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Subject-Generated Environments as the Basis for the Formation of a Personal-Developing Digital Educational Environment / Субъект-генерируемые среды как основа формирования личностно-развивающей цифровой образовательной среды

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Аннотация: В статье рассматриваются особенности формирования личностно-развивающей образовательной среды в условиях глобальной цифровизации. Раскрывается понятие цифровой образовательной среды (далее – ЦОС) в контексте ее личностно-развивающего характера, обосновывается принципиальная схема функционирования субъект-генерируемых сред в цифровой образовательной среде, выделяются факторы, определяющие личностно-развивающий потенциал цифровой образовательной среды, а также особенности деятельности педагога по формированию развивающей среды цифровыми средствами в преломлении традиций и инноваций. Традиционное понимание образовательной среды вследствие цифровизации подвергается значимой трансформации. Исследование показало, что формирование развивающей цифровой образовательной среды должно осуществляться с обязательным акцентом на субъект-генерируемые характеристики среды, разрешая противоречие между множественностью и открытостью потенциально развивающих ресурсов, с одной стороны, и неопределенностью, неочевидностью результатов взаимодействия субъектов, с другой стороны. Для педагога цифровая образовательная среда выступает дискретным образованием, тогда как для обучающегося она является единым структурированным цифровым пространством (единой средой). Деятельность педагога по формированию развивающей среды цифровыми средствами, придание ей развивающих функций связаны с педагогической компетенцией по наполнению среды соответствующим ситуационно-событийным контентом, способствующим генерации сред в образовании самими обучающимися и наполнением их аутентичным смыслом. Указанные компетенции педагога зависят от полноты теоретического осмысления особенностей возникновения субъект-генерируемых сред в цифровой образовательной среде. Научная новизна заключается в том, что впервые личностно-развивающая цифровая образовательная среда рассматривается через понятие субъект-генерируемых сред, выводящее личность обучающегося в центр соответствующих образовательных проектов. Развитие личности обучающегося в ЦОС представляется многофакторным и открытым субъект-зависимым процессом с вариативностью ресурсов для самоизменения, исследовательское отношение к которым соответствует постнеклассическому этапу развития науки.

Ключевые слова:

субъект-субъектное взаимодействие, субъект-содержащие системы, системный подход, личностно-ориентированное образование, цифровизация, развитие личности, образовательная среда, педагогические компетенции, ситуационно-событийное наполнение, педагогическое проектирование

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Introduction. Digital transformations significantly change the structure and content of the modern education system. Within the framework of the National Education Project, which implements the national goals of the Russian Federation, the "Digital Educational Environment" project is being created, which is aimed at introducing a digital educational environment in educational organizations to ensure the digital transformation of the education system [1]. Since 2020, the state information system "Modern Digital Educational Environment" (SCES) has been created for educational institutions of higher education based on an information resource (portal) that provides "one-stop-shop" access to online

courses implemented by various educational platforms [2]. Despite the active work on equipping organizations with modern equipment and developing digital services and content for the educational process, the growth of quantitative indicators of digitalization does not unconditionally and automatically solve the problem of endowing the digital educational environment with personality-developing qualities. The goals and objectives of its creation should not contradict the main purpose of education as a single and purposeful process of education and training for human development.

Modern researchers recognize that the realities of the modern socio-cultural environment include ideological disorientation of the individual, which is a consequence of the contradiction between the cultivation of the principle of humanism in all spheres of social life, the primacy of the individual, their rights and freedoms, on the one hand, and the increasing loss of individuality, life paradigm, due to the consumption of unified mass stereotypes. On the other hand (N.A. Winter[3], J.N. Vypryazhkina [4], etc.), according to N.B. Kirillova, the blurring of the identity of the "I" is one of the characteristics of the cultural paradigm of modernity [5, pp. 279–280]. The information society's externally developed form of "freedom" hides its incomplete content: personal disunity and loss of socially significant personal meaning.

Education, as a multidimensional socio-cultural phenomenon characterized by multitasking and multifunctionality, can solve most of the above contradictions under certain conditions. However, attempts to reproduce subject-object relations and personal-non-mediated educational forms and methods in the digital educational environment, traditional for the wide practice of domestic education, are not only ineffective but also impossible by definition of personal-developing pedagogical interaction. The problem of inconsistency of traditional pedagogical tools with the conditions of global digitalization of education is the basis of this study.

The purpose of the work is to reveal the features of the formation of a personal and developing digital educational environment in the context of global digitalization based on the design of subject-generated environments. **Research objectives**: to reveal the concept of the digital educational environment (hereinafter referred to as the DEE) in the context of its personality and developing nature; to substantiate the design features of the subject-generated environments in the digital educational environment and to identify the factors determining its personality and developing potential, and determine the features of the teacher's activity on the formation of the developing environment by digital means in the refraction of traditions and innovations.

Methods: Analysis and generalization of pedagogical experience, systematic approach, contextual semantic analysis, etymological analysis, and synthesis of interrelations in the process of object-subject area research.

The scientific novelty lies in the fact that, for the first time, a personality-developing digital educational environment is considered through the concept of subject-generated environments, which brings the student's personality to the center of relevant educational projects. The development of the student's personality in the DEE seems to be a multifactorial and open subject-dependent process with variability of resources for self-change, the research attitude corresponding to the post-non-classical stage of the development of science.

Research results.

1. A refined interpretation of the concept of "digital educational environment" in structural and content: from a digital space consisting of an open set of information systems that unite all participants in the educational process to personality-oriented environments in digital (virtual) reality with a mandatory emphasis on the subject-actualizing characteristics of the developing environment in conditions of multiplicity and openness of resources, uncertainty and non-obviousness of the results of the interaction of subjects.

2. The effectiveness of the pedagogical design of conditions for the creation of subject-generated environments by the students themselves determines the factors of the personal-developing potential of the digital educational environment. At the same time, from the position of the teacher, the DSP acts as a discrete education, and for the student, such an environment acts as a single structured digital space (a single environment) conditioned by the subjective principle.

3. The activity of a teacher in the formation of a developing environment by digital means, giving it developing functions associated with the competence to fill the environment with appropriate situational and event content that contributes to the generation of educational environments by students, as well as filling them with authentic meaning.

Discussion. In the legal documents regulating the creation and functioning of the digital educational environment, this definition is not expressed clearly enough. The Federal Law "On Education in the Russian Federation" fixes the concept of an electronic information and educational environment (hereinafter, EIOS), which is necessary to implement educational programs using exclusively e-learning and distance learning technologies. Such EIOS should include electronic information, educational resources, information technologies, and technological means. The modern digital educational environment that is being actively created today is, in fact, a storage device for online courses on various educational platforms (the terminology is used in accordance with the Regulations on the state information system "Modern Digital Educational Environment"). As S.S. Kravtsov points out, "The digital educational environment is a help, a strengthening of the traditional education system." He states that the DEE is necessary for communication between the teacher and the student; it acts as a social network and contains electronically verified educational materials [6]. In other words, the DEE acts in the established meaning as a digital space consisting of an open set of information systems that unite all participants in the educational process.

Naturally, the definition of DEE does not contain all the key characteristics of the phenomena of reality reflected in this concept, as it focuses exclusively on the structure and content of the definition. It is important that even in this form, the specified definition requires correction in terms of the use of the concept of "space" in it. Acting as the ultimate category, the basis of everything that exists, space "indifferently" includes all the many objects, regardless of the subject, a specific person. In a philosophical sense, the allocation of the environment is inextricably linked with the appearance of the subject relative to which this environment is allocated. The environment is a part of the space structured relative to the subject. This important remark brings the student's personality to the center of any education model in the digital educational environment if they claim to be personality-developing.

A priori, starting from the personality-oriented nature of education, it is necessary to fix that the student's personality should become an appropriate system-forming factor that requires modeling special connections in such a subject-containing system. A new understanding of the subject-containing system in the digital educational environment leads

us to conclude that the concept of a subject-generated system is involved in the conditions of diversity and openness of resources, uncertainty, and non-obviousness of the interaction of subjects in a weakly deterministic environment. These conditions are characteristic of a completely new paradigm, according to V.M. Eskov and other scientists—"the third paradigm in psychology," not a traditional system in the understanding of determinism stochasticity, but "a system of the third type (CTT)—organized complexity," which includes, first of all, "man, his psyche, neural networks of the brain." The general characteristic "lack of stability" refers to the specific properties and principles of the STT organization. "This is a world of unpredictable and unstable systems ... unique systems" [7].

In modern conditions, the traditional values underlying personal development are changing. The digital information world order, the trend of digitalization of society "condenses" the subjective passage of time, saturating human life with new meanings and personal events, which often leads to a weakening of the significance of the experience of previous generations to a loss of continuity with them, to an ambiguous assessment of traditional socio-cultural values (Yu.V. Strigunov [8], D.Yu. Vagin [9] etc.). Along with the transformation of time, the subjective perception of another traditional dimension of human existence—space—is changing. Being at the heart of personality-driven environments due to active digitalization, the space loses its fundamental nature and is virtualized. At the same time, boundaries are expanding, and the intensity of interconnections in such virtualized environments is growing. Network information structures, becoming a full-fledged way of social organization at the interpersonal, group, and social levels, push the traditional local framework of human activity, contributing to interpersonal communication and the dissemination of not only and not so much traditional forms of culture as their individual and group interpretations, compilations of cultural artifacts. As Jean Baudrillard points out, in a consumer society, objects replace communication, and information abolishes knowledge [10]. The process of globalization, which carries multiculturalism and the unity of the diversity of cultures, implies a positive potential for social and personal development. However, the threat of an undesirable transformation of traditional spiritual and personal values of both an individual and the entire Russian society is still more tangible.

The classical vertically constructed scheme of interaction between a teacher and students in digital environments significantly loses its properties in relation to the function of directed subject-object influence. The personality of the student in the conditions of the DEE is less amenable to the direct traditional influence of the teacher. A significant number of researchers point to similar features of educational activities through the DEE. Thus, the study of modern pedagogical experience shows that students have difficulty understanding the "target, structural-content, moral-value components of information" [11]. Moreover, digital learning ("digital didactics") already has its own special principles—these are, according to M.E. Weindorf-Sysoeva and M.L. Subocheva, the principles of globalization, query-oriented learning, and futural orientation [12]. The problem of improving the quality of education is actualized (J.M. Lodge with co-authors [13], M.G. Sorokova [14], etc.) by the problem of the safety of the educational environment and its components (B. Lorenz with co-authors [15], I.M. Azhmukhamedov [16]) and others.

The existing interpretation of the DEE as a set of educational content, software, and hardware does not fully disclose the content of the personality-oriented approach in education. In fact, such an interpretation of the educational environment, based on the classical scientific paradigm that opposes the subject (the person in his activity, personality) and the objective world, is characteristic of the reductionist-deterministic

system approach. In understanding the specifics of the digital educational environment, we are in solidarity with Professor O.N. Shilova, who considers the DSP from a pedagogical standpoint as "a complex of relations in educational activities mediated by the use of digital technologies and digital educational resources, contributing to the realization by the subjects of the educational process of opportunities for the development of culture, ways of self-realization, building social relations aimed at the formation of responsible digital behavior a citizen of modern society" [17].

Currently, the personality-developing characteristics of the DEE are defined through a category that carries only the potential for development, namely through the concept of "conditions." At the same time, the potentiality of the conditions of personal development makes the DEE a vaguely defined concept in the context of its developmental properties. Most often, the developing mechanism in any educational environment, including in the DEE, refers to subject-subject pedagogical interaction. The specific prerequisites for the emergence of such interaction between the teacher and students in the DEE are also insufficiently defined. The validity of such a conclusion becomes especially obvious in modern digital realities when the classical, historically developed classroom-class and lecture-seminar forms of educational organization are transferred to the digital environment.

Personality-developing educational projects developed today by the author's teams in various research schools face risks in the course of their implementation in a wide pedagogical practice associated with low motivation of the conservative professional and pedagogical environment, insufficient qualifications of the teaching staff, the need for resource provision for such projects, etc. Indicative, for example, is the analysis of the "Collection of cases of the best practices of supporting universities in Russia," presented within the framework of the inter-university forum "Supporting Universities—drivers of regional development" [18] with the participation of 25 state universities. "Supporting Universities of Russia" pays insufficient attention to the issues of DEE design in general and personal development models and technologies in particular, which is puzzling.

Among the well-known projects for the implementation of the educational environment by digital means, the technology of network communication stands out, which, according to P.N. Bilenko and co-authors, is "the basis for the implementation of other pedagogical technologies of digital education," distance learning technology, complex case technologies, "blended learning" technology, technology for organizing project activities of students and others [19, pp. 39–44], etc.

At the same time, the personal-developing potential of the digital educational environment is determined not so much by the subject content of the material but by the possibility of forming personal qualities based on it that remain relevant to the individual throughout his life. Proceeding from the above, in pedagogical projects, including those implemented through DSP, it is important to distinguish between the technological component, which acts as a subject prerequisite for developing pedagogical interaction, and the indicative basis of the teacher's activity, thanks to which subject-conditioned communication arises. Interpersonal communication, accompanied by indirect, environmental forms of interaction between the teacher and students, creates event-based forms of joint existence (co-existence) of subjects of educational relations.

Variability, lax certainty, and relative, subjectively perceived independence of the subject's "being" in the DEE determine the possibility of the emergence of subject-generated

environments within the framework of educational relations. Subject-generated environments are formed on the basis of subject-subject interaction and students' personal choices. A characteristic feature of such a subject-generated environment is the flexibility of personal interaction, the possibility of a social multi-role experiment coming from the personality itself.

The openness of the educational environment, accompanied by communicative dynamics, the selectivity of the subject-generated environments, and other factors make the pedagogical design process atypical and unconventional in terms of the emergence of authentic environments. In addition, under the influence of digitalization, the traditional concepts of personal identity and social interaction for personal development, such as a significant Other, friend ("friend"), and others, are transforming. As a consequence, the activity of a teacher in the DEE is due to the complexity of pedagogical forecasting of educational results, including in terms of insufficient development in pedagogy of the relevant tools for the formation and evaluation of personality-driven competencies.

Thus, the main premise for constructing a schematic diagram of the functioning of a personality-developing digital educational environment based on subject-generated environments is the subject-centered position of the student. The main task of a teacher in environmental interaction is to project this subject-centered position onto the educational process by "indirect" methods. The success of such a method of obtaining personal experience by students is determined by the ability of the teacher to involve them in the world of objectified norms and values to contribute to the refraction of generated media through socio-cultural maxims. In turn, the personal development potential of the DEE directly depends on both the success of the creation of subject-generated environments by the students themselves and on the effectiveness of the teacher's further activities in environmental forms of pedagogical interaction.

Structurally, from the position of a teacher, the DEE acts as a discrete educational environment with a multi-component character for it—digital educational content and the subject content of academic disciplines, network educational platforms, necessary technical means, etc. Meanwhile, for the learner, such an environment is one and indivisible; the learner perceives it as a digital (virtual reality) given in personal perception. From the subject-activity point of view, the educational environment is a feasible way for the student to structure the digital space. In this context, a "meeting point" of the personal beginning with significant others arises in the DEE, where it becomes possible to identify others as significant for the student (Fig. 1). Such a pedagogical project aimed at creating subject-generated environments is further focused on filling the environment with appropriate situational and event content.

Fig. 1. Scheme of interaction of subject-generated environments in the digital educational environment

The innovative functions of a teacher as a specialist in the field of digital tools and technologies, which scientists fix as specific to the digital educational process (P.N. Bilenko and co-authors [19, p. 56]), seem obvious. More specific functions of a teacher as a subject of designing a digital personality-developing educational environment include the ability to organize and regulate the level and intensity of interaction between education subjects, which will determine the nature of the learning system (adaptive, intensive interaction, etc.). Thus, the role of a teacher in a digital educational environment should be rethought—not downplayed, not put in subordination to global digitalization, namely rethought. Today, the role of the teacher is refracted in the trends of innovation that put traditional

pedagogical means to significant tests (Table 1).

Table 1

Prerequisites for the formation of a personal development environment by digital means in the activity of a teacher in the refraction of traditions and innovations No. p / p

	Innovative prerequisites	Traditional background
1.	Designing forms, teaching methods, working materials, diagnostic and evaluation tools based on the digital educational environment creates broad developmental opportunities	The teacher loses the status of the sole carrier of knowledge and information, giving way to the digital environment
2.	Development of a scenario of a training session based on diverse, changing forms of organization of educational activities and the optimal sequence of the use of digital and non-digital technologies	The role of the teacher as the only "arbiter" in the learning process is weakening
3.	Combining different life environments of the modern digital generation of students – virtual and real - contributes to the adaptation and development of the student in the real social and professional world	The teacher is not sufficiently prepared to monitor students, integrating assessment activities in the real and digital environment
4.	Organization of individual and group educational communication in the digital environment, reflection and discussion of personally significant experience	The interpersonal "live" interaction of the subjects of education is weakening
5.	Creating educational motivation among students using interactive mediated communication	Creating educational motivation among students as a carrier of the role image of a "successful professional" using facilitation tools through pedagogical interaction based on direct communication
6.	Maintaining the current state of the content of electronic educational resources corresponding to modern scientific and technical knowledge	Difficulty in updating scientific and technical knowledge and information as a result of the natural obsolescence of professional knowledge and technology

These innovations are not exclusively related to information technologies. They bring us back to understanding, including the "pre-digital" phenomenon of personal development in an educational environment. This environment carries potential conditions for the subject to generate its own semantic coordinate system. The digital educational environment may

contain means for automatic adaptation of the learning process based on the individual characteristics of each subject, taking into account the order, method, and pace of providing educational material and the level and nature of teacher support [20]. However, the developing functions of such an environment are not automated nor algorithmized; they are related to the teacher's competence in filling the environment with appropriate situational and event content. The teacher organizes the student's activities in a developing environment with the possibility of quick feedback in the learning process, creating motivation for the full assimilation of the set results. At the same time, the expected competence of a teacher is not only the ability to work in digital environments, in new and constantly changing conditions, using the latest virtual educational resources, but also having experience in solving pedagogical tasks quickly with the construction of remote effective communication.

Conclusion. The personality-oriented nature of education can be truly embodied through the digital educational environment. However, this potential characteristic of the digital educational environment remains unfulfilled. Traditional educational models are undergoing significant transformation due to digitalization. The predominance of new forms of activity that correspond to the modern digital reality determines the need to form up-to-date tools for the teacher, including designing a personal-developing digital educational environment. The specified competencies of the teacher depend on the completeness of the theoretical understanding of the peculiarities of the emergence of personality-conditioned environments. The personal-developing potential of the digital educational environment corresponds to creating conditions for the generation of authentic educational environments by students.

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