LOOK ACADEMIC PUBLISHERS
OPEN ACCESS

INTERNATIONAL JOURNAL OF ENVIRONMENTAL & SCIENCE EDUCATION
2016, VOL. 11, NO. 9, 2299-2310
DOI: 10.12973/ijese.2016.606a

Designing and Realization of an Individual Educational Program

Gulnaz R. Yunusova[a] and Ekaterina V. Karunas[b]

[a]Kazan (Volga region) Federal University, Kazan, RUSSIA; [b]Bashkir State Pedagogical University named after M. Akmulla, Ufa, RUSSIA

ABSTRACT

Relevance of the issue is caused by the change of a knowledge-oriented educational paradigm into an individual-oriented one. This change means that an individual is the most significant value in the modern process of teaching. The aim of the article is to find a theoretical proof for an individual study program design and test it in pedagogical conditions. The leading approach in this research is individual-oriented which provides the following pupil's rights: to choose a study course, to be involved in the process of personal educational program arrangement; to choose an individual pace, form and methods of studying, control and self-estimation methods, etc. The article contains the author's point of view on the essence and content of an individual educational program and a new way of its design and implementation. The materials given are practically useful for all participants of a teaching process who follow an individual educational program.

KEYWORDS
Individual-oriented approach, individual educational program, pedagogical design, algorithm of individual education program

ARTICLE HISTORY
Received 21 August 2015
Revised 10 March 2016
Accepted 22 March 2016

Introduction

Nowadays in the modern Russian system of education an individual-oriented educational approach is more and more widely implemented. The popularity of this approach is caused by the development of a Russian society with a humane and democratic attitude towards children and adults forming their personal features. It is especially important when a child develops his or her own personality in a volatile type of a society. An individual-oriented approach in a studying process should be

CORRESPONDENCE Ekaterina V. Karunas ✉ katerina.karunas@yandex.ru

based on the following statements: individual features of a child are of high priority, a child is a unique carrier of a subjective experience; education means unity of teaching and learning; a teaching process should provide opportunities for individual activity concerning acquisition of socially significant standards of studies; a pupil's abilities develop through a constant process of knowledge enrichment; studies provide knowledge (Yakimanskaya, 1996). Thus, education based on an individual-oriented approach has to consider a child's personality, his or her self-value and a subjective attitude to a teaching process to be the most valuable components in the process of studying (Andreev, 1996).

To implement an individual-oriented approach in education we have to bear in mind the main principles of education (principle of individual approach, integrity, type unity, etc.), classic didactic principles (principle of scientific relevance, accessibility and visualization and others), as well as specific principles: to allow a pupil choose an individual aim in education; to follow the universal bases of a productive studying process, characterized by context and educational reflection (Khutorskoy, 2005). A personal development is impossible without an emotional experience, a personal attitude to the world, independence, a will to a self-growth and self-realization. An individual-oriented approach is the base for an individual-oriented cultural pedagogy (Lezhneva, 2000). To find an appropriate solution in this sphere the modern system of education must be directed at an individual and an increasing role of a human factor in the development of a society. The main condition providing a solution is a proved effectiveness of individual educational programs and a teacher's willingness to implement them.

Literature Review

Different Russian and foreign scientists studied many aspects of an individual type of education. I.E. Unt (1990) in his studies paid much attention to individualization of studies; A.A. Kirsanov (1982) also formulated pedagogical bases for a studying process. An individual-oriented educational program implementation is considered by such scientists as N.V. Lezhneva (2000), V.V. Serikov (1994), I.S. Yakimanskaya (1996), Yu.K. Babanskiy (1989) also studied an individual education as a means of an individual pedagogic approach realization aimed at pupils' cognitive activity development which is reflected in pupil's individual and home works. Recent researches are dedicated to a structure, essential parts and principles of individual educational route and paths realization. (Tryapitzyna, 2000; Vorobyova, 1999; Labunskaya, 2002).

Aim of the Study

The aim of the article is to find a theoretical proof for an individual study program design and test it in pedagogical conditions.

Research questions

The overarching research question of this study was as follows:

What are the conditions for the design and implementation of individual training program will be most effective?

Methods

The methods of the present research include theoretical methods (analysis, synthesis, comparison, concretization, generalization, modeling); empiric methods

(educational process examination in establishments of general education, analysis of their regulatory documents, software equipment and teaching materials); experimental methods (stating, formation, control experiments); poll methods (questionnaire, test, expert evaluation method); methods of mathematical statistics and a graphic representation of results.

Results

The research was carried out in three stages.

At the first stage called a 'stating stage' (connected with finding the necessary information) we analyzed classic and other necessary scientific works concerning the issue, considered existing conceptual approaches to this problem and generalized pedagogical experience of Russian and foreign scientists; formulated special categories and defined the field of the problem; selected and adapted diagnostic methods of pupils' mathematical material acquisition; worked out a reasonable pedagogical step-by-step algorithm for an individual educational program design and implementation; drew up a plan of the experiment. During the stating stage we defined the control and the experimental groups; distinguished and reasoned special organizational and pedagogical theoretical conditions encouraging effective implementation of an individual educational program in algebra and geometry studies.

During the second (forming) stage new didactic materials were created. They included an individual type of one's education, differentiated kinds of tasks for an individual work, achievement tests, individual cards of knowledge, mathematical dictation, and topics for micro researches. The forming experiment was also carried out in the experimental group of pupils; this stage allowed to check and correct organizational and pedagogical conditions and their effectiveness.

During the third stage (final, control stage) we analyzed the results obtained and defined the final state of an object; evaluated effective implementation of organizational and pedagogic conditions and an individual educational program; formulated theoretical conclusions and methodological recommendations for an individual educational program implementation.

The essence and content of an individual educational program and its step-by-step realization algorithm.

In the modern education there are new definitions connected with an individual-oriented paradigm, such as 'an individual educational route', 'individual educational path', 'individual educational program'. Explanatory dictionaries and encyclopedias define an 'educational route' as a prescheduled way to the destination with the main stops indicated; a 'path' as an object's movement line; a 'program' as an activity plan or a summary of a studying object. In education these terms are defined as follows: an individual educational route can be one of the possible generalized educational route projections and a variant of a development route (type of a route) in education. There are adaptive, developing and creating individual types of educational routes (Labunskaya, 2002). An individual educational path is a pupil's personal way of his or her potential abilities realization (Khutorskoy, 2005); for their realization a studying process should be based on an individual educational program.

We consider that an individual educational program (IEP) is an adapted personal integral pedagogical system encouraging pupils to develop their abilities. The structure of IEP consists of the following components: a purpose-oriented,

cognitive component (it reflects the content of a particular educational program); technological component (it includes current pedagogical technologies, methods and methodology, educational and upbringing systems); diagnostic component (it reveals a system of diagnostic tools); result-oriented component (it describes desirable results of an individual-oriented education program implementation). An individual educational program has the following functions: regulative function (it is compulsory to follow it strictly); goal-setting function (defines aims and values); content-selective function (defines elements in the content of the education); procedural function (it defines a logically sequent acquisition of the education content , methods, form, means and conditions); evaluation function (defines a level of the education content acquisition and criteria for an individual educational program acquisition).

An individual educational program is basically a pupil's development project. Thus, such a program should be carried out according to design methodology rules. Pedagogical design is considered as an activity for carrying out and realization of such educational projects as prototypes and pre-image of an object (Bezrukova, 1999; Vorobyova, 1999; Zair-Bek, 1995). There are three ways of IEP design: a program designed by a teacher, a collaborative work of a teacher and pupils on a program design and a pupil's own program design (Tryapitzyna, 2000). A developed individual educational program for each student can vary any time due to a change in initial suppositions. A program's correction is conducted by both teacher and pupils.

To develop individual educational programs, the following factors should be taken into consideration: emotional and social students' maturity, their level of knowledge, inclinations, points of view, morale values, specific features of studying, personal traits, eagerness to study a particular subject; amount of time for individual studies; accessibility and quality of the study materials; peculiarities of some subjects studying methods, forms and a studying process organization; a role and necessary level of pedagogical skills applied in particular studying processes; correlation of a studied subject with the reality; basic conceptions of a program development; a course structure.

An individual educational program design and implementation is based on teaching principles, regularities and logical links from the aim setting till the very result. These factors prove that a pedagogical algorithm of IEP design and implementation is reasonable and effective. We divided the following step-by-step algorithm of IEP design and implementation into three main blocks. Each of the blocks contains several steps to follow: selection of the project management type according to a pupils' activity; project management of each element in IEP; implementation of IEP (Karunas & Bakhtiyarova, 2011). A step-by-step design and implementation algorithm can be presented in the following figure (Figure 1):

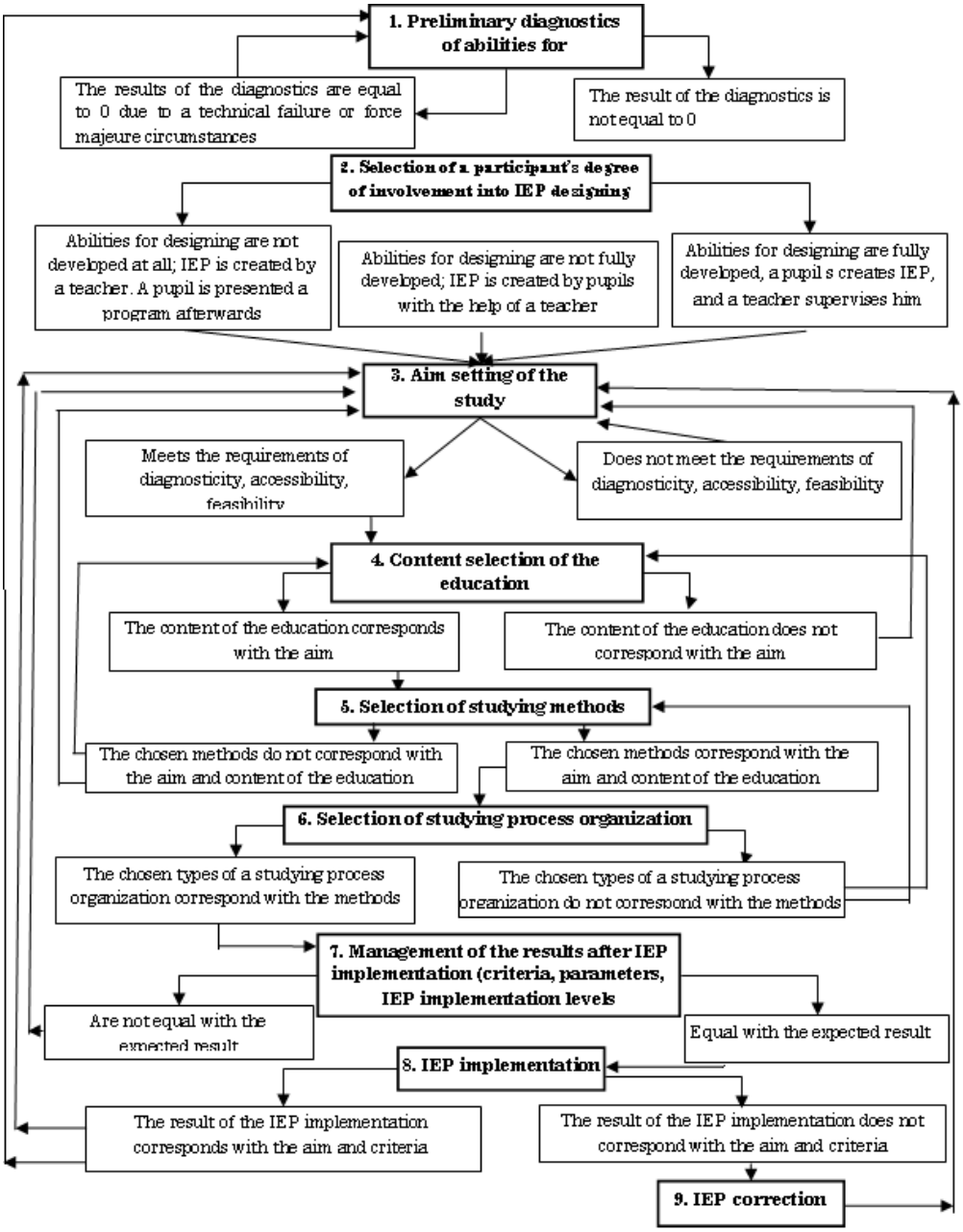

Figure 1. A step-by-step algorithm of an individual educational program design and implementation

The aim of the experimental work was to prove and check effectiveness of the revealed conditions of IEP design and implementation. The experimental work was carried out in three stages. According to the aim and content of the experimental work during the stating stage we devised criteria, parameters, diagnostics methods of an individual program acquisition level; formulated a hypothesis; defined and reasoned from a theoretical point of view organizational and pedagogical conditions of an individual educational program implementation for children taught at home.

The following conditions were defined: a pupil's participation in IEP design; differentiation of types of an individual work according to pupils' abilities; monitoring of achievements in studies which helps to correct an individual-oriented educational process in due time. At this stage we measured the level of IEP implementation with the help of the following methods: questionnaire, recitation, communication with pupils and a teacher, colloquium, testing, observation, self-evaluation, expert evaluation, examination of the studying materials (individual and control works, creative works, etc.), pupils' progress analysis, etc.

The results of the diagnostic control procedure on IEP implementation at the stating stage of the experiment showed that the majority of pupils (70 %) had very low educational results and 20 % of them had medium results (Diagram 1). Pupils at the high level were characterized by an algorithmicc (reproductive) type of activity; at the medium level pupils had some skills in a heuristic (productive) activity; pupils at the low level were characterized by a research (creative) type of activity. The pupils demonstrated their knowledge and partly applied basic notions, facts, rules, principles in their work; it proved their low level of a subject material acquisition.

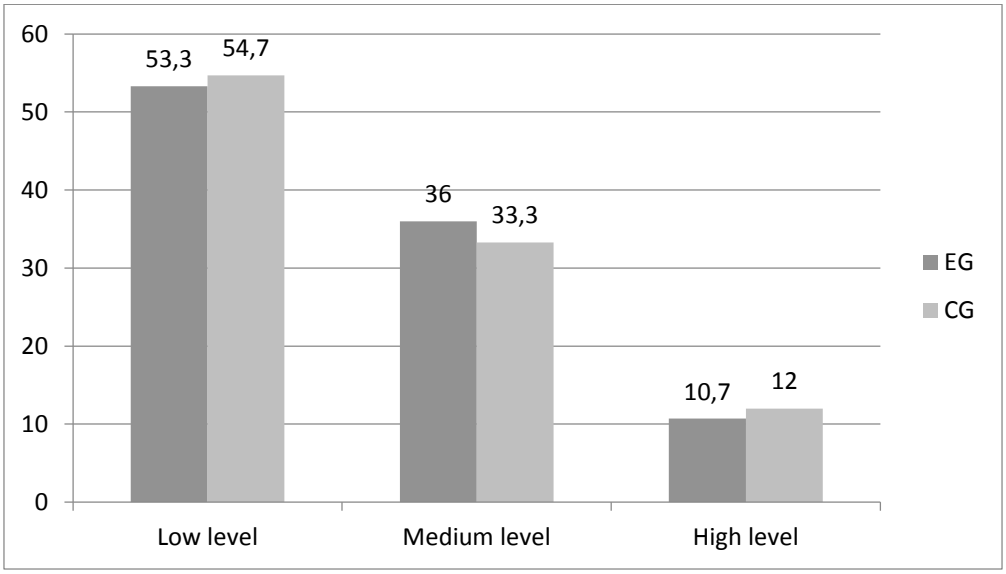

Figure 2. Pupils' results level distribution according to an individual educational program implemented during the stating stage of the experiment

Most of the pupils had difficulties in using mathematical terms and symbols and were not eager to cooperate with teachers and other people; they were supervised by a teacher only when they solved tasks and searched for necessary information. This showed their low level of universal educational skills development. A low level of their personal results development reflected in a lack of a motivation for further studies in mathematics and inadequate pupils' abilities evaluation.

During the research several problems were revealed: a differentiated approach in an individual work organization according to motivations, opportunities and pupils' abilities was not fully implemented; a system for pupils' educational

achievements which could provide a regular control, estimation and correction of a teaching process was not fully developed; not all pupils were involved in the process of their own educational route creation based on individual abilities, opportunities and needs revealed with the help of diagnostics.

At the formation stage of the experiment we tested organizational and pedagogical conditions of an individual educational program implementation. During the IEP design a pupil was actively involved in all the stages starting from an aim setting to a selection of a variable educational content, its level and pace of acquisition; a pupil also selected control methods and estimated acquisition results.

An individual pupil's work is an important part of an individual educational program creation. An individual pupil's work is a kind of activity when a pupil gets educational tasks and some guidelines necessary for the task fulfillment created according to a particular algorithm which is selected by a teacher. The tasks are carried out with a direct teacher's involvement, but a teacher in this case acts as a supervisor. An individual work includes: control, creative and practical tasks; reports, summaries, research projects, etc. This kind of work can be fulfilled during the whole period of a subject study and it is not strictly regulated. An individual work consists of tasks differentiated according to levels of educational content acquisition.

The practical work proved the effectiveness of an individual work described in a technological education schedule which is drawn for each section of a study and reflects topics of a particular subject. Each topic description contained aims formulated according to the results of education and expressed in pupils' activity.

In order to conduct diagnostics of each aim realization tasks were presented in different forms: tests, questions for a colloquium, practical work, etc. A technological education schedule also contained keys to all the tasks so that pupils could check their results themselves. A teacher checked for pupil's errors and analyzed possible difficulties. The results obtained from many technological education schedules for each section were combined into one final technological education schedule. Analysis of the final technological education schedule could help both a teacher and pupils trace effectiveness of an individual educational program implementation.

Educational achievements monitoring helped to adapt to pupils' needs and correct an individual educational program. To conduct an effective monitoring in education, information must meet the following requirements: it should be complete, relevant, adequate, objective, precise, timely, accessible, continuous, structured and specific for each monitoring level. All the requirements mentioned were the main features of a monitoring process. On the basis of the theoretical material described above we created and implemented the monitoring program of pupils' educational achievements according to an individual educational program.

At the first stage (regulative and establishing) we worked out regulative documents for a monitoring research, defined criteria describing an object's condition in many stages (initial, intermediary and final), selected a set of evaluation tools. The main aim of the educational achievements monitoring in our experimental work was to trace the dynamics of pupils' educational achievements. Personal, subject and general educational achievement results were the criteria for our monitoring. Not to cause stress among pupils, we used gentle such teaching methods: colloquium, observation, analysis of activity results, etc.

At the second (diagnostic) stage, which was the main stage of the monitoring process, we selected information with the help of the defined diagnostic methods. To obtain reliable information, we had to use several complementary methods instead of only one. These methods were: testing, colloquium on a studied topic and individual creative work resulting in an accomplished project.

During the third (analytical) stage we processed and systematized the information which was further used at the following stages of the pupils' educational achievement. The obtained information was then presented in tables, diagrams, etc. The aim of this stage was to forecast further development of a pupil's abilities. At the same time we were interested in a personal pupil's pursuit to follow his or her individual educational program and in pupil's own consideration of the question: how did his or her abilities develop during the educational process? On the basis of the results obtained during the object monitoring analysis we defined reasons for pupils' deviations in an educational material acquisition and made a diagnosis whether a pupil acquired an educational material or not. If necessary, we worked out an individual educational program for correction and developing work.

At the fourth (activity-oriented) stage, if we noticed some systematical difficulties during pupils' process of learning, an individual educational program was corrected according to a special plan. Whenever necessary, we changed a pace of a studying process, a content of studies, controlling means, self- control methods, etc. If we noticed a single case of a difficulty in studies, we defined the reason and then tried to eliminate it.

During the fifth (final) stage, which closed the pupils' educational achievement monitoring, the experiment results were analyzed; we specified pupils' level of educational development, defined effectiveness of our work on the basis of logical and comparative analysis of the results and forecasted further educational development strategy for the monitoring object taking into account lack of the knowledge revealed during the experiment. Comparing the diagnostic data with the expected results we realized that our management solutions were appropriate. Such a comparison helped to correct, change methods and teaching forms or to assess effectiveness of the expected results. During this stage we created a full characterization of an educational achievement monitoring object and elaborated further ways of a pupil's educational development.

To assess a level and dynamics of an individual educational program acquisition at the control stage, we conducted diagnostic assessment based on the same methodology applied in the stating stage. The results of the control assessment revealed some changes in all the criteria of the stating stage, but these changes were significant only in the experimental group where we noticed a change in quantity of pupils with a medium educational level (60 %) and a high educational level (28 %) of an individual educational program implementation. In the control group there was no such a significant change in a level of pupils' abilities development. The changes which happened during our experimental work allowed to trace general dynamics of an individual educational program of children taught at home (Diagram 2). Significant changes in personal and universal ability results were noticed due to a forming effect of our work.

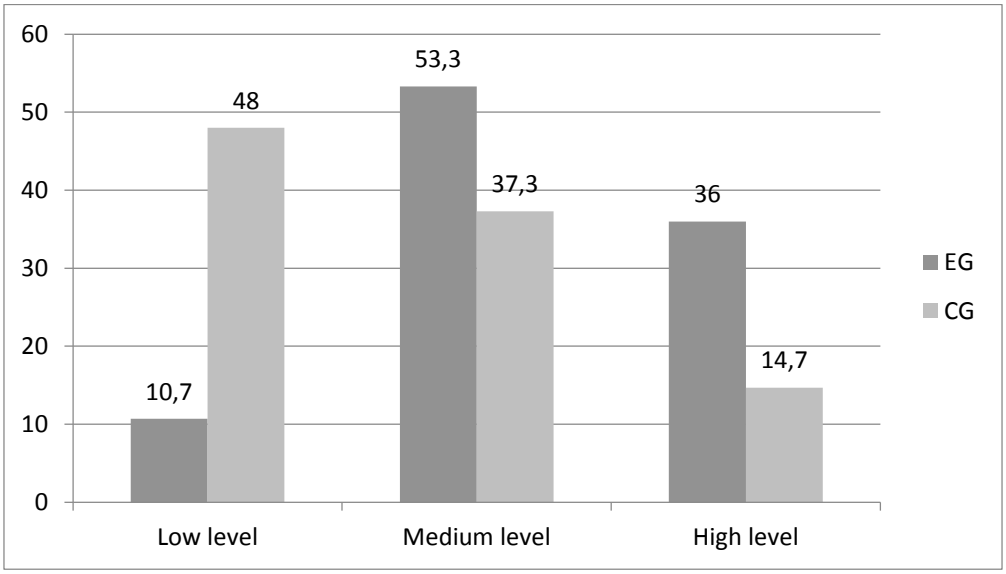

Figure 3. Pupils' results level distribution according to an individual educational program implemented during the control stage of the experiment

Therefore, we can assume that the present changes in levels of an individual educational program acquisition by the pupils of the experimental group were not caused by occasional reasons but were a consequence of complex organizational and pedagogical conditions realization created during our research.

Analysis of the pupils' achievements dynamics in the experimental group shows that defined implemented organizational and pedagogic conditions can help to enhance effectiveness of a teaching process based on an individual educational program. Thus, we can assume that our statements formulated at the beginning of the research were right.

Discussion and Conclusion

However, even though there is a significant base of scientific works and sources for this issue, some aspects of an individual education according to a modern system of education are not fully studied by Russian and foreign experts in pedagogy. Some issues connected with comprehension of an 'individual educational program', its interpretation in a modern pedagogy and in present social and economic conditions are yet to be clarified. At the moment there are no scientific works concerning this issue which could provide a complex consideration of all aspects of processing and technological bases for an individual education algorithm or could offer possible organizational and pedagogical condition for an individual educational program project arrangement and implementation.

During the experiment we found out that implementation of differentiated tasks in an individual pupils' work, a gradual transition from a reproductive individual work to a creative one. This transition means that a pupil's activity slowly becomes more sophisticated during studies of a particular subject and that a pupil's motivation increases. Comparing the results of two groups we defined that pupils in the experimental group following an individual educational program

changed significantly their attitude towards studied subjects to the positive. Generally, the diagnostic results showed increasing significance of education and a greater pursuit for an individual success as a personal value which develops a pupil's conscious attitude to a studying process.

Dynamics of personal pupils' development change shows significant increase in the quantity of pupils with a high level of individual work and creative activity, a strategy for a success achievement, while in other group these criteria were not so significantly changed. Observation of the pupils in the experimental group, communication with them and other teachers involved allow us to assume that pupils gained more satisfaction form a process of communication; they started to pay attention to personal features of a partner, try to understand and accept his or her individuality. Moreover, they developed their cognitive needs, became motivated for a success in their individual work, gained more confidence in their abilities and formed their attitude to an educational process as a personally significant process. The obtained data let us assume that our experimental work on an individual educational program implementation resulted in growth of all the parameters on all studied levels.

Implications and Recommendations

The conducted theoretical analysis of philosophical, psychological, pedagogical, scientific and methodological sources on the issue allowed us to clarify the essence of the notion 'an individual educational program'; we consider it as an adapted integral pedagogical system aimed at particular pupil's needs encouraging pupil's personal development. This system includes aim-oriented, cognitive, technological, diagnostic and result-oriented components. During our theoretical research we defined the following main components: aim-oriented, cognitive (reflects the content of a particular individual educational program); technological (includes pedagogical technologies, methods and set of methods, educational and upbringing systems used during the experiment); diagnostic (reveals diagnostic procedures); result-oriented (describes the expected results).

During the experiment we paid attention to realization of the components which had not yet been properly studied, i.e. aim-oriented, technological and result-oriented components.

A step-by-step reasonable pedagogical algorithm was carried out and implemented. This algorithm served as a technological base for an individual educational program design and realization and consisted of the following steps: introductory diagnostics for an ability to design; defining a pupil's involvement into an individual educational program creation; aim-setting; selection of the educational content, methods and teaching forms; forecasting of the individual educational program implementation results; selection of acquisition criteria, correction of an individual educational program. The following algorithm allowed implementing an individual educational program as effectively as possible.

We managed to define, substantiate and test organizational and pedagogical conditions encouraging an individual educational program implementation (a pupil's involvement into an individual educational program project arrangement; differentiation of tasks for an individual pupil's work; pupils' educational

achievements monitoring which helps to correct an individual-oriented educational process in due time) and other significant theoretical and practical results.

In the research we characterized levels of individual educational program realization; each of the levels differs in quality and reflects age peculiarities, individual features and results of socialization at the previous stage. However, even though we realized that each stage has its own features and results, we found common tendencies proving effectiveness of an individual educational program. During the research we defined and characterized the initial, medium and high levels of an individual educational program implementation.

During the present experimental work we found out new issues to be considered and solved in future. The problem of education of those who study at home according to various programs of self-education is quite relevant. It is necessary to continue research to work out a set of methods for an individual educational project implementation for pupils taught at home and to find solutions for training of a teacher in secondary educational establishments who can implement and practice widely an individual educational program.

Acknowledgement

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Gulnaz R. Yunusova is Assistent of the Department of Pedagogy and Methodology of Primary Education at the Institute of Psychology and Education, Kazan (Volga region) Federal University, Kazan, Russia.

Ekaterina V. Karunas is PhD, Associate Professor of Bashkir State Pedagogical University named after M. Akmulla, Ufa, Russia.

References

Andreev, V. I. (1966). *Pedagogics of a creative self-development*. Kazan, KSU, 567 p.

Babanskiy, Yu. K. (1989). *Selected pedagogical works*. Moscow, Pedagogika, 560 p.

Bezrukova, V. S. (1999). Pedagogics. Projective padagogics, Ekaterinburg: Delovaya kniga, 344 p.

Karunas, E. V. & Bakhtiyarova, V. F. (2011). Algorithm for projection and implementation of an individual educational program. Modernization of a higher professional education system in a technical university: materials of *II all-Russia scientific and practical conference with foreign participants. Kumertau, Russia; branch of the Ufa_State Aviation Technical University,* 135-141.

Khutorskoy, A. V. (2005). *Set of methods for an individual-oriented education. How to teach differently?* Moscow: VLADOS-PRESS, 383 p.

Kirsanov, A. A. (1982). *Individualization of an educational process as a pedagogical problem*. Kazan, KGU, 225 p.

Labunskaya, N. A. (2002). Types of individual educational routes in a pedagogical university. *Universiteskiy district, 3*, 60-62.

Lezhneva, N. V. (2000). *Theoretical bases of an individual-oriented education in primary schools* (Doctoral dissertation). Chelyabinsk State Pedagogical University, Chelyabinsk, Russia, 436 .

Serikov, V. V. (1998). *An individual-oriented education: search for a new paradigm*. Volgograd: VSPU, 164 .

Tryapitzyna, A. P. (2000). *Educational program – a route for a pupil*. Saint Petersburg: UIPK, 228 p.

Unt, I. E. (1990). *Individualization and differentiation in education*. Moscow: Pedagogika, 188.

Vorobyova, S. V. (1999). *Theoretical bases for educational programs differentiation*: PhD Thesis. The Herzen State Pedagogical University of Russia, Saint Petersburg, Russia, 460 p.

Yakimanskaya, I. S. (1996). *An individual-oriented education in a modern school*. Moscow: Sentyabr, 96 p.

Zair-Bek, E. S. (1995). *Pedagogical projection bases*. Saint Petersburg: RGPU, 234 p.