

# Concepts of methodology for digitalization of additional education of children and youth

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**Abstract.** The preconditions for the research are based on sustained trends of the influence of development rates of digital economy, information space in Belarus on dynamics of digital transformation of additional education of children and youth (AECY). Analysis of AECY digital transformation revealed specific properties of didactic singularity of information education environment, network clustering of resources, dynamics of media environment contour, e-technologization of didactics. The established preconditions of stability of AECY digitization as a constant of transfer to regulations predetermined the aim of this work: development, substantiation of methodological concepts of AECY digitization. The research methods included theoretical and empirical analysis, expert appraisals, simulation, forecasting. The results are comprised of development of a set of organizational and network, environmental, instrumental, technological, institutional concepts of scientific methodology of AECY digitization. The obtained results were verified in the project titled “Implementation of Republican methodological cluster as a resource of development of additional education of children and youth” (2017-2020) on the premises of National Center of Artistic Activity of Children and Youth (Minsk) in accordance with the Program of innovations of the Ministry of Education, Belarus. The novelty of the results is in introduction of the following categories into scientific usage of pedagogical science: didactic singularity of information and education environment, structure of media environment contour. The novelty of the results is reflected in authentic intelligent product of scientific and practical significance in the context of Belarus National Strategy of Sustainable Social and Economic Development–2030.

**Keywords:** didactic singularity of information and education environment, clustering of regional and local resources, structure of media environment contour, digital didactics.

## 1 Introduction

The growth dynamics of determinant influence of information factor of system changes in globally local world is appropriately reflected in digital transformation of education

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systems at the level of didactics as principles of education, content, and technologies of all types and stages. The system changes are based on regularities of information society related with high rate of creation, distribution, updating, and application of information in all aspects of life activity. Uniqueness of digital potential of information factor is in superior character of growth rates in comparison with such resources as capital, labor, energy [1]. Scientific and theoretical comprehension of trends, contradictions of digitization in the field of education are discussed in numerous works. However, the research areal of methodological problems of additional education of children and youth (hereinafter referred to as AECY) digitization is disclosed insufficiently. The novelty of the research is in original formulation of the problem, new methods of solution. The hypothesis of the research is as follows: efficiency of AECY digitization depends on conceptual substantiation of the methodology. The aim is comprised of the analysis of information factor, development of methodological concepts of AECY digitization as verification products. The tasks stipulate clarification of such notions as concept, methodology; substantiation of the concepts: didactic singularity of digital transformation of additional education, conceptual meaningfulness structure; clustering of regional, local, republican resources of unified AECY methodological network; axiological concept of media environment contour structure, digital didactics; institutional concept of digitization. Determinants of multiplicative functions of pedagogue are disclosed (teacher, educator, analyst, designer of education products).

## **2 Methods**

The research is characterized by interdisciplinary approach and practical orientation. Formulation of the problem determined the following methods: theoretical and empirical analysis, expert appraisal, generalization of sociological, economical, philosophical, pedagogical works by foreign and domestic authors. The publications were selected for the last five years by the following criteria: general trends of digital transformations in education [2-5]; peculiarities, principles of digitization of additional education as educational subsystem [6, 7]; specificity of AECY digital transformation [8]. Synthesis of theories, concepts, paradigms was carried out into design extrapolation of methodological concepts of digitization of additional education. The results of the project titled "Implementation of Republican methodological cluster as a resource of development of additional education of children and youth" (2017-2020) on the premises of National Center of Artistic Activity of Children and Youth (hereinafter referred to as NCAACY) were generalized. The research subject was determined in the context of the methodology: additional education of children and youth. The subject matter was substantiation of methodological concepts of AECY digitization in Belarus.

## **3 Results**

During the research the methodological concepts of AECY digitization were substantiated.

1. The conceptual meaningfulness of didactic singularity of AECY digital transformation was disclosed with consideration for varying information pattern of the world, economic, political, social and pedagogical determinants. The task of digitization was determined as the transfer from the use of actual content in education process to the stage of generation of new knowledge with participation of students.

2. The organization and network content of clustering of education and methodological resources of AECY was disclosed, the practical significance of methodological cases of regional services was revealed obtained during verification of the

innovation design project: Implementation of Republican methodological cluster as a resource of development of additional education of children and youth (2017-2020).

3. The environmental content of dynamics of media environment was substantiated, as well as its structure as a system of transboundary contents, translations, communications, theatrical, musical, intelligent forms isomorphic to the activity profile of enterprise. The notion of AECY media environment was determined as a unit of complex media system.

4. The instrumental specificity of the concept “e-functionality of AECY didactics” was disclosed, as well as factor meaning of online training of teachers, including basics of projective thinking, designing products under conditions of hi-tech environment.

5. Institutional methodological concept of AECY digitization was determined in provision of system approach to development of institutional environment aiming at adaptation to challenges of information factor. The institutional mechanism of the National Strategy of Sustainable Social and Economic Development–2030 [9] (hereinafter referred to as NSSED-2030) was disclosed as a tool of development of human potential and digitization of education.

## 4 Discussion

Comparison of the results with relevant data for the last five years is based on interpretation of concept as a category of pedagogic science, which denotes construct concept of methodology development as the system of principles of AECY digitization.

The basic methodological concept of AECY digitization is didactic singularity, its essence is in sensitivity of information and education environment to the cognitive aims of subjects of creative development, personalization of education route. The personalized approach is performed by digital technologies with consideration for Generation Z [3]. Application of digital technologies includes the components of education, correction, adaptation [10]. Personification integrates databases, telecommunication technologies, artificial intelligence, cloud storage, virtual or expanded space [11]. The features of education environment are in flexible interactive method of education under conditions of transboundary environment [6]. The concept of AECY singularity is stipulated by increase in the value of information, creativity; fraction of intelligent labor in production structure.

From here the concept of cluster approach arises in arrangement of Republican AECY methodological network [5]. The project of cluster organization was developed using the STEAM approach and the theory of clustering by M. Porter concerning coupling of science, education, practice [12]. The results of the project of clustering resources of methodological network were analyzed by the NCAACY expert council on the basis of estimation of priorities:

- digitization of content, education technologies, methods of organization;
- informatization of resource, technical, technological base;
- profiling of software telecommunication environment;
- improvement of digital compete of teachers [7].

Analysis of dynamics of digital transformation as an information universum creates background for development of axiological concept of AECY media environment contour as a spiritual value construct of self-determination. The content integrates programs, network principle of content reproduction of media environment as multicomponent system of printed, visual, audio resources. The structure organization of media system activates the following potentials: information, editorial, scientific and engineering, economic, audience, organizational [4]. The media environment includes subjected portion of information world picture; different levels of information environment, internal contour of microlevel; external contour of meso- and macrolevels of interchange with data, energy, resources of social, cultural, education environments. Forecasting reveals potential of new

macrostructures of Internet communications, complication of education tasks, improvement of media competence, capturing new media not excluding opportunities of neural networks, neural linguistic tool, etc. [13] The digitization strategies stipulate instrumental concept of e-functionality, multiplicative functions of pedagogue, teacher, educator, tutor, analyst, designer, engineer of education products [2]. Multiplicity of media education is understood as digital reality [14]. This complies with the UNESCO priorities in the field of media education [15]. Peculiarity of digital transformation is in didactic engineering: combination of analytical methods of micro- and macro-education processes, design means of products and diagnostic tools [16].

The system approach in AECY digitization is based on institutional methodological concept in the form of legal provisions, legal instruments, standards of digital economy, education, social sphere. The institutional background of digitization strategy is provided in the country: NSSD-2030, Decree by the President of Belarus No. 8 “On development of digital economy” [17], State program of development of digital economy and information community for the years 2016-2020, The strategy of informatization development for the years 2016-2022, Concepts of information safety of Belarus [18]. Examples of institutionalization of AECY digitization: programs of innovation activity, National Children Technopark, 48 entities of social and culture sphere.

## 5 Conclusion

Therefore, the methodology of AECY digitization is the conceptual system of principles and methods of personalization of routes in information and education environment; network clustering of education and methodological resources and instrumentation; integration of media environment and media system; information functionality of education; institutionalization of digitization and mechanisms of governmental regulation. AECY is a multifunctional system of reproduction of creative potential of a personality as an innovator of reality, whose social energy can transform information, knowledge, potential into driving force of national economic growth and welfare.

## References

1. A. Toffler, *Future shock* (Bantam Books, New York, 1991)
2. V.I. Blinov, *Professional'noye Obrazovaniye. Stolitsa*, **3**, 27–32 (2019)
3. M.M. Kovalev, G.G. Golovenchik, *Tsifrovaya ekonomika – shans dlya Belarusi [Digital economy: a chance for Belarus]* (Publishing Center of Belarusian State University, Minsk, 2018)
4. I.N. Demina, M.V. Shkondin, *Theoretical and Practical Issues of Journalism*, **5(2)**, 187–199 (2016). [http://dx.doi.org/10.17150/2308-6203.2016.5\(2\).187-199](http://dx.doi.org/10.17150/2308-6203.2016.5(2).187-199)
5. M.A. Erofeeva, I.V. Ulyanova, I.V. Plakhotnikova, Y.E. Kurilyuk, V.A. Egorov, I.G. Kochetkov, *Electron J Gen Med* **16(2)**, em112 (2019). <https://doi.org/10.29333/ejgm/108598>
6. L.A. Danchenok, A.S. Zaitseva, N.V. Komleva, *Open education*, **1(23)**, 34–45 (2019). <http://dx.doi.org/10.21686/1818-4243-2019-1-000-000>
7. F.I. Khramtsova, N.V. Vasilchenko, *International Journal of Humanities and Natural Sciences*, **5-2(44)** (2020). <http://dx.doi.org/10.24411 / 2500-1000-2020-10517>

8. F.I. Khramtsova, M.A. Erofeeva, A.I. Terekhova, N.N. Voroshilina, E.M. Andreikovets, *Revista San Gregorio*, **37**, 30–42 (2020).  
<http://dx.doi.org/10.36097/rsan.v1i37.1262>
9. Ministry of Economy of the Republic of Belarus, National strategy of sustainable social and economic development of the Republic of Belarus for the period up to 2030. (2017). Accessed on: December 20, 2020. [Online]. Available:  
<http://www.economy.gov.by/uploads/files/NSUR2030/Natsionalnaja-strategija-ustojchivogo-sotsialno-ekonomicheskogo-razvitija-Respubliki-Belarus-na-period-do-2030-goda.pdf>
10. D. Tapscott, *The digital economy: promise and peril in the age of networked intelligence* (McGraw-Hill, New York, 1995)
11. T.Ye. Pakhomova, Formirovaniye IKT-kompetentnosti studentov pedagogicheskogo kolledzha s uchetom mezhdistsiplinarnoy integratsii v usloviyakh tsifrovizatsii obrazovaniya [Formation of ICT competence of students of a pedagogical college, taking into account interdisciplinary integration in the conditions of digitalization of education], Thesis (Transbaikal State University, Ulan-Ude, 2020)
12. M.E. Porter, *Competitive Strategy* (Free Press, New York, 1998)
13. A.A. Vakhneeva, Ye.I. Davydova-Martynova, M.O. Zjuzjukova, *Open Education*, **21(6)**, 81–91 (2017). <http://dx.doi.org/10.21686/1818-4243-2017-6-81-91>
14. J. Loughran, *Teachers and Teaching*, **25(5)**, 523–535 (2019).  
<https://doi.org/10.1080/13540602.2019.1633294>
15. UNESCO, *ICT Competency Framework for Teachers* (2013). Accessed on: December 20, 2020. [Online]. Available:  
<http://www.unesco.org/new/en/unesco/themes/icts/teacher-education/unesco-ict-competency-framework-for-teachers/>
16. M. A. Choshanov, *Obrazovatelniye Technologii i Obshestvo*, **2**, 16–17 (2013)
17. A. Lukashenko, Decree by the President of Belarus No. 8 “On development of digital economy” (Belarus, 2017). Accessed on: December 20, 2020. [Online]. Available:  
<https://china.mfa.gov.by/uploademb/china/economy/digital/2018decree8en.pdf>
18. Security Council of the Republic of Belarus, *Postanovleniye Soveta Bezopasnosti Respubliki Belarus'. Kontseptsiya informatsionnoy bezopasnosti Respubliki Belarus'* [Resolution of the Security Council of the Republic of Belarus. Concepts of information safety of Belarus], National Legal Internet Portal of the Republic of Belarus, **7/4227** (2019). Accessed on: December 20, 2020. [Online]. Available:  
[https://pravo.by/upload/docs/op/P219s0001\\_1553029200.pdf](https://pravo.by/upload/docs/op/P219s0001_1553029200.pdf)