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CROSS-MULTIDIMENSIONAL SPACES AND ENVIRONMENTS AS A NEW REALITY OF EDUCATION

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Abstract

The article presents the concept of cross-multidimensional spaces and environments as a new reality of innovative education, a factor in the organization of educational activities in a comprehensive school in the modern conditions of its functioning, formation and development. The potential for innovative renewal and improving efficiency of educational activity by building effective dialogue models of its interaction with digital, innovative, technological, ethnocultural environments, axiological, semantic, event spaces. Particular attention is focused on the features of teacher pedagogical activities, educational and research activities of schoolchildren as subjects of cross-multidimensional relations. All this necessitates the staging and resolution of such an important scientific problem as the problem of innovative renewal of educational activities in the context of cross-multidimensional spaces and environments. The main idea can be formulated as the study of new phenomena of pedagogical reality, arising from the interaction and intersection of the educational environment with different spaces and environments. Taking into account the definition of "cross-multidimensional spaces and environments" the work considers various pedagogical situations, when a number of spaces and environments are at intersection, permanently affecting the educational environment. At the same time, the educational space itself also actively influences other spaces and environments (semantic, historical and cultural, axiological, network, architectural, geographical, etc.). Understanding the design mechanisms of the innovative educational process in a cross-multidimensional educational space determines the place and role of students and educators in this process.

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Keywords: Educational activities, educational environment, innovative educational environment, cross multidimensional space, multi-environment lesson, space and environment.

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1. Introduction

Modern changes in society, transformations in the economy and social sphere dictate the need to find and apply new approaches, tools that are adequate to the emerging realities. Particular attention is paid in this regard to education in general and to schooling, in particular as a sociocultural phenomenon, as a source of innovation, a factor of increasing production efficiency. The educational process in a modern school is really unfolding taking into account the action of such a phenomenon as cross-multi-dimensional spaces and environments, which we understand as a kind of situational or relatively stable set of integrated material and immaterial spaces and environments that allow to get multiplier effects from their intersection and interaction, providing the subjects of the educational process with additional opportunities to select the content of education, exit beyond social and educational interaction, personalization of educational routes. The organization of educational activities in these conditions creates new opportunities and limitations, necessitates the application of innovative organizational and pedagogical approaches, methods, forms and technologies, changes in style and professional thinking of educators.

Using the concept of cross-multi-dimensional spaces and environments can be defined the direction of innovative renewal of educational activities, professional-educational activities of the teacher, building a new didactic lesson, evaluated the potential to improve the quality of the school's operations and its effectiveness, sustainability to external challenges and changes.

2. Problem Statement

The efforts of the members of the vocational and educational community are multifunctional, increasingly complex and, in fact, a response to the changing space of this activity. Experiencing the full range of external influences, integrating and refracting them, educational activities significantly changes their configuration, increases the potential of impact on students. At the same time, there is often a situation when the rate of increment of such capacity outpaces the development of organizational structures, pedagogical systems; when management capabilities do not coincide with the complexity of the education systems being formed; when the correlated tasks are difficult to solve. All this necessitates the staging and resolution of such an important scientific problem as the problem of innovative renewal of educational activities in the context of cross-multi-dimensional spaces and environments. The main idea can be formulated as the study of new phenomena of pedagogical reality, arising as a result of repetitive and situational, manageable and stochastic interactions and intersections of the educational environment with diverse spaces and environments. We would like to draw attention to the unusualness of the problem. On the one hand, the average approach in pedagogy is no longer new (Baeva & Tarasov, 2017; Scheveleva, 2001; Yasvin, 2001), in our activities we take into account the complexity and versatility of this environment, on the other hand, analysis, consideration of this environment, as a rule, is carried out linearly, monocentric. This refers to the defining role of the educational environment. At best, we pay attention to the social and pedagogical context of education (Pinskaya et al., 2018), learn to use the potential of the digital environment for educational purposes (Hill, 2000; Rakitina, 1999). In a modern school there should be a space to mobile active work, and a space for intergenerational dialogue, peer communication, and space for entering the global world. S. V. Krivykh presented the interpretation of the concepts of

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"educational environment" and "educational space", gave them common ground, defined space-medium opportunities in the organization of education. The educational space is understood by them as a field of active interaction of three components: the student, the teacher and the environment between them. The educational environment is explored, interpreted as a set of information resources of the educational institution, learning technologies and educational process, which forms a full cycle of educational activity (Krivykh, 2011); as part of the sociocultural space, the zone of interaction of educational systems, their elements, educational material and subjects of the educational process. The educational space in a more general context is understood as a set of educational institutions, educational processes and educational environments. It is believed that the use of a set of education and education programmes within the educational space is a significant factor in social education; modeling the individual educational space of learners (Roder, Roder, & Drunger, 2017). In some works in the late nineties of the last century there was not only similarity of concepts, but also their non-synonymous. At the same time, in each case, one or the other concept is filled with a specific meaning, content. Thus, Talmy (2015) presented the specifics of space in the aspect of worldview and world modeling. Space, in its version, is similar to a cognitive model based on the function it performed in cognitive activity. According to the author, it is permissible to consider within the space of such mechanisms as: identifiable - categorizing and synthesizing. A large number of works in recent years are devoted to the study of the sociocultural environment, which is crucial in educational processes. There are quite a lot cases when specific types of spaces and environments are pointed out in the scientific and methodical literature. In particular, the work of Jakobson and Husseri (2016) presents the concept of "poetic space" in which the text combines the aesthetic activity of the producer (author) and the repitient (reader) into the whole poetic space (Jakobson & Husseri, 2016) .There are works on the study of semantic space (Langacker, 2015; Morgan, 2017; Talmy, 201; Wierzbicka, 2012). Subetto (2018) is developing a new scientific direction related to the disclosure of sociocultural, pedagogical potential of the noospheric space. Significant efforts have been made in recent years to quantify the quality of the educational environment of the school and pre-school institution. A number of international instruments have been developed and used to more or less adequately assess the parameters of such an environment (ECERS-R scales; SACERS) (Harms, 2017). The parameters of the educational environment are fixed by collecting contextual data in the course of international comparative studies of the quality of education, competences of the adult population, teachers:

PISA (Programme for International Student Assessment) - International Programme for The Assessment of Educational Achievement of 15-Year-Old Students (Mathematics, Reading, Science);

PIRLS (Progress in International Reading Literacy Study) - Study of reading and understanding of text - 4th grades;

TIMSS (Trends in International Mathematics and Science Study) - Study of the quality of mathematical and natural science education - 4th and 8th grades;

PIAAC - Programme for the International Assessment of Adult Competencies - Adult Competencies Study (it is of a continuous nature in proportion to PISA);

TALIS - Teaching and Learning International Survey is an OECD International Study of the Teaching Profession.

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Analysis of recent works in the field of education systems and the systematics of its terminology shows that paradigmatic knowledge has come close to understanding the organizational and medium cluster of didactics as a complex phenomenon caused by inclusion in the educational process of factors digital, virtual, sociocultural, other environments.

3. Research Questions

Appreciating the scientific back work and achievements of practice in the rendition, interpretation, expansion and giving of quality diversity to the educational environment, at the same time, unresolved issues are seen in the non-development of the terminology apparatus, as well as in the lag sway from the modern realities of the theory of cross-multidimensional spaces and environments as factors influencing the innovative educational activities, allowing to expand the space of pedagogical interaction, to include in the process of cognition new activities, event practices, use additional resources. When studying cross-multidimensional spaces and environments the following questions arise:

- whether there is a relationship between the educational environment and other multiple spaces and environments;
- is it possible to create the author's interpretation of the definition "space", "environment";
- what is the typology of educational spaces and what are the effective combinatorial connections between them.

4. Purpose of the Study

In this article we consider cross-multidimensional spaces and environments as a complex and multifaceted object of study, as a new reality of education.

Taking into account the definition of "cross-multidimensional spaces and environments" given in the introduction, in this paper we consider various situations where a number of spaces and environments are at intersection, permanently have an impact on the educational environment. At the same time, the educational space itself also actively influences other spaces and environments (semantic, historical, cultural, axiological, network, architectural, geographical, socio-cultural, event spaces, subject-spatial, production-professional, technological, innovative environment, etc.), resulting in the process of reproduction and assimilation of cultural samples, the formation of a value system acquires completely different properties, it is characterized by completely different aspects. It requires a research and a disclosure of the mechanisms, effects of interaction and intersection of different spaces and environments in innovative education, analysis of potential risks and negative consequences.

5. Research Methods

To achieve the goal of the study, we used methods to study the impact of cross-multidimensional spaces and environments on the processes of innovative renewal of educational activities. Methods of theoretical analysis and generalization, classification, as well as empirical methods (poll, observation) were chosen. In addition, the main focus of the article is on integrating, system-forming characteristics,

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manifested in the activities of the teacher in a cross-dimensional educational space. It is from these positions that the main methods used in the study are: system analysis, which allows to determine the methodological basis for improving the content of teacher training in the design of cross-multidimensional space; purposeful theoretical analysis of philosophical, psychological and educational literature from the point of view of the subject of our study; content analysis; analysis and generalization of the teacher's teaching experience of the teacher's training to design the learning process in a cross-multidimensional educational environment; survey.

6. Findings

We have researched the organization of educational activities in the conditions of cross-multi-dimensional spaces and environments. It has been established that the relationship of the educational environment with other numerous spaces and environments creates new opportunities and limitations, causes necessity to use innovative organizational and pedagogical approaches, methods, forms and technologies, changes in the style and professional thinking of educators. The result of the theoretical analysis of the studied problem was the author's interpretation of the definitions "space", "environment," their properties, distinctive features based on the signs of multidimensionality - one-dimensionality, subjectivity and outline of boundaries; scientific idea of the interaction and intersection of different spaces and environments, resulting in different combinations and connections The typology of spaces and environments has been proposed. The given ideas, regulations, typologization will be considered below in more detail. In the case of educational organizations of general education, the most effective combinations and combinatorial connections of the educational environment within its cross-multidimensional interaction with other spaces and environments have been identified. The potential for innovative renewal and efficiency of educational activities by building effective dialogue models of interaction of its participants with digital, innovative, technological, ethnocultural environments, axiological, semantic, event spaces has been revealed**.** You can name a number of spaces and environments that have numerous connections and intersections with the educational space. On a case-by-case basis, individual ones are important and should be taken into account in the aspects of organizing and innovatively updating educational activities and ensuring the quality of education. For example, the subject and spatial environment is essential for children with disabilities, for the organization of mobile activities of students. Semantic space is actively used in the organization of theoretical learning, the development of the fundamental core of knowledge. The use of elements of the production and professional environment is an important prerequisite for organizing effective professional orientation work, creating profile classes. The axiological space is crucial in determining the content, forms and technologies of educational work, creating a positive organizational culture of the school. Educational and research activities in a modern school are unthinkable without relying on elements of innovation and technological environment, network space ("Fablab-laboratories", nanolabs, Internet things laboratories, etc.). Geographical space is important for positioning school, choosing strategies for its network interaction and external relations. Extracurricular activities, project and research educational activities of students are often carried out outside the school space, suggest "exit" beyond its borders. For example, one of the authors of this article K.A. Elistratova, a teacher of Russian language and literature, in the course of extracurricular activities on the course "Computer linguistics" uses the method of projects based on augmented reality technology. The use of

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event space is carried out in the form of the environmental volunteer movement "Children of the Green Planet," the "Fans of Photography" club, as well as school forestry, whose activities are organized on a specially selected and pinned territory in the forest area. In the course of our research, we identified the signs and properties of cross-multidimensional spaces and environments: alternative, modality, coherence, dynamism.

Alternatively, it assumes that a space, environment can be replaced by others with the same functional properties, the possibilities of pedagogical influence.

The modality of space, the environment means betting on a certain aspect of their application.

The coherence property allows you to harmonize the application of two or more spaces and environments, achieving the greatest effect from their application.

The dynamics of spatial and environmental phenomena are associated with a change in their basic properties, essential characteristics, which requires the subjects of educational activity to respond in order to prevent the decline of their pedagogical potential.

Addressing the challenges of innovatively updating educational activities using the potential of cross-multidimensional spaces and environments requires addressing the issue of typologization of such spaces and environments. The reasons for highlighting the types of spaces and environments were the enormity; correlate with the educational environment; stability of basic parameters and properties; forms of existence.

The position of scale involves consideration of cross-multidimensional spaces and environments from the perspective of quantitative, voluminous characteristics of their length, prevalence. In this context, they can be presented as global, meso-sized and local.

An important reason for highlighting the typology of cross-multidimensional spaces and environments is the stability of their basic parameters and properties. It is logical to assume that there may be stable formations of several intersecting, mutually complementary spaces and environments, relatively stable (quasi-stable) and multidimensional transit-type formations, when under the impact of any factors their composition changes, configuration, functional properties.

In the process of interaction, intersections of spaces and environments, complex structures are formed from real and virtual, stable and dynamic objects, subjects and processes. In particular, the following varieties and combinatorial schemes of intersections of spaces and environments with the inclusion of educational environment can be noted: cultural and historical environment - technological environment - axiological space, etc.

As a result of crossing spaces, environments and fields, situations are possible and often take place: capsalization, artificial insulation of channels that can potentially nourish each other and logically complement each other; sound phonies; expansion, which, for example, can lead to devaluation, erosion of traditional values; inadvertently obtaining mix-educations from uncorrelated constituents (liberalism in educational policy and attempts to protect against it by introducing the subject "Basics of the Spiritual and Moral Culture of the Peoples of Russia") into the school curriculum.

Understanding the design mechanisms of the educational process in a multi-dimensional educational space allows to adequately determine the place and role of students and the teacher in this process, create conditions and select effective technology to develop design knowledge, skills and competencies in demand

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for universal learning. Thus, in the study activity, immersion in cross-multidimensional spaces and environments contributes to the nuance of learning ideas about the images of the world (subject aspect) and the ways of world vision (cross-multidimensional aspect).

In 2018, a series of multi-medium lessons and classes in the system of extracurricular activities was held with students of the 8th grade of cadet classes, as a result of which they were immediately immersed in several interconnected spaces and environments: 1) historical and cultural space (cultural and historical environment of the 18th century: work with works of art, historical events, world art attractions); 2) network space (creation of cultural-historical project on the resource Google-disk "Cultural-historical era of Peter I"; work with electronic libraries, cases); 3) geographical environment (interaction and exchange of knowledge and skills with peers from other countries, Russian regions - Finland, Yekaterinburg, Kaliningrad).

Multi-dimensional analysis and use of empirical methods (observation, survey) of multi-medium lessons and classes revealed that students: (a) expanded the range of perceptions of reality needed to become self-aware - 97.8%; b) demonstrated interest in the subject of multi-medium lessons and lessons - 95%; (c) noted the practical importance of lessons and lessons - 90%; d) assessed the effectiveness of multi-medium lessons and classes in terms of the formation and development of subject, personal and meta-subject results - 98%.

7. Conclusion

As a result of the numerous interactions and intersections of the educational environment with other spaces and environments within cross-multi-dimensional formations of different types, there may be a number of phenomena and negative consequences, which undoubtedly should be taken into account in innovative educational and pedagogical activities. Among them are:

- globalization and cross-border interaction;
- transfer of educational strategies, interaction and expansion of pedagogical cultures (we believe that there may be types of interactions such as borrowed-adaptive; parity-dialogue; interaction oriented at conservation of Individual uniqueness);
- -increasing the heterogeneity of the educational environment, its complexity and alternatives;
- complicating assessment, rationing, regulation, management;
- deformation of the true quasi-pluralism; use of dubious dominants and attitudes, false concepts (e.g. the concept of "common human values").
- the occurrence of multi-institutional communities (multi-age, network, etc.).

In this regard, further research is needed in this area, including experimental studies, including assessments of the effectiveness of individual practices, models, technologies driven by the cross-multidimensional factor of spaces and environments.

Consideration of the phenomenon of cross-multidimensional spaces and environments as a new reality of education, from a practical point of view, is important in the context of a full transition of general

education to a competent model, when meta-subject potential of the student's personality, the graduate of the school is of particular importance.

Using the powerful potential of sociocultural, innovative, technological environments, axiological, noospheric, event, network spaces, other spaces and environments allows to solve innovative learning at a higher level, educational and developing tasks, creating a new quality of Russian education, forming the human capital of the 21st century.

The issues raised in this article, the considered questions are ambiguous and need further study. The judgments, provisions and assessments expressed are an invitation to dialogue.

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