

Formation of future specialists' individual educational route in the conditions of credit system (on the example of the Republic of Kazakhstan)

La formación privada de futuros especialistas de educación bajo condiciones del sistema de crédito (Ejemplo: República de Kazajstán)

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ABSTRACT:

The article provides a specified definition of the concept of "student's individual educational route"; describes the peculiarities of training specialists in the context of credit system implemented in Kazakhstan universities, as well as the shortcomings of the credit system of training; presents the developed model of formation of the individual educational route of future specialists in the conditions of credit system and the technology of forming the individual educational route of future specialists; describes and tests the pedagogical conditions that contribute to the successful formation of the individual educational route. The article details the results of the study, and also evaluates the effectiveness of the individual educational route of the student according to the criteria selected by the authors.

RESUMEN:

El artículo proporciona una definición específica del concepto de "estudiante educativas individuales de ruta"; describe las peculiaridades de la formación de especialistas en el contexto de crédito del sistema implementado en Kazajstán universidades, así como las deficiencias del sistema de crédito de la formación; se presenta el modelo desarrollado de formación de la educación individual de la ruta de los futuros especialistas en las condiciones de crédito del sistema y la tecnología de formación de la educación individual de la ruta de los futuros especialistas; describe y pruebas de las condiciones pedagógicas que contribuyan al éxito de la formación de la persona vía educativa. En el artículo se detalla los resultados del estudio, y también se evalúa la eficacia de la educación individual de la ruta de la estudiante de acuerdo a los criterios seleccionados por los autores.

Keywords: Individual educational route of students in the conditions of credit training system, the model and technology of formation of the individual educational route of future specialists

Palabras clave: educación individual de la ruta de los estudiantes en las condiciones de crédito del sistema de formación, la tecnología y modelo de formación de la educación individual de la ruta de los futuros especialistas.

1. Introduction

In 2010, Kazakhstan joined the Bologna Declaration, becoming one of the few Central Asian states an equal member of the European educational space. The main goal of Kazakhstan's participation in the Bologna Process is to expand access to European education, further improve its quality, and to promote student and teacher mobility through the adoption of a comparable system of higher education levels, the use of credit system, the issuance of a European-type of transcript to the university graduates. In accordance with the commitments undertaken in line with the Bologna Declaration, Kazakhstan should implement a number of measures to ensure recognition of educational programs. This priority is outlined in the Concept of Education Development in the Republic of Kazakhstan until 2015, as well as in the State Program for the Development of Education until 2020 and in a number of other documents.

At the same time, as the results of our study show, the promise of higher education for further life and career is significant only for 30% of university first-year students; more than 21% of the students interviewed associate the chosen specialty with their interests and abilities, and for 16% of first-year students, the motivation for entering the university was to receive higher education as such. Consequently, the request for higher education in modern conditions is diverse; it traces the orientation of both professional and personal self-determination and self-actualization. There is a tendency to receive not so much a certain profession, as higher education as the basis for further development, formation of the professional career and life path.

Analysis of scientific and educational literature (B.A. Abdykarimov, G.K. Akhmetova, N.A. Assanov, O.V. Boyev, G.N. Gamarnik, G.G. Piven, A.A. Kussainov, S.R. Ibatulin, B.A. Myrzamiyev, S.M. Omirbaev, O.A. Sevostyanova, A.I. Chuchalina, et. al.) and the experience of Kazakhstani universities allowed to reveal the contradictions between: orientation of modern university graduates to personal, as well as professional self-determination and the limited opportunities of higher education in creating the conditions for the development of the individual's potential; introduction of credit training system (CSR), maximally focused on the individualization of educational process and traditional methods of teaching at the university that are frontal, and do not take into account the needs of the individual; the urgent need for universities, introducing CSR in technology to build individual educational route (IER) and the actual lack of theoretically substantiated methodological support for this process.

Solving these contradictions determined the problem of our research: the development of individual educational route for students in the conditions of credit training system, as opportunities for professional and personal self-realization and self-actualization.

In accordance with the goal of the study, the following tasks are made:

1. To clarify the essence of the concept: "student's individual educational route".
2. To reveal the peculiarities of training specialists in the conditions of credit training system, implemented in Kazakhstani universities.
3. To design and implement the model for building future specialists' individual educational route in the context of credit training system.
4. To develop, test and implement the technology of forming future specialists' individual educational route.

2. Literature review

If we consider the etymology of the French word *marche*, then it means the move, the forward movement and *route* - the road, the way. In general, the term "route" means the

direction of the object's movement, relative to certain landmarks and coordinates, indicating the main points [1].

Beginning in the 1990s, the practice of individualized university education offered various approaches for its implementation, this radically influenced the formation, content and design of the term "individual educational route".

Simultaneously, for the first time the idea of building individual educational routes has been developed in the studies of problems of secondary education by the St. Petersburg scientific school (T.A. Alekseeva, S.V. Vorobyova, E.S. Piskunova, A.P. Tryapitsyna) who understand it as a purposefully designed differentiated educational program that puts the student to the position of the subject of choice, the subject of development, the subject of realization while teachers implement pedagogical support for his self-determination and self-realization [2].

The analysis of dissertational studies (M.B. Utepov, L.A. Osadchaya, M.V. Trofimov, et. al) showed that such pedagogical category as "individual educational route" was most studied in relation to the system of general secondary education and to a lesser extent to the system of higher education, not covering the process of training specialists in the context of implementation of the credit system of training, which once again emphasizes the significance and relevance of our research work in this direction. Thus, the study by M.B. Utepov focuses attention on the promotion of students' personal qualities in the process of implementing IER; L.A. Osadchaya, S.N. Yamshinina view IER as a means of overcoming the difficulties of schoolchildren; M.A. Kunash considers IER as a means to ensure the readiness of a teenager's professional choice; M.V. Dovydova reveals IER as the main factor in increasing the efficiency in the training of the technology teacher; M.V. Trofimov studies the organizational aspect of IER in student training; N.G. Zvereva researches the student's IER on the basis of complex pedagogical diagnostics; Lorentz V.V. when designing a student's IER, assigns the leading role to pedagogical disciplines.

The practice of implementing individualized approach in higher education in Russia and Kazakhstan in the first decade of the twenty-first century (V.I. Bogoslovsky, N.A. Zavalko, N.G. Zvereva, V.V. Lorentz, M.L. Sokolova et. al.) suggested different ways that dramatically influenced the formation and design of the term "student's individual educational route".

The analysis of literature on the above problem allowed us to state that in the definition of the concept of "individual educational route", two directions were outlined: the first is directly related to the content and learning of a particular discipline, and the second, to general learning and development in the educational program. We adhere to the second direction, which, in our opinion, more accurately determines the professional route of the future specialist. At the present time, in the scientific literature along with the concept of "individual educational route", the term "individual educational trajectory" is used (G.A. Bordovskii, S.A. Vdovina, E.A. Klimov, B.C. Merlin, N.N. Surtayeva, I.S. Yakimanskaya, et.al.), which has a broader meaning and involves several areas of implementation: related to content (variational curricula and educational programs that define individual educational route); to activity (special pedagogical technologies); procedural (organizational aspect).

We consider it expedient to explain the distinctive features of the concepts of "individual educational route" and "individual educational trajectory". Individual educational trajectory, in our opinion, is a certain vector of the student's development, which is realized (acquires specificity) in the educational route with quite specific, control points. Consequently, individual educational route specifies, creating a coherent basis, and serves as a means of implementing an individual educational trajectory. Solving the first task of our research, we define the student's "individual educational route" as a phased activity plan (educational, scientific, value-orientated, etc.), projected on the basis of subject's own experience and personal perspectives, together with the adviser (consultant). It is implemented by taking into account the electivity (both of teachers and academic disciplines), academic mobility, developed on the basis of person's individual, professional inquiries, contributing to the development of the subjective position of personality, its self-actualization and self-realization.

3. Methodology

In connection with the fact, that the object of our study is individualization of teaching at the university that implements the credit system of education, and the subject matter is the content and structure of individual educational route of future specialists, students of faculties of Psychology, Pedagogy, Philology and Economics of S. Amanzholov East-Kazakhstan State University (1 to 4 years), advisers of student groups, teachers of various disciplines took part in the research, on total 445 people. The study was conducted 2011-2017. The specificity of the problem under investigation consists in its weak development both in the content, process and experimental aspects, so we saw the solution to this problem in a comprehensive study of the IER phenomenon.

To solve the set goals and tasks of experimental work, we determined its algorithm, procedure and basic methods (questioning, conversation, observation, self-assessment, expert evaluation, diagnostics, methods of mathematical statistics), corresponding to the logic of research and the principles of research work. The following principles of experimental work were defined: creativity (i.e., not doing any psycho-emotional harm to the subject); reproducibility (obtaining similar results when performing multiple tests); lack of controversy with ethical norms and rules; the necessity and sufficiency of the information received; objectivity of the information received; controllability of the experiment.

4. Results and Discussion

The relevance of forming student's IER determines the need to identify the basic conditions for its achievement. The most important of these is defining the component composition of the phenomenon under study. Considering the multidimensionality and insufficient knowledge of the phenomenon in the context of the investigated problem, we found it expedient to present the component composition of IER. Proceeding from different aspects of IER consideration, we distinguish: the target, content, organizational, technological and evaluation-productive components. It should be clarified that in our research we focus on the process of forming individual educational route for future specialists, since the formation of IER is considered in this context as a process in which, as a result of organized and joint purposeful activity of teachers, advisers and students, IER acquires a concrete form (outline), as well as stability and completeness (structural and content).

Comparative analysis of the traditional (linear) and credit system of education implemented in Kazakhstani universities was carried out, which showed their significant differences in a number of ways: the duration of the academic year, vacations, semesters, sessions, forms and methods of monitoring and evaluating the quality of education, the students' movement between universities, training trajectory, elective courses and disciplines, mobility, etc. The comparison allows us to say that the credit system gives the student more freedom (in choosing subjects, teachers, educational program, mobility); unlimited access to educational information (curriculum, syllabus, educational literature, timetable, etc.); different forms and methods of interaction with the tutor (interactive, via ICT), which changes the positions of participants in the educational process - they are active subjects. The student must take responsibility for his/her learning, constantly finding new incentives for activities, showing interest in learning, in its results. The teacher-tutor is the same subject as the student, he/she creates conditions for the implementation of teaching and educational activities, an equal partner in the educational process, seeking and studying in cooperation with the student. The main variable that defines the set of educational opportunities is the variability of the content, which determines the depth of the educational trajectory, the choice of disciplines and courses, the nature of interaction with the tutor and the ways of assimilating the learning material. However, in order for the variability and selectivity of the educational content in CSR to become important conditions for a student to realize his/her individual characteristics, a means of personal development, formation of individual ways of thinking, embody his/her self, and find his/her own ways of solving problems, it is necessary to select optimal dynamics of learning, with choosing the motion vector, taking into account objective measurements of students' abilities, their activity, development of subjective qualities, behavioral and professional lines etc. Thus, there is a need to develop personal programs (individual educational routes) for the realization of personal and professional potential of future specialists defining the start and end points of the route, as well as the prospects of

building individual development of each student.

Based on the analysis of the literature, we have identified some shortcomings of the credit educational system, which consist in:

- low level of methodical, information support of the learning process;
- excessive focusing of the educational program on the needs of the labor market, to the detriment of fundamental disciplines;
- excessive absolutization of testing as a method of controlling students' knowledge and skills;
- low level of students' consciousness, which manifests itself in the unwillingness to participate in the discussion of the material of lecture classes, to select the teachers and courses;
- formalization of training, manifested in its separation from practice;
- appearing of the so-called office hours (SRSP), which attendance is not compulsory for students;
- lack of time to study the course program (the class lasts 50 minutes instead of the usual 1.5 hours);
- transition from the format of "teaching" to the format of "learning", which yesterday's schoolchildren are not ready for.

The lack of consistency, systemic, linearity, and excessive variation of content in the conditions of credit training actualizes the problem of the development of individual educational routes, which allows to track the results of each student's activity, minimize the state of estrangement, non-participation and frustration when they find themselves in difficult situations caused by the choice, etc.

Solving the second task of the study, we highlight the following features of training specialists in the conditions of the credit system of education at Kazakhstani universities: restructuring the university teacher's style to the characteristics of CSR; creating special information and educational environment at the university; transferring the emphasis from a knowledge-oriented to competence-oriented educational paradigm; achieving maximum individualization in the training of future specialists; participation of employers in implementation of the educational program.

Based on the definition of the pedagogical model, taking into account the signs of its functioning, we have developed a model for the formation of individual educational route for the future specialist in the context of credit training system, the schematic representation of which is the unity and the variety of interrelations between its elements: the relevant goal, approaches (polysubject, competence, synergetic, activity, contextual), principles (variability, individualization, reflexion, participativity), specifics of training specialists in the conditions of CSR; IER components, IER formation technologies, subjects of interaction and results. A special place in the model is given to the components of the individual educational route. We identify the target, content, organizational-technological and evaluation-productive components. A key place in the model is the technology of IER formation. The technology of IER formation is a system process for designing a "route" for a learner, taking into account their individual needs and requests in the context of CSR implementation. The technology of forming the IER includes the following main stages: 1. Formation of training objectives in accordance with the State Educational Standards and the individual goals of each individual student. 2. Selection of teaching technologies within the educational route and the development of a mechanism for managing the educational, cognitive, scientific and other activities of students. 3. Development of the appropriate content. 4. Development of the "routing" map, as well as the route algorithm. 5. IER advisor's support. 6. Diagnostics of the effectiveness of training within the IER and making necessary adjustments. 7. Reflection.

In our opinion, pedagogical conditions conducive to the successful formation of the individual educational route for future specialists are the following:

- the teacher's readiness for interaction in the conditions of student's realization of the individual educational route, including the target, content, organizational-technological, and evaluation-productive components, implemented in the process of targeted training of future specialists in CSR;
- diagnostic-analytical, reflexive activity of the participants in the educational process, serving as a tool for student's, adviser's, teachers' self-analysis;
- using various interactive learning technologies, allowing to form an integral structure of professional activity of future specialists, with the purpose of creating a real context of professional activity;
- special training and retraining of the advisers for the higher education system, with the course on designing an individual educational route included in the program;
- subjective position of all participants in the educational process;
- psychological-pedagogical and information support for the formation of IER;
- active students' participation in the process of forming IER.

In order to outline the adequate ways of forming the student's IER, it is necessary to diagnose the level of development of personal and professional qualities, which allows selecting effective methods of forming IER. Diagnostics of the level of development of professional and personal qualities was carried out at various stages of experimental work. The evaluation of the IER implementation efficiency should be carried out on a wide range of parameters, among which the following can be distinguished as the main ones:

- structure and content clearness; the route outline;
- strategies for the route promotion (horizontal, vertical, mixed);
- the intensity of the route;
- effectiveness (motivational criterion: stable cognitive motives, extracurricular and educational cognitive interests, conscious professional interests, correlated with the cognitive ones, the value of cognition);
- intellectual-cognitive criterion (indicators: independent stating goals and tasks, making hypothesis about the connections and patterns of one's own actions in the design of an individual educational route, making conclusions based on argumentation; possessing logical thinking operations, using various methods of cognition, transferring thinking techniques from stage to stage of the route; creating algorithms, orienting bases of the route);
- information-communicative criterion (indicators: awareness of own opportunities and opportunities of educational space, construction of speech expression, work with information);
- tracking the prospects for the route development;
- emotional-volitional and regulative criteria (indicators: satisfaction with the conditions of training, satisfaction with relations, adequate positive self-esteem and level of claims, emotions to learning, cognitive reflection of actions to solve the problems of designing an individual educational route, the level of general anxiety, responsibility for one's own choice of actions in the individual educational route, monitoring and evaluation of the process and results of the project route implementation);
- the criterion of subjectivity of the trainee in the educational process (indicators: initiative in determining the goals and ways of achieving them, desire for self-knowledge, the value and importance of one's own personality, the experience of independent design, research, experience of business leadership).

Experimental work on implementation of the developed model for formation of students' IER under the CSR conditions was carried out in three stages: ascertaining, formulating, controlling. In accordance with the findings of the ascertaining experiment, and the tasks assigned in the study, all experimental work aimed at testing the effectiveness of the developed model for formation of IER, the technology of IER formation, as well as the implementation of the developed technology for IER design.

A set of diagnostic techniques allowed us to ascertain the real level of personal and professional qualities of students. It was found out that 61% of the students in the experimental group and 63% of the control group were at a low level of development of personality traits and 54% of the students in the experimental group and 53% of the control group had a low level of development of professional qualities. Consequently, the levels of personal and professional achievements were approximately the same. To ensure that our theoretical conclusions and ideas about the phenomenon under study take a specific form, it is necessary to objectively measure the phenomenon; in our study, we use the criteria and indicators of the effectiveness of IER implementation. During the ascertaining stage of the experiment, students showed interest in studying the technologies of choice, interest in professionally relevant information, interest in the results of their activities, and showed interest in professionally significant information.

The technology of forming IER is a purposeful, managed interaction between a teacher and a student, aimed at creating and implementing in the educational process individual routes of academic activity that allow tracking personal and professional achievements of students in the process of mastering their educational program. The technology involves interaction between different subjects of the university educational process, changing the role of the teacher, new functions of the adviser, office registrar, and their role in the process of professional becoming a future specialist. It should be emphasized that this technology provides activity of both the adviser and the student in the process of IER development and implementation);

At the initial stage of IER formation, *the training goal was set on the basis of student's individual needs*. At this stage, various forms of interaction between the adviser and the students provided a certain motivation for the IER design, since the students were initially given a reference point. At this stage, by results of interviews with students, as well as self-diagnostics, the adviser carried out individual work to stimulate interest in the development of educational program, the selection of courses, disciplines, teachers, which is reflected in the individual educational route.

The activity of the adviser at this stage was to create conditions for the student to analyze the educational situation, realize his own capabilities, to organize diagnostic studies of the personal potential of the future specialist, and his orientation. In turn, the student's activity consisted in the fact that he/she, based on an objective analysis of the educational situation, assessed his professional and personal potential, determined the "circle" of his professional interests, and carried out self-diagnostics. The statement of the goal and the description of the stages of its achievement was carried out by answering the questions: What do I know? What can I do? What am I capable of? At this stage, educational results were planned.

The most diverse forms and methods of interaction were used at this stage: the situation of critical self-evaluation, mutual evaluation and agreement on obtaining a primary diagnosis of results with the obligatory organization of reflection. Self-presentation situations were created: the student was given directions for self-analysis on the correlation of his views, knowledge, interests, values with those offered during the course. The orientation toward the student as the subject of learning in the IER design was conducted. Psychological and pedagogical diagnostics of the initial state of personal potential, professional intentions, subjective characteristics were used.

The next most important component of IER formation technology is the technological support of IER (selection of training technologies). The activity of the adviser was based on the requirements for CSR, using the potential of the information and educational environment of the university, the available innovative technologies, the adviser created the conditions for building the IER concept by creating a choice situation. The activity of the students consisted in the fact that, based on the diagnostic data, self-diagnostics, they defined the IER concept, while choosing for themselves the most significant areas of future professional activity, using the proposed capabilities of the information environment. The forms and methods of implementation at this stage were the most diverse: presentations, trainings, individual and group interviews, business and roleplays.

The next component of the technology is directly related to *the development of the route*

map. The activity of the adviser at this stage was directly related to assisting the student in the development of the route with specific points of development through the specification of tasks for each student, creating conditions for the development of a route, general coordination of activities between teachers (supervisor, etc.), a student and other units of the university. In its turn, the student's activity consisted at this stage in designing an individual educational route with concrete results, indicating the most significant conditions of activity (level, timing, nature of activity), active interaction not only with the adviser, but also with other subjects of educational process. The result of the activity at this stage was the developed IER with exact results.

The technology component "*Adviser's support for IER*" provided for psychological-pedagogical support of IER and consisted in the use of alternative strategies for interaction between the adviser and the student in accordance with the theory of choice: trust, support, hope, hearing, acceptance, respect, negotiations. For this purpose, the following skills of the adviser were used: to study the pedagogical situation and make expedient decisions; possess of various interaction strategies; solve various problems in a complex; correlate the content of teaching with the goal of IER; implement an integrative approach to the development of IER; stimulate the student's self-educational activity; apply an individual and differentiated approach to the student.

The technology component "*Learning content within the IER framework*" provided for assistance in choosing the forms, methods and means of training in accordance with the type of personality on the basis of which methodological recommendations were made. Selection of content was carried out in accordance with the abilities and needs of each student. Differentiation of content was carried out both in terms of the level of training and the chosen trajectory of instruction, in accordance with which the content of the educational portal took place.

The component "*Diagnostics of training effectiveness and timely correction*" was supposed to evaluate the implementation of the route based on the specified indicators, the development of a corrective program. Based on the level of their claims, available indicators, self-assessment of the results of their own activities was made, the route was adjusted for the next year, and the causes determining the result were revealed.

Since the most important component of our model is the institution of advisorship, the training of advisers was realized in the developed course: "Designing an individual educational route in the CSR environment".

The goal of the course is the formation of special knowledge and skills, as well as the development of professional competencies for advisers and tutors working in the credit system of education.

In addition to the theoretical training, during the implementation of the special course, the teachers offer practical classes that consist of performing certain creative tasks, for example, designing an individual educational route taking into account the specific characteristics of the student, as well as assignments of a problem nature related to solving specific problem situations against the background of the academic problems of students; playing specific situations and roles, writing essays.

Business and role-playing games were organized: "Credit system of training", "Field of problems", "Linear and credit systems of training", etc.

In the process of practical training, the following technologies were implemented: trainings, chats, on-line consultations, forums; the content of the EKSU information educational portal (section Center for Qualification Confirmation) was developed, which created conditions for advisers and tutors in their professional self-actualization.

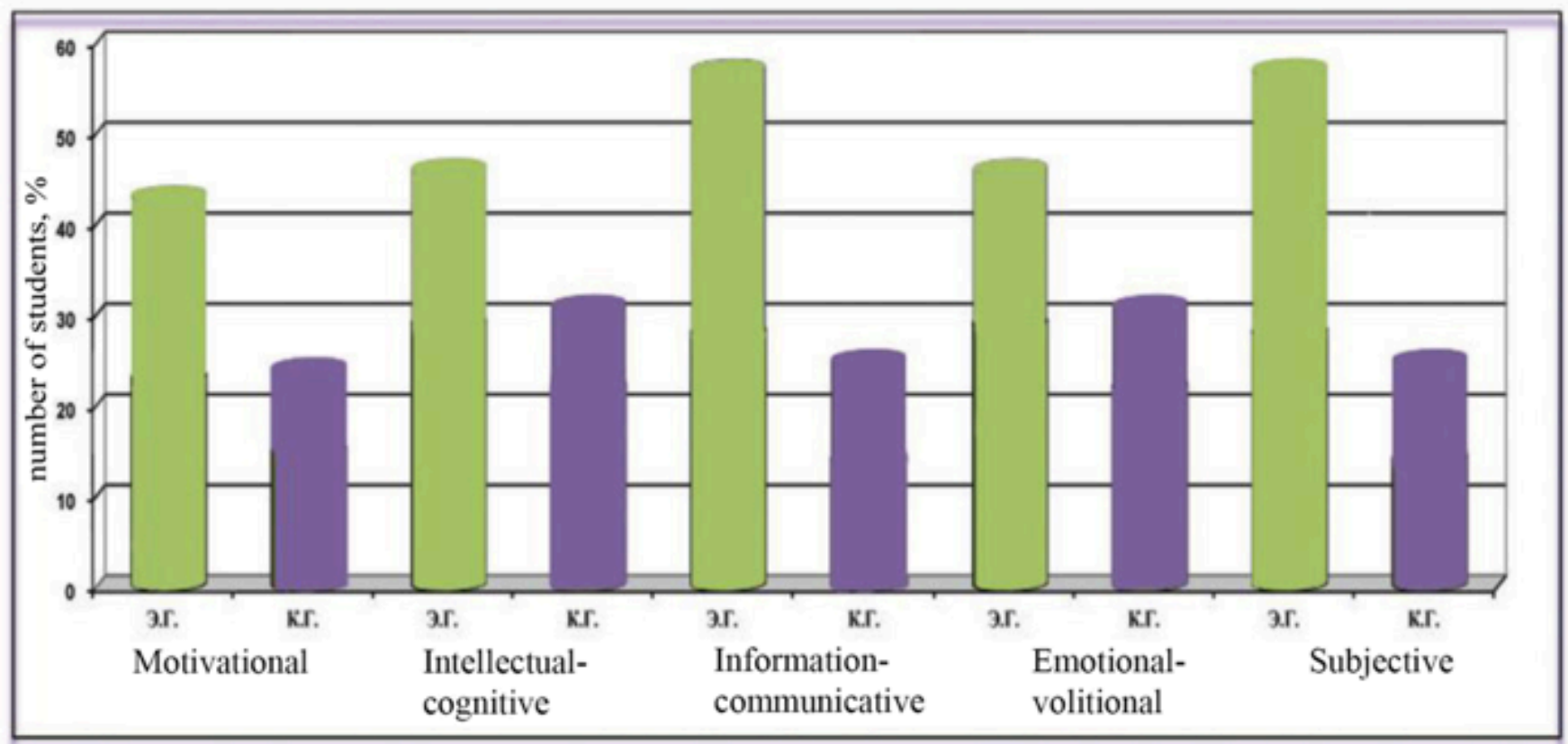
To assess the differences in the values of the mean values of the control and experimental groups, which are distributed according to the normal law, the Student's criterion was applied. The empirical value of the Student's coefficient is $t_{emp} = 8$. The critical value of the Student coefficient with a confidence level of 0.95 $t_{cr} = 2.07$. t_{emp} is significantly more than t_{cr} .

The generalized results of the experiment on all five criteria for the effectiveness of the

implementation of student IER are presented in Figure 1.

Figure 1

Results of the experiment on the effectiveness of the IER implementation in five criteria



The figure clearly illustrates the more significant difference between the experimental and control groups of the IER implementation efficiency in the following criteria: motivational, intellectual-cognitive, emotional-volitional, and subjective criteria. To confirm the reliability of the differences in the results in the control and experimental groups, we used K. Pearson's chi-square criterion. The calculated values of χ^2 for all components of the effectiveness of student IER formation under CSR conditions are significantly greater than the critical value χ^2 (equal to 5.99) with a probability of 95%. The effectiveness of experimental training in the framework of the developed model is confirmed by the following indicators: stable cognitive motives, extracurricular and educational cognitive interests, conscious professional interests, independent setting of goals and objectives; independent formulation of conclusions on the basis of argumentation; possession of logical operations of thinking; satisfaction with relations, adequate positive self-esteem and level of pretensions, emotions experienced in relation to learning, cognitive reflection of actions to solve the problems of designing an individual educational route, initiation in determining the goals and ways of achieving them, striving for self-knowledge, value and significance self, etc. The effectiveness of implementation of the constructed model is confirmed by getting of statically significant differences in the dynamics of the effectiveness of the student IER formation in control and experimental groups for all five components.

5. Conclusions

The central part of our experimental work is the developed technology to form IER: setting the goal of learning based on individual students' needs; technological support of IER; direct development of the route map; adviser's support of IER; the content of the IER training; diagnostics of training effectiveness and timely correction.

The carried out experimental research has shown the feasibility of training within the framework of the model and technology of IER formation of a future specialist in the CSR environment.

Efficiency of experimental training within the framework of the developed model and technology of IER formation is confirmed by the following indicators: increased motivation for learning; focus on career and career growth; interest in mastering professional knowledge; the development of students' subjective qualities, as well as the growing professionalism of the advisers in assisting the students in the design of the IER.

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