

**ICHEU 2021****International Conference «Humanity in the Era of Uncertainty»****SYSTEM OF NON-LINEAR EDUCATION FOR THE  
SUSTAINABLE DEVELOPMENT OF REGIONAL COMMUNITY**

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**Abstract**

Theoretical and methodological understanding of the concept of "non-linearity" in pedagogical education from the standpoint of social and regional practice has been carried out. The article depicts the peculiarities of constructing the system of non-linear education (environment, forms, methods, means, and technologies) taking into account the main trends of the sustainable development of the region. The features of nonlinear education as a specific system based on global and regional challenges have been revealed. Theoretical and practical elements of constructing have been used in the process of training master students in the discipline "Topical issues of science and education" and bachelors in the course "Pedagogy". The system of integrated tasks has been prepared. Future masters and bachelors participated in developing methods of study, application of ICT technologies, helped to develop modules in different areas (humanitarian, natural-scientific, socio-economic) taking into account the ideas of the sustainable development of the region. The content of the modules has been tested during different lessons by integrating forms (class lessons, lectures, seminars); distant and digital technologies ("Face-to-Face", "Rotation Model", "Online Lab" etc), that created loyal relations, interactive content, positive attitude and high motivation to studies.

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## **1. Introduction**

The purpose of the study is to construct the system of non-linear education taking into account the main trends in the sustainable development in the region as means of life activity of a present and future student.

## **2. Problem Statement**

Understanding the concept “non-linearity” of pedagogical education is important from several positions. From the point of view of the social practice, non-linear education prepares the subjects of education for further life. From the point of view of pedagogical training, it involves ideas of non-linearity into educational activity and positions ideas’ role in the region’s development. From the point of view of the regional practice, regional components (resources, parameters, intercultural relations) have been considered to include them into the non-linear character of teaching and educating the new generation.

## **3. Research Questions**

Let us have a look at some aspects of non-linear education. Let us note that the importance of non-linearity of education is connected with the creation of the open society, a society without borders (Akulova, 2011). The key principles of non-linearity are openness, freedom. We will consider them as strategic guidelines, creating a Common Educational Space for fulfilling all possibilities of the participants and receiving information-education resources by each subject, which is topical in North regions.

## **4. Purpose of the Study**

An important fact should be mentioned that non-linear education within its openness, globality, freedom, requires new technologies, however, a classical learner-centred approach becomes popular. The character of non-linear education and up-bringing, its conceptual guidelines (integration, personality, independence, activity, development, and technology) should be modernized taking into account regional features. However, this statement can be contradicted, as traditional (linear) education, based on the strict content, process and time plan is also learner-centred. We connect non-linearity with the high quality and accessibility of information and communication technologies (ICT) in education. Linearity of the educational process is a system or structure of the one-way line in the activity, assigned by single option performance goals or structure. It has no taxonomy of goals and diversity of technologies. Herewith external outer factors have no significant impact on the linear structure of education and its development. The guiding principle of linear education is its dialectic status “from a simple phenomenon, fact to the complex one”. In its time this principle gave high results in educating students (first places in competitions). However, our epoch is characterized by the increase of information in geometric progression, and knowledge of new generations increases. Linear education can not take into account the requirements of FSES of the new generation and global requirements at the same time.

## 5. Research Methods

Non-linear education gives an alternative and possibility of multivariance of education development as a process and system. We consider non-linear education as a specific education based on the search of adequacy and rationality in responses to the factors of the global world and regional challenges. Such understanding means penetrable boundaries between the system of education and the regional environment, which stresses the importance of context technologies and blended learning. A new role of teachers and students should be underlined. New types of activities are added to the traditional ones. They are ICT literacy, initiative, insistence, social and cultural competence in coaching during non-linear education (Bogoslovsky & Glubokova, 2012). From this perspective the main priority in non-linear education is creativity, designing a new product. That is why; such basic skills as computerized skills of the 21<sup>st</sup> century are widespread today – language, numerical, natural-science, ICT-literacy, civilian, cultural. The main features of non-linear education are in priority today: a) mobilizing resources (the Internet, interactive workload, content); b) developing key competencies (4C) of a new generation (criticalness, creativity, context); c) accumulating and recording experience of managing knowledge, communication (bases, on-line platforms, courses, e-libraries, contacts). These features of non-linear education work when the educational process takes into account parameters of interactive learning, mutual understanding, mutual enrichment, interdependence (Egorova et al., 2018). Content knowledge of non-linear education is connected with a greater role of independence in acquiring knowledge, acquirement, understanding (analysis, synthesis, estimating, and reflection), appliance, communication, and projecting new knowledge. It is worth mentioning the designing of the educational environment for the activity (students – technology – teacher). Such a construct of the educational environment disburdens the cognitive load of students: takes off fragmentarity of knowledge; develops extra mechanisms of mental activity and non-linear (creative) thinking; reduces fatigability. The main determinant from the pedagogical perspective is constructing the system of non-linear education taking into account the main trends in the sustainable development of the region as present and future environment, which determined performance goals of educational tasks, used for master students in the discipline “Current issues of science and education” and bachelor students in the course “Pedagogy”. Let’s give examples of some themes which received the greatest interest among master students (Egorova, 2020). To develop the case on technology “Face-to-Face”, prove the possibility of its application within the linear educational environment; disclose necessary components of the digital environment for this technology. Develop a lesson on the technology “Rotation Model” (Rotation in the class, at the lesson similar to the flipped class). A technology “Flex Model” (flexible model), is aimed at independence on the Internet. A lecturer gives tutorials face-to-face if necessary. A technology “Online Lab” - (laboratory practical class) has been tested. It is an electronic source for studying a course. A model of the study menu “Self-Blend Model” has awoken big interest. It allows students to substitute courses with online classes, which provides simultaneous study (Krivykh, 2020). ICT is also important in enhancing independence, diagnostics, results’ monitoring. From this perspective, it is important to note the role of tests and types of control (via the Internet) for quick and objective determining the level of knowledge of every subject of the educational process. All this is in demand. In non-linear education, ICT strengthens not control and diagnostics but the process of studying and acquiring information (Ignatieva, 2011).

## 6. Findings

Within non-linear education, the conception of teaching applying IT has been reconsidered and a system of recommendations on applying developing non-conventional tasks based on the regional content is given. These tasks have been applied in different types of lectures (binary lecture, press conference, with intentional mistakes, visualizing lecture); practical lessons, research work. Developing research tasks on different aspects (humanitarian, scientific, socio-economical) have been recommended and tested by the teachers of the secondary comprehensive schools in the Tyumen region. The content has been chosen taking into account the sustainable development of the region. The first module “Scientific” discloses characteristic features of the region, contains the following study elements (the structure, geography, flora and fauna of the region, neo-sphere, scientific ideas of natural scientists, the concept “ecosystem of the region”, climate, causes of changes, the ozone layer, acid rains, natural and anthropogenic catastrophes). The second module “Humanitarian” stresses legislative and regulating documents and contains the following study elements (globalistics, documents of international organizations, declarations, documents of Russian, regional importance, elements of the scientific trend “green pedagogy”, analysis of the leading principles of the sustainable development of the state and region). The third module “Socio-economical” reflects the following study elements (nature management, environment, and resource economy, rationality of nature management, criteria and parameters of the sustainable social and economical development in the Tyumen region). The content of the tasks has been made taking into account the development of the creative character of interactive learning, mutual understanding, mutual enrichment, and mutual influence. Disclosing the peculiarities of fulfilling the non-linear education process we mention several key parameters, applied in our work. First, creating the educational environment of blended learning, based on the integration of different forms (class-lesson, lecture-discussion), technologies (electronic and distant). Second, loyal relations with the students (freedom and support of the initiative, independent learning) Third, tempo and comfort for all the participants of the educational process. Fourth, creating interactive content, applying open online educational resources.

## 7. Conclusion

The experiment has proved that non-linear education answers the following traditional questions: study how? what? what for? Non-linearity of the educational activity forms new qualities of the professional culture of students and a teacher taking into account the important IT competencies, technologies that make important visual, developing, and information aspects of the educational activity. Practical implementation of the system of non-linear education involves some risks (prevailing of digital communication but not face-to-face one). To avoid risks of formalization and negativity it is necessary to combine linear and non-linear education, which is a necessary and sufficient factor when training a subject for the social life in the region, to the effective interaction in the society, when strengthening parameters of individualization and autonomy.

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