146405669
4. Волков, Г. Н. (1976). *Истоки и горизонты прогресса*. Москва: Политиздат. 335 с.
5. Глазьев, С. Ю., Микерин, Г. И. (1991). *Длинные волны: научно-технический прогресс и социально-экономическое развитие*. Новосибирск: Наука. 224 с. ISBN: 5-02-029449-7. EDN: https://elibrary.ru/TRYTMX
6. Иноземцев, В. Л. (2000). *Современное постиндустриальное общество: природа, противоречия, перспективы*. Москва: Логос. 302 с.
7. Кондратьев, Н. Д. (1989). Большие циклы экономической конъюнктуры: доклад. В кн.: *Проблемы экономической динамики*. Москва: Экономика, с. 172–226.
8. Кузнецова, Н. Е. (2009). Системное моделирование и сценарный подход как методология проектной деятельности педагога и студента педагогического вуза. *Наука и школа*, (4), 10–14. EDN: https://elibrary.ru/MWLHHP
9. Кузьмина, Н. В. (2002). Понятие «педагогической системы» и критерии её оценки. В сб.: *Методы системного педагогического исследования*. Москва: Народное образование, с. 7–52. EDN: https://elibrary.ru/WRPBHA
10. Львов, Д. С. (2007). *Россия: рамки реальности и контуры будущего*. Москва: Изд-во экономических стратегий. 117 с.

11. Максимова, Е. А. (2021). *Концепция развития профессионального образования в России при смене научно-технологических укладов*: дис. … д-ра пед. наук. Саратов. 346 с. EDN: https://elibrary.ru/MTECNK
12. Максимова, Е. А. (2022). Принципы эволюционного моделирования в исследовании развития профессионального образования. *Известия Саратовского университета. Новая серия. Серия: Философия. Психология. Педагогика*, *22*(3), 345–349. https://doi.org/10.18500/1819-7671-2022-22-3-345-349. EDN: https://elibrary.ru/YWAJIX
13. Маркс, К. (2000). *Социология: сборник*. Москва: Канон-Пресс-Ц. 432 с.
14. Моисеев, Н. Н. (2001). *Универсум. Информация. Общество*. Москва: Устойчивый мир. 200 с.
15. Пелипенко, А. А. (2016). Особенности социокультурной эволюции. *Культура культуры*, (1 (9)), 29–34. EDN: https://elibrary.ru/VDGQMV
16. Половинкин, А. И. (1985). *Законы строения и развития техники*. Волгоград: ВПИ. 202 с.
17. Слободчиков, В. И., Зверев, С. М. (2014). Научно-технологические уклады и подходы в профессиональном образовании. В кн.: *Введение в антропологию образования. Выпуск II*. 190 с.
18. Урсул, А. Д., Урсул, Т. А. (2012). Эволюционные парадигмы и модели образования XXI века. *Современное образование*, (1), 1–67. EDN: https://elibrary.ru/PIQGNL
19. Abdessadak, J., & Reklaoui, K. (2025). Pedagogical scenario for innovation: a framework for skill development. In: *International Conference on Advanced Intelligent Systems for Sustainable Development. Lecture Notes in Networks and Systems* (vol. 1403). Springer, Cham. https://doi.org/10.1007/978-3-031-91337-2_82
20. Dosi, G., & Nelson, R. R. (2016). Technological paradigms and technological trajectories. In: *The Palgrave Encyclopedia of Strategic Management*. Palgrave Macmillan, London. https://doi.org/10.1057/978-1-349-94848-2_733-1
21. El Majdoubi, I. (2024). Technological paradigms in education: unveiling the dynamics of innovation in pedagogical practices. *International Journal of Social Science and Human Research*, *7*(8). https://doi.org/10.47191/ijsshr/v7-i08-103. EDN: https://elibrary.ru/NGTHQP
22. Peter, Y., Le Pallec, X., & Vantroys, T. (2008). Pedagogical scenario modelling, deployment, execution and evolution. In: *Architecture Solutions for E-Learning Systems*. https://doi.org/10.4018/978-1-59904-633-4.ch015
23. Stichweh, R. (2020). Sociocultural evolution and social differentiation: the study of the history of society and the two sociologies of change and transformation. *Soziale Systeme*, *25*(2), 518–529. https://doi.org/10.1515/sosys-2020-0028. EDN: https://elibrary.ru/IQWDEA

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Поступила 10.12.2025
После рецензирования 09.01.2026
Принята 12.01.2026

Received 10.12.2025
Revised 09.01.2026
Accepted 12.01.2026