European Proceedings of
Social and Behavioural Sciences
EpSBS

www.europeanproceedings.com
e-ISSN: 2357-1330

DOI: 10.15405/epsbs.2021.11.226

SCTCMG 2021
International Scientific Conference «Social and Cultural Transformations in the Context of Modern Globalism»

CREATIVE COMPONENT OF THE DIGITAL MODEL OF HIGHER EDUCATION

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Abstract

The development of the digital economy in Russia actualizes the problem of modernization of higher education in the direction of building individual learning paths. This goal is achieved through the creation and development of digital technologies. The analysis of the implemented digital educational models showed the predominant use of linear models. A characteristic feature of linear models is the sequential presentation of educational material with step-by-step control. Such models do not fully take into account the implementation of the creative component. In order to train a specialist with modern research competencies, we have developed a dynamic digital learning model thus paying special attention to its creative component. The central link within the content of the creative component is transdisciplinary tasks, which represent a holistic vision of the subject of study. The solution of transdisciplinary problems encourages students to address various subject areas, the knowledge structures of which are concentrated in the disciplinary cases of the model. The creative component of the dynamic digital learning model contributes to the development of personal identity and creativity of students. This model enhances the creative component of the digital education process. The paper presents the results of the empirical study conducted at Moscow State Regional University, which shows the effectiveness of the developed model. The study included the ascertaining experiment, development and implementation of a system of transdisciplinary tasks and the formative experiment. Finally, the paper drawn the conclusion on the advantages of using a dynamic digital learning model compared to a linear model.

Keywords: Digital educational environment, digital learning model, creative component, transdisciplinary tasks

https://doi.org/10.15405/epsbs.2021.11.226
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1. Introduction

A modern educated person should have the ability to interact in a professional community, be creative and able to solve non-standard situational problems. These skills have become key components in the competencies of future specialists of the 21st century. Specialists' training requires educational models relevant to modern digital challenges. The creation of such models in Russia is regulated by the state project "Modern Digital Educational Environment", one of the goals of which is to ensure the possibility of educating citizens by building an individual educational trajectory regardless of time and place.

To realize this goal, new and improved existing online learning platforms are being created on the basis of various software platforms. Higher educational institutions evaluate the creation of their own electronic educational environment as a fundamental phenomenon in the organization of the educational process. The current challenge is to identify the structure and content of the digital learning model components. Due to the major spread of COVID-19, the solution to this problem has become one of the significant conditions for the implementation of the educational process at higher educational institutions.

Adhering to the position of the authors of the draft didactic concept of digital professional education and training, the digital educational environment is understood as the system of conditions and opportunities, which implies the information and communication infrastructure and provides a set of digital technologies and resources for training, development, socialization, and education (Blinov et al., 2019). Modern digital educational resources include layer-by-layer synthesis of objects, virtual reality mechanisms and artificial intelligence tools of both declarative and procedural types (Solovov & Menshikova, 2021). The digital educational environment is formed through the interaction of participants in the educational process, the important components of which are as follows:

- establishment of a cognitive module;
- development of personal identity and creativity of students (Runco, 2016);
- reflection of educational results (Vysotskaya et al., 2020).

Our research focuses on the study of the creative component of the digital learning model.

2. Problem Statement

The problem of the study is the development of a digital learning model that contributes to the development of creative qualities of students' personality.

3. Research Questions

The key concepts of the study are as follows: digital educational process, digital educational model and its creative component.

1. The digital educational process is understood as a specially organized process of educational activities of students "aimed at the full acquisition of knowledge/ skills and competencies based on the use of digital technologies with a motivating, facilitative, organizational and mediation role of a teacher" (Blinov et al., 2019, p. 62).

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2. The digital educational model is the development of a tree of objectives for achieving educational results, concretization of functions performed by participants in the educational process and design of a digital structure for the fulfillment of intended objectives.
3. The creative component of the digital learning model is characterized by the ability of students to overcome cognitive difficulties, independence of cognition and non-standard professional decisions, to defragment and compile a new intellectual product, to synthesize research experience (Sternberg, 2006).
4. The most common and easy to implement is the linear digital learning model, in which the information are defined sequentially with step-by-step control of acquired knowledge. The condition for transition to the next block is the success of the control module. If it fails, the system returns the user to the previous theoretical block. Such a model is effective at the initial stage of training in the formation of basic knowledge and algorithmic skills. However, the implementation of the creative component requires a modification of the above-described linear model, the structure of which is presented in Figure 01.

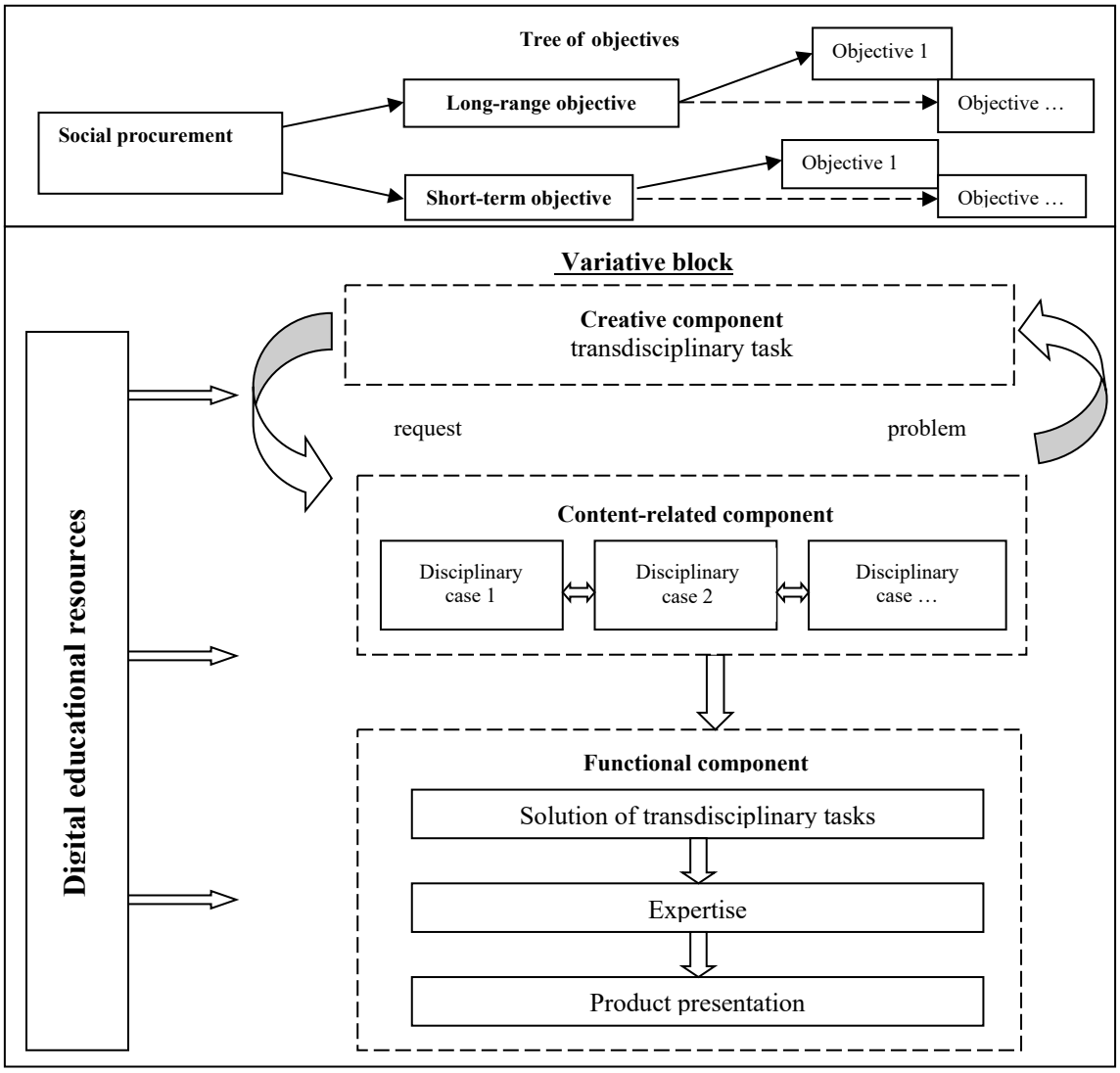

Figure 1. Dynamic digital learning model

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A transdisciplinary task is a task characterized by the transfer of cognitive schemes from one disciplinary field to another, the development and implementation of joint research projects, during which a holistic vision of the subject of the study is created (Knyazeva, 2011). Such tasks correspond to the professional orientation of student training, are designed by the teacher, are located in the digital educational environment of the university, and their solution requires the interference of knowledge from different disciplines. For example, in the context of teacher training, a transdisciplinary task is designed that describes professional situations of pedagogical communication, when not all participants in the educational process demonstrate the adoption of a cooperation mode, the proposed content of training during a class. The problems that arise in this situation require future teachers to comprehensively apply knowledge and skills from the disciplines of various blocks.

The process of solving a transdisciplinary task takes place in a free research mode on the basis of the independence of thinking and is similar in nature to certain professional activities. The transdisciplinary task is included in the active intellectual activity to transform the selected information from those disciplinary cases that are necessary to solve the problem. Case content is determined by the situation described in the task and may contain electronic textbooks of a specific field of knowledge, graphic, audio or video materials, virtual laboratories with mathematical models of studied objects or processes, links to websites, hyperlinks, digital collections, and other media content (Sclater, 2010). Due to the specifics of the digital environment, the information content of disciplinary cases is characterized by completeness, limitlessness and relevance. In the presented model, the teacher does not dominate the educational process, but plays the role of a moderator and an expert, and motivates students to think independently and creatively (Mishra & Singh, 2017).

4. Purpose of the Study

The purpose of the study is to develop a dynamic digital learning model, highlight its components, characterize the elements of the creative component.

5. Research Methods

The work analyzed and summarized the concepts of digital modeling of higher education aimed at personalizing the educational process, analyzing the results of educational activities, and utilized the methodology S. Mednik's Remote Associates Test (RAT) (adapted by A.N. Voronin, adult version), statistical methods of data processing, content analysis.

6. Findings

The study was conducted at Moscow State Regional University. The sample included 169 people – students studying *Pedagogical Education*, profiles: *Mathematics* and *Mathematics and Computer Science*. The study was conducted in three stages. At the first stage, the ascertaining experiment was conducted, during which the level of creativity of thinking was determined using the S. Mednik's Remote Associates Test (RAT) (adapted by A.N. Voronin, adult version) (as cited in Druzhinin, 2000). At the

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second stage, the system of transdisciplinary tasks was developed and implemented based on extensions and successive generalizations, using the digital educational environment (DEE MSRU) taking into account the levels of creative thinking identified at the first stage. At the third stage, a forming experiment was carried out after the implementation of the proposed task system, confirming its effectiveness. The significance of trait differences was confirmed by the Student's t-test. Then, methodological recommendations were compiled within the framework of the digital model of higher education described in the work.

The results of the study are presented in Table 01.

Table 1. Level of creative thinking according to the S. Mednik's Remote associates test (RAT) (adapted by A.N. Voronin, adult version)

Creative thinking levels	Average score of conditional "originality" of the subject before the implementation of the transdisciplinary task system, %	Average score of conditional "originality" of the subject after the implementation of the transdisciplinary task system, %
Original, 0.95–1	4	5
Peculiar, 0.91–0.94	0	3
Non-standard, 0.86–0.90	4	8
Moderate, 0.81–0.85	4	7
Standard, 0.62–0.8	40	55
Simple, 0–0.61	48	22

7. Conclusion

A dynamic digital learning model highlighting a creative component was developed. The content-related part of the creative component identifies transdisciplinary tasks as a central element. The efficiency of using this model in the educational process at higher educational institutions is shown.

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