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## TECHNOLOGY FOR DESIGNING AN INDIVIDUAL EDUCATIONAL TRAJECTORY OF UNIVERSITY STUDENTS

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#### **Abstract**

Lifelong education, aimed at personal and professional development, change of occupation, and mastery of broad-profile qualification in accordance with the supply and demand for highly qualified personnel, is crucial. The continuity of education has to ensure the possibility of a person's multidimensional progression of a person in the educational space and create optimal conditions for such progression. The continuous education system is currently one of the priorities in the state development policy in Russia. The essence of choosing an individual educational trajectory lies in the student's decision, which is based on the individual system of values and personal meanings, the general orientation in the spheres of education and labor, highlighting important short- and long-term perspectives as stages and ways of achieving the goal, and the knowledge of one's own

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advantages, disadvantages, and unique personal features. The choice of individual educational trajectory is implemented in a subject field that contains a variety of deepened and enriched educational content, types and forms of subject-related material, rational methods of educational activity, forms of control of educational results and individual work, and levels and ways of obtaining an education.

#### **Keywords**

Professional personnel - Lifelong education - Students - University

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#### Introduction

The basis of "Conception of developing an individual educational trajectory – lifelong education" lies in the specific features of the modern stage (continuity, sustainability, swiftness, and informativeness) and the known trends in global development<sup>1</sup>:

- the increased pace of social development and, as a consequence, the need to prepare people for life in rapidly changing conditions;
- the transition to post-industrial, information society and significant expansion of the scale of cross-cultural interaction, which involves the formation of sociability and tolerance among people;
- the emergence and development of global problems that can only be resolved as a result of cooperation within the international community, which requires the formation of a modern type of thinking in the young generation;
- the democratization of society and the expansion of opportunities for political and social choice, which cause the need to increase the level of people's readiness for this choice;
- the dynamic economic development, increasing competition, reduction of unskilled labor, and deep structural changes in the field of employment, which determine the constant need for professional development and retraining of workers, as well as the growth of their professional mobility;
- the increase in the value of human capital that constitutes 70-80% of national wealth in developed countries, which determines the intensive, advanced development of education for both youth and adults.

Said changes affect the qualification structure of professional personnel requiring professional mobility and excellence and determining the need to constantly update one's knowledge. Therefore, lifelong education aimed at personal and professional development, change of occupation, and mastery of broad-profile qualification in accordance with the supply and demand for highly qualified personnel becomes crucial. This applies to the objectives, content, type, and duration of the educational programs, as well as access to them. This is also related to the coverage of various areas of activity, forms of the educational process organization, as well as methods and techniques used and personnel involved in teaching. One can also mention the ability of educational institutions to quickly respond to the emergence of new needs, to anticipate them, to create structures that are flexible and receptive to changes, and to alter the criteria for access to education in order to take working life experience into account<sup>2</sup>.

In modern pedagogical science, lifelong education is viewed, first, as a system of ideas or beliefs related to the educational practice that positions the person's educational

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<sup>&</sup>lt;sup>1</sup> L. K. Grebenkina, Formirovanie professionalizma pedagoga v sisteme nepreryvnogo pedagogicheskogo obrazovaniia. Ryazan. 2000.

<sup>&</sup>lt;sup>2</sup> S. Ia. Batyshev, Professionalnaia pedagogika (Moscow: Professionalnoe obrazovanie, 1997).

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activity as an integral and natural component of lifestyle at any age. This system of beliefs involves the need to complete the educational ladder with new steps designed for all periods of adulthood. The lifelong enrichment of the individual's creative potential is viewed as the main objective of continuous education. Second, lifelong education is proposed as an integrated process that ensures the progressive development of the individual's creative potential and comprehensive enrichment of their personality. This process is composed of successively elevating levels of specially organized study that provide favorable changes in the person's social status.

#### Literature review

The continuity of education has to ensure the possibility of the person's multidimensional progression in the educational space and create optimal conditions for it. These conditions are meant to assist in confident movement and orientation in the field of professional activity. In this case, integrity understood as deep, non-mechanical integration of every educational subsystem and process serves as a system-forming factor.

By the beginning of this study, substantial progress has been reached in theory and practice of pedagogical education<sup>3</sup>:

- the fundamental principles of pedagogical education have been developed<sup>4</sup> P.F. Kubrushko, V.S. Lednev, A.T. Malenko, A.M. Novikov, G.M. Romantsev, I.P. Smirnov, B.A. Sokolov, E.V. Tkachenko, V.A. Fedorov, V.V. Shapkin, etc.);
- the particular (various) aspects of the theory of professional pedagogical education have been studied, including: historical and methodological (N.I. Kravtsov, V.P. Lednev, V.A. Mosolov, A.I. Pastuhov, H.Sh. Tenchurina, V.A. Fedorov, etc.); sociocultural (N.N. Bulynskii, G.E. Zborovskii, G.N. Neustroev, V.V. Kuznetsov, Iu.A. Lobeiko, Iu.N. Petrov, I.P. Smirnov, A.P. Seiteshev, F.T. Khamatnurov, V.A. Shabunina, etc.); structural and organizational (T.S. Butorina, G.D. Bukharova, V.A. Gusev, E.V. Tkachenko, etc.); substantive and methodical (V.F. Bessarab, Iu.A. Kustov, V.M. Riabov, G.K. Smolin, V.F. Shevchuk, etc.);
- the scientific basis for the integration of pedagogical and technical knowledge has been determined (V.S. Bezrukova, M.N. Berulava, V.V. Kirsanov, B.A. Sokolov, N.K. Chapaev, etc.);
- the problem of the relation between teaching didactics and methods has been developed<sup>5</sup> (L.F. Keiran, V.V. Kraevskii, M.R. Lvov, M.N. Skatkin, B.A. Sokolov, etc.);

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<sup>&</sup>lt;sup>3</sup> T. lu. Lomakina, Diversifikatsiia bazovogo professionalnogo obrazovaniia. Ph.D. Thesis. Moscow. 2001.

<sup>&</sup>lt;sup>4</sup> S. Ia. Batyshev. Professionalnaia pedagogika...; A. P. Beliaeva, Didakticheskie printsipy professionalnoi podgotovki v proftekkhuchilishchakh (Moscow: Vyssh. shk., 1991); E. F. Zeer; A. M. Pavlova y E. E. Symaniuk, Modernizatsiia professionalnogo obrazovaniia: kompetentnostnyi podkhod: Uchebn. Posobie (Moscow: MPSI, 2005) y E. F. Zeer, Psikhologiia professionalnogo obrazovaniia. Ucheb. posob. 2-e izd., pererab (Moscow: Izd-vo Moskovskogo psikhologosotsialnogo instituta; Voronezh: SPA «MODEK», 2003).

<sup>&</sup>lt;sup>5</sup> A. P. Beliaeva, Didakticheskie printsipy professionalnoi podgotovki v proftekkhuchilishchakh...

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- the general theses of the theory of pedagogical engineering (Iu.K. Babanskii, A.S. Belkin, V.P. Bespalko, Iu.V. Gromyko, V.V. Guzeev, M.V. Klarin) and design of pedagogical and educational technologies (G.D. Bukharova, Z.Z. Kirikova, O.A. Orchakov, G.N. Steinov, O.V. Tarasiuk, N.E. Erganova, I.S. Iakimanskaia, etc.) have been developed;
- the psychological issues, patterns, and features of formation and development of a specialist<sup>6</sup> (N.S. Glukhaniuk, G.N. Zhukov, E.A. Klimov, T.V. Kudriavtsev, I.I. Lobach, A.K. Markova, V.D. Shadrikov, etc.), as well as the theoretical basis for personality-oriented education<sup>7</sup>,<sup>8</sup> (N.A. Alekseev, G.N. Serikov, I.S. lakimanskaia, etc.), have been studied;
- the didactic basis of the engineering teachers' professional training has been developed (N.A. Abaimova, S.F. Artiukh, N.M. Zhukova, V.I. Kondrukh, A.M. Kopeikin, P.F. Kubrushko, V.S. Lednev, A.T. Malenko, B.K. Mominbaev, A.Ia. Nain, V.I. Nikiforov, G.M. Romantsev, M.P. Rudnitskii, S.A. Novoselov, B.A. Sokolov, etc.).

A fairly wide practical experience in the field of professional training methods has been accumulated in the secondary professional education system<sup>9</sup> (S.Ia. Baev, Ia.Ia. Butko, M.I. Eretskii, M.A. Zhidelev, Iu.A. Kalikinskii, A.A. Kiva, N.V. Kiselev, N.I Kravtsov, V.A. Markushev, P.G. Matrosov, V.P. Mitronin, V.I. Nersesian, S.S. Rozantsev, L.G. Semushina, V.A. Skakun, N.G. Iaroshenko, etc.). The scientific basis for competency-based state exam development has been formed (A.T. Glazunov, A.A. Kiva, A.N. Leibovich, O.B. Chitaeva, etc.). At present, the concept and model of psychological and pedagogical training is formed in the theory and practice of pedagogical education; its structure and content have been developed<sup>10</sup> (V.S. Bezrukova, N.S. Glukhaniuk, T.I. Gorelova, M.M. Dudina, N.M. Zhukova, N.M. Karpova, L.K. Malshtein, E.A. Mikhailychev, G.M. Romantsev, B.A. Sokolov, etc.).

#### Methods

The continuous education system is currently one of the priorities in the state development policy in Russia. Program documents, including the National Doctrine of Education in the Russian Federation for the period until 2025, National Educational Initiative "Our New School", and Federal Law No. 273-FZ "On Education in the Russian Federation" of December 29, 2012 highlight the need to transfer to a competency-based educational paradigm and increase the priority of working with gifted and motivated children. Successful achievement of these goals is directly related to the individualization of the educational process<sup>11</sup>.

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<sup>&</sup>lt;sup>7</sup> E. F. Zeer; A. M. Pavlova y E. E. Symaniuk, Modernizatsiia professionalnogo...

<sup>&</sup>lt;sup>8</sup> E. F. Zeer, Psikhologiia professionalnogo obrazovaniia...

<sup>&</sup>lt;sup>9</sup> A. S. Batyshev, Prakticheskaia pedagogika dlia nachinaiushchego prepodavatelia (Moscow: Prosveshchenie, 2003) y S. Ia. Batyshev, Professionalnaia pedagogika...

<sup>&</sup>lt;sup>10</sup> E. F. Zeer; A. M. Pavlova y E. E. Symaniuk, Modernizatsiia professionalnogo obrazovaniia... y E. F. Zeer, Psikhologiia professionalnogo obrazovaniia...

<sup>&</sup>lt;sup>11</sup> E. F. Zeer, Psikhologiia professionalnogo obrazovaniia...

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The following models that have positively proven themselves in international experience and in Russia are proposed as promising individualization models: organization of third-level students' learning based on individual educational plans and programs; model of individual educational paths in educational networks; cumulative credit rating system based on module education technology; distance learning based on computer technologies.

#### IET can be viewed as<sup>12</sup>:

- one of the ways to implement individualization in the new paradigm, which refers to the activity of the student as the subject of their own education. At the base of this concept lies the student's own role in cognitive activities, which determines their personal potential;
  - an individual way to actualize each student's personal potential;
- the goal-oriented process of educational program design where the student takes the role of the subject of choice, design, and implementation of the educational path with the teacher's pedagogical support also present;
- an unbroken hypothetical line, along which the person moves in the educational space in accordance with the levels of training (educational qualifications) and taking into account the continuity of previously acquired knowledge.

At the same time, the system of continuous education has to provide three main *conditions*<sup>13</sup>:

- the continuity of educational standards and programs at various levels of general and professional education;
- the ability to temporary terminate and resume study, change its form, choose an individual educational path, advanced training, or retraining, etc., with the goal of maintaining both high level of general education and professional competitiveness, meeting the demands of the labor market;
- the lack of "dead-end" educational programs, institutions, and directions that do not provide an opportunity to continue both general and professional education.

"Conception of developing an individual educational trajectory – lifelong education" should be developed on the basis of the following *principles*<sup>14</sup>:

the principle of basic education – an educational starting point for the successful continuation of the individual's progression in the educational space;

<sup>&</sup>lt;sup>12</sup> V. A. Kan-Kalik, Pedagogicheskaia deyatelnost kak tvorcheskii protsess. Ph.D. Thesis. Moscow: NRU HPS. 1981.

<sup>&</sup>lt;sup>13</sup> A. K. Baklanova, Professionalnoe masterstvo spetsialista kultury: Uchebnoe posobie dlia aspirantov, slushatelei kursov povysheniia kvalifikatsii, prepodavatelei, studentov (Moscow: MSUC, 2001).

<sup>&</sup>lt;sup>14</sup> Iu.V. Vardanyan, Stroenie i razvitie professionalnoi kompetentnosti spetsialista s vysshim obrazovaniem. Ph.D. Thesis. Moscow: MSU. 1999.

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the principle of multilevel education – the presence of multiple educational levels and stages allows a person to fulfill their needs and realize their opportunities, which will lead to a more rational filling of professional niches in the labor market;

the principle of diversification – involves the expansion of the education system activity range and the acquisition of new forms and functions not previously characteristic of it, which allows for an increase in social demand for a higher level of professional education and the necessity of meeting the needs of much more diverse segments of the population; also allows for development of a large variety of alternative educational programs and systems;

the principle of economic competence – as a mandatory component of education, due to the fact that in modern days every person involuntarily joins in economic relations, being either an active (the one that starts their own business and earns through entrepreneurial activity) or a passive participant (just being a consumer of goods and services offered on the market);

the principle of complementarity of basic and postgraduate education – provides the individual with the necessary conditions for improving professional excellence in the educational space;

the principle maneuverability and continuity of educational programs – allows a person to professionally reorient at one or another stage of their life's journey;

the principle of integration of educational structures — corresponds to the restructuring of education systems and allows to create multi-disciplinary, multi-level, and multi-stage educational institutions on the basis of social partnership;

the principle flexibility of organizational forms – reflects the need for ensuring not only a wide variety of forms of education but also their flexibility and variability aimed at creating the necessary conditions for a person's progression in the educational space.

The essence of choosing an IET lies in the student's decision, which is based on the individual system of values and personal meanings, the general orientation in the spheres of education and labor, highlighting the important short- and long-term perspectives as the stages and ways of achieving the goal, as well as the knowledge of one's own advantages, disadvantages, and unique personal features. The choice of an IET is determined by a number of *factors*<sup>15</sup>:

- specific features, interests, and needs of the student and their parents in achieving the required educational result;
  - professionalism of pedagogical staff;
- capability of the professional education institution to fulfill the student's educational needs;

<sup>&</sup>lt;sup>15</sup> N. B. Koshkina, Mnogourovnevaia professionalnaia podgotovka spetsialistov v usloviyakh rynka truda. Ph.D. Thesis. Kemerovo. 2007.

capabilities of the material and technical base of an educational institution.

#### Results

The choice of IET is implemented in a subject field that contains a variety of deepened and enriched educational content, types and forms of subject-related material, rational methods of educational activity, forms of control of educational results and individual work, and levels and ways of obtaining an education<sup>16</sup>.

Personality characteristics lie at the base of choosing and constructing one's IET (Table 1).

Nº	Indicator	Characteristic
1.	Predisposition to a certain type of activity	Predisposition to technical creativity and innovative activity in engineering and technology (creatively innovative personality), to scientific creativity (innovatively creative personality), to public and social activity (publicly innovative personality), students with pronounced leadership abilities (organizationally innovative personality)
2.	Need for professional self-identification	Formation of professional intentions, professional training, and education, professionalization and professional adaptation, mastery, partial or full self-realization in professional activities
3.	Readiness for professional self-identification	Motivation that stimulates and moves the person to the goal and contributes to its development

Table 1
University students' personality characteristics in designing the IET

The development of a person's educational trajectories is affected by internal and external factors. The *external factors* include the following<sup>17</sup>: the accessibility of education, including five types of barriers to equal educational opportunities (institutional, sociocultural, economic, motivational and informational); the creation of an educational environment (institutional, cultural, and economic) that will ensure the educational activity conditions comparable to the ones achieved in the European countries. The *internal factors* include goal-setting in the processes of designing, organizing, and implementing the individual educational activities by the individual themselves (with possible pedagogical support), as well as motivation for the realization of personal potential.

The following factors can be accepted as the criteria for assessing the quality of IET design: subjectivity of its construction, logic of its construction, and breadth of the trajectory<sup>18</sup>.

The mechanism for creating students' IET involves the following steps<sup>19</sup>.

<sup>&</sup>lt;sup>16</sup> A. S. Batyshev, Prakticheskaia pedagogika dlia nachinaiushchego prepodavatelia (Moscow: Prosveshchenie, 2003)

<sup>&</sup>lt;sup>17</sup> A.P. Beliaeva, Didakticheskie printsipy professionalnoi podgotovki v proftekkhuchilishchakh (Moscow: Vyssh. shk., 1991).

<sup>&</sup>lt;sup>18</sup> A. G. Glazko, "Trebovaniia k lichnostnym i professionalnym kachestvam vypusknika", Spetsialist num 7 (2003): 20-22.

<sup>&</sup>lt;sup>19</sup> A. B. Kaganov, Rozhdenie spetsialista: professionalnoe stanovlenie studenta (Minsk: BSU Publ., 1983).

The *goal-setting* stage involves competent goal-setting and diagnostics of the basic personal qualities (values, motivational, normative, positional, organizational, informational, control, and evaluation qualities), necessary for the "launch" of the educational path, of two subjects – the teacher and the student.

The *technology* stage involves the creation of an individual educational program as an implementation of the educational trajectory in accordance with the developed method.

The effectiveness of designing an IET is determined by a number of *pedagogical* conditions (Table 2).

Nº	Pedagogical conditions			
1.	Student's awareness of the necessity and importance of creating an IET as a form of self-identification, self-realization, and verification of the choice of content, form, mode, and			
	level of education.			
2.	Targeted activity of the educational process participants aimed at the formation of a			
	sustainable interest in the process of designing an IET.			
3.	Implementation of psychological and pedagogical support of students and information			
	support of the IET designing process.			
4.	Student's involvement in the creation of an IET (as the subject of choosing the			
	educational path and the client of educational services).			
5.	Organization of reflection as the basis for IET correction.			

#### Table 2

# Pedagogical conditions for designing a university student individual developmental trajectory

An important place in IET development is devoted to *pedagogical support*. The essence of pedagogical support is related not only to preventively teaching the student to plan their life path and IET independently and resolving problem situations but also to the adult's permanent readiness to adequately respond to physical and emotional discomfort of the student and/or the people around them, as well as the student's request for interaction<sup>20</sup>.

The directions of pedagogical support<sup>21</sup> of IET development and implementation are presented in Table 3.

Nº	Direction	Characteristic
1.	Analysis and design	Includes the analysis of students' individual characteristics, educational needs, and the dynamics of development.
2.	Counseling	Individual and micro group consultations of students are held.
3.	Coordination	Work of teachers of educational institutions and the institutions of continuing education, psychologist and social workers is coordinated. Support is provided in building constructive positive relationships between all subjects of

<sup>&</sup>lt;sup>20</sup> V. P. Kosyrev, Praktikum po metodike professionalnogo obucheniya. Study guide (approved by the Ministry of Agriculture of the Russian Federation as an account textbook for agricultural universities students in the specialty 030500 - "Professional training") (Moscow: FSEI HPE MSAU, 2005).

<sup>&</sup>lt;sup>21</sup> Z. S. Levchuk. Formirovanie gotovnosti k professionalnomu tvorchestvu u studentov pedvuza. Ph.D. Thesis. Minsk: BSU. 1992.

I		students is also carried out.
5.	Organization	Is responsible for the organization of the educational
5.	Organization	Is responsible for the organization process.

Table 3

Directions of pedagogical support of university student IET design

The implementation of IET involves the use of various *types* of support: information support, modular-matrix support, and administrative-technological support.

The use of other educational organizations' resources is an effective way to expand the range of educational services and possibilities of pedagogical support of students' IET. One of the ways to achieve this goal is to organize a network interaction system.

In the last decade, various models of educational networks have started to emerge in different regions of Russia: "the simple comradeship" (Krasnoyarsk region), "the community of nominative schools" (Penza region), "trajectory network organization of education in rural areas" (Altai region), "the regional module education organization", various educational associations, "the network university", regional and interregional innovative networks, etc.<sup>22</sup>.

#### Conclusion

The main advantages of building an IET in the context of continuing education are:

- for the person the ability to make an individual choice of content, level, and ways of obtaining and successfully completing education at each level that meets the intellectual, social, and economic needs of the individual;
- for the society the opportunity to get a specialist with required qualification parameters in various training periods, which protects the rights of consumers paying the cost of training needed workers;
- for the teacher the possibility of the most complete implementation of scientific and pedagogical potential, as the proposed system provides greater independence in determining the educational content and teaching technologies and protects the teacher's right to work with students prepared for the given level of training and interested in receiving the selected educational services.

Thus, with the use of IET, the education system becomes flexible, variable, responsive to the changing needs of society, and able to meet each individual's educational needs.

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<sup>&</sup>lt;sup>22</sup> E. F. Zeer; A. M. Pavlova y E. E. Symaniuk, Modernizatsiia professionalnogo obrazovaniia...

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