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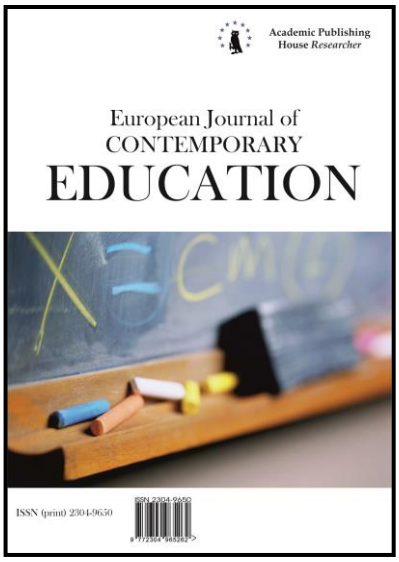

Model of Distant Learning Educational Methods for the Students with Disabilities

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Abstract

The present paper represents the results of the studies done at the Udmurt State University with assistance of the Russian Humanitarian Scientific Fund (project 14-16-18004). In the course of studies e-learning educational methods for the students with special educational needs were developed, approved and implemented in educational process. Features of training and educational activity motivation, as well as attention span, time history of working efficiency and interpersonal relations, peculiar properties of logical thinking and coping behavior of the group of the students of "Law" department were revealed in the process of stating experiment. On the basis of psychology and educational features of the group under study, we developed the integrated educational methods of training matching the features of disabled students. The technology includes both traditional and innovative methods of training. During the pedagogical experiment it was proved that application of active methods of training in educational process increases educational motivation makes active informative activity and improves the interpersonal relations that positively influences the process of professional adaptation in modern society. The results received during the experiment can be used by the teachers realizing e-learning of disabled students, managers of educational sphere organizing e-learning of students.

Keywords: e-learning, special educational needs, disabled student, educational methods, active methods of training, mode of study, teaching method.

1. Introduction

In our modern age knowledge is the necessary tool of tasks solution both in professional and personal spheres.

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At the same time it is necessary to consider that demand for education arise for representatives of various sections of society. It inevitably results in stiffening of requirements to training organizations and enabling of self-education.

The satisfaction of educational requirements demands consideration not only specifics of the studied discipline, but also specific features of students. Students show interest in different spheres of professional activity, have various level of basic preparation, feature of the organization of the informative sphere of the personality. Each of them has specific picture of the future profession and possibilities to use the gained knowledge. One educational group can unite persons with the high level of educational background, and those who meet the minimum volume of qualifying standards. This is especially the case of disabled people having difficulties in getting the high-level education.

One of the ways to solve this problem is development of training courses, creation of textbooks and study guides in the form of the electronic educational resources (EER) taking into account the principle of training individualization.

Free access to information educational resources of all population of Russia including persons with special pedagogical needs led to change of educational paradigm of the information society. Development of information and communication technologies created essentially new conditions of educational evolution.

However there is a set of problems connected with the organization of educational process of disabled students. These are psychological, physical and system-base barriers. Because of the existing physical violations students cannot regularly attend classes in higher education institutions. The traditional forms and methods of training in higher education institutions are often unacceptable for the students claiming ad hoc approach. Features of a disease also hinder full integration into educational process of ordinary student's group. Modern information technologies allow getting online education in institutions of different levels. Such educational form allows creating significant opportunity for disabled students to acquire knowledge taking into account their personal features.

Need of e-learning implementation, or, at least, online courses, is understood in all higher education institutions of Russia and other countries. Every institution develops technology of training and mentoring of students in its own way. Unfortunately, lack of a uniform paradigm of distance learning will not allow creation of uniform educational virtual space of e-learning with a possibility of remote courses exchange, creation of uniform global audience for collaboration over practical tasks, projects, joint speakers' branch, etc.

However, proceeding from the principles of training individualization, it is necessary to investigate psychology and educational features of the group of students with special pedagogical needs.

One of current problems of the present is improvement of quality of higher education. It is multipurpose problem directly connected with change of functioning of the higher education, transformation of all educational process in general and change of education purpose. At implementation of training the real purpose of education is not just obtaining of ready professional knowledge and skills, but acquisition in the course of training of core competency, such as readiness for decision-making, readiness for use of information and communication technologies, readiness for social interaction, communicative competence, etc., that is provided by educational standards of new generation. In Russia it is caused by transition to the European system of education providing competence-based approach to training (Khutorsky, 2005). Change of the purposes and problems of education demands change of technology of the organization of the whole educational process. It is necessary to realize transition from the centralized model of knowledge transfer in which a teacher telling knowledge to a student is a center to the model in which center is a student supported by a teacher in definition of the training purposes and reaching them (Yakimanskaya, 1996). Reconsideration by the teacher of own role in educational process and mastering the new pedagogical technologies based on learner-centered approach to training is urgent task in Russia today.

2. Purpose

Purpose of the present study is design of educational technology of distance learning of students with special educational needs. According to the document "Methodological

recommendations about Management of Educational Process for Training of Disabled People and Individuals with Disabilities in the Higher Educational Institutions including Equipment of Educational Process" of April 08, 2014 AK-44/05vn. The present document recommends adapting of educational programs and educational methodological support of educational process to the needs of disabled people and individuals with disabilities. Information technologies allow access to information in available forms depending on nosology. Web content has to be available for a wide range of users with health limitations (disorder of hearing, sight, musculoskeletal system, speech, mental sphere, and also combined disabilities). The teaching material has to be available to all the categories of students. The special efficiency is gained by a combination of individual and group methods of training with the use of modern distant technologies and innovative methods of training.

3. Materials and methods

The Purpose of the present study is examination of process of distance learning of the students having disability. An object of research is the model of teaching methods with the use of distant technologies and e-learning. The authors used the following methods: carrying out the theoretical analysis of the approaches to training of the students with disabilities as at inclusive, so at e-learning in references; modeling of the process of distance learning in the conditions of the university. The training process was simulated according to the approaches developed for teaching of students in stationary and virtual realities (D.B. Elkonin, V.P. Ovechkin, A.G. Rivin, T.V. Kudryavtsev); the system approach providing the analysis of an object of research; the competence-based approach allowing to correlate the virtual environment of education to the needs of students with disabilities and the social service procurement through the Available Environment program. The logic of the research was constructed in such a way that, proceeding from psychology, educational and physiological features of disabled students and the developed technology of training in the conditions of e-learning, there were created conditions making education to be accessible for the students with disabilities.

Tactics of the study was intra group experiment.

4. Discussion

We investigated such educational and psychological features of students as motivation of learning in higher education institution, motivation of educational activity, attention span and performance distribution, and also features of coping behavior of students. The group of six students studying at the educational department "Law" participated in the study in the distant form. The purpose of the “Stating Experiment” was identification of psychology and educational features of the students with disabilities of various etiologies and learning in one group. The research of motivation was conducted by the means of several techniques: motivation of training in higher education institution (technique of T.I. Ilyin) (Mironov, 2005), and technique of research of educational activity (variant II) modified by A.A. Rean (Rean, 1990) and V.A. Yakunin (Yakunin, 1994). The research of attention span and performance distribution was conducted by means of the Schulte tables. Test of Ravena was the tool for logical thinking research.

The study gave the following indices. At the high level of motivation to training knowledge acquisition is students’ number one concern, then obtaining the diploma follows and only on the third place there is learning of trade. Another, not unimportant factors of successful educational activity are attention, working capacity and operational efficiency. The intensity of these factors is considered at the choice of a technique and didactics of training. Performance distribution had linear character with slight increase of time. The overall performance, expectedly, is individual within average values with a decrease tendency to the end of a task, and depends on a student disease.

In order to improve effectiveness of performance of educational tasks at the beginning of the lessons it is expedient to offer the tasks demanding the maximum concentration of the student’s attention. The attention also tends to decrease in the course of tasks fulfillment. That is the number of the tasks of the middle difficulty level solved during one in-class lesson should not be very big. Or solutions of tasks have to alternate with other types of activity. Degree of getting into the swing of work demonstrates that examinees need more time for preparation for the main work. The indicator of mental stability (according to Ravenna) corresponds to good mental resistance to

those types of educational activity where students are to perform tasks attentively. The level of development of intelligence showed average value for this age group.

At the second investigation phase we conducted a group research on coping behavior which consists in the most effective adaptation of a person to requirements of a difficult or even extreme situation.

The results were yielded by mean values of reaction to a stressful situation. The concept of "coping behavior" is used for the characteristic of ways of behavior of a person in various difficult situations. For the students having problems with health and studying, actually individually with limited level of communication at tasks fulfillment, communication can be considered "a difficult life situation". The technique of research of resistance to stress and social adaptation (Holm, Rage) revealed the average level of resilience to a stress. Having analyzed an average picture of emergence of a stressful situation, it is possible to note the following stress-producing situations: all the situations concerning own health and health of relatives (that is, actually, natural for the people having disabilities), changes in the modes of training work, rest and social activity. However the integrated indicator of psychological tension gave mean indices. It indicates presence of deadaptation and psychological discomfort in the period of the experiment fulfillment. It is possible to explain such a discomfort with the beginning of a new semester, with the advent of new school subjects and new teachers. Requirements of the teachers who for the first time started training of students in the remote mode in general and disabled students in particular is the reason of the increased tension to a students, cautious attitude, fear to do something wrong or to lag. That is why it is necessary to develop standard requirements for provision and realization of teaching situation. Of course, it is very difficult to make everybody to work to pattern, but these efforts will return to a teacher in the form of effective work of the educational group (Baranov et al., 2014; Neskoromnykh et al., 2017; Naumova, Vytovtova, 2014). For estimation and analysis of amplitude attributes with the use of basic indices there were chosen the following indicators (see Fig. 2). That is why selection of definitive educational methods taking into account individual features of the students with special needs is our next task.

At the third stage of our research, after approbation of the training courses developed by us, we started design of educational technology taking into account the data obtained when carrying out the stating experiment. At the stage of selection we considered the following educational technologies:

- Traditional (reproductive) technology of training (the technology is focused on transfer of knowledge and skills);
- Technology of evaluative training (D.B. Elkonin, V.V. Davydov and their numerous pupils) which cornerstone is training on special level; the technology of stage-by-stage formation of intellectual actions (the theory of P.Y. Galperin, D.B. Elkonina, N.F. Talyzina, etc.) based on pragmatist approach to assimilation of knowledge and skills; technology of collective interaction (developed by A.G. Rivin with assistance of his pupils and followers V.V. Arkhipova, V.K. Dyachenko, A.S. Sokolov and and others);
- Technology of full assimilation (authors of the technology of full assimilation are the American scientists J. Carroll and B. Blum and M.V. Klarin). Basic aspects of this technology the planned results of training which have to be reached;
- Technology of split-level training which assumes creation of educational conditions for inclusion of each trainee in the activity corresponding to a zone of his next development;
- Technology of split-level training assuming flexible system of studies management taking into account specific features of students;
- Technology of the programmed training (N. Krauder, B. Skinner, S. Pressi, P.Ya. Galperin, L.N. Landa, A.M. Matyushkin, N.F. Talyzina and others). This is technology of independent individual training according to the training program developed in advance with the use of special means (the automated training environment, the special training machines, etc.);
- Technology of computer training, which represents is the technology of program training changed during scientific and technical progress including interrelation of computers and specialized tutorials;
- Technology of problem training (T.V. Kudryavtsev, A.M. Matyushkin, M.I. Makhmudov, V. Okon and others) – independent search activities of studentss for the solution of educational

tasks during which the students get new knowledge and skills, develop their abilities, informative activity, inquisitiveness, erudition, creative thinking, etc.;

- Technology of the concentrated training or otherwise the method of immersion in a subject (P. Blonsky, V.F. Shatalov, M.P. Shchetinin, A. Tubelsky, G. Ibragimov and others);
- Technology of design training (D. Dewey) which cornerstone is the solution of practical tasks of everyday life;
- Technology of the guaranteed training (V.M. Monakhov) is a model of interaction of the teacher and trainee in design and realization of educational process;
- Technology of distance learning is receiving of educational services without visit of educational institution, by means of the modern systems of telecommunication and Internet resources.

At such variety of educational technologies all of them come down to two ways of their origin, i.e. practical and theoretical: in some cases the technology arises from the theory (V.P. Bespalko, V.V. Davydov, V.K. Dyachenko, L.V. Zankov, P.Y. Galperin, N.V. Kuzmina and others), in other cases the technology results from practice (E.N. Ilyin, S.N. Lysenkova, V.F. Shatalov, V.V. Sheiman, etc.). The cornerstone of the educational technology offered by the authors is the technology of distance learning in combination with the technologies of stage-by-stage formation of intellectual actions, full assimilation, split-level training and problem training. The experiment was carried out in the conditions of the prevailing use of remote educational technologies, so students did not attend class in higher educational institution; the State Educational Standard allows it. The technology of training assumes design of content of each discipline, forms of the organization of educational process, choice of methods and tutorials. When developing our educational technology we took into account not only psychology and educational features of this student group, but also the requirements of modern educational standards, namely application of interactive and active methods of training (Mariko, 2004). Therefore forms and methods of training listed below contain references to the used by us the equipment and strategies. Some of them are applied at the organization of the distant learning for the first time.

Fig. 1 represents the model of educational technology of distant learning with health limitation.

Forms of organization or distant learning for students with health limitation:

- **Frontal.** This form is chosen as far as with its help the basic theoretical provisions of a subject before fulfillment of practical works will be stated. The form underwent approbation and implemented in the teaching situation "The active lecture" with the use of the strategies "Logbook" and "Interactive lecture".
- **Individual.** Students perform work independently – the Portfolio method.
- **Group.** This form and method of a discussion will supplement each other and at joint use the discussion method will be even more effective. We chose the following strategies "Training together", "Zigzag", "Mosaic of problems", and also the strategy of problems solution "IDEAL".

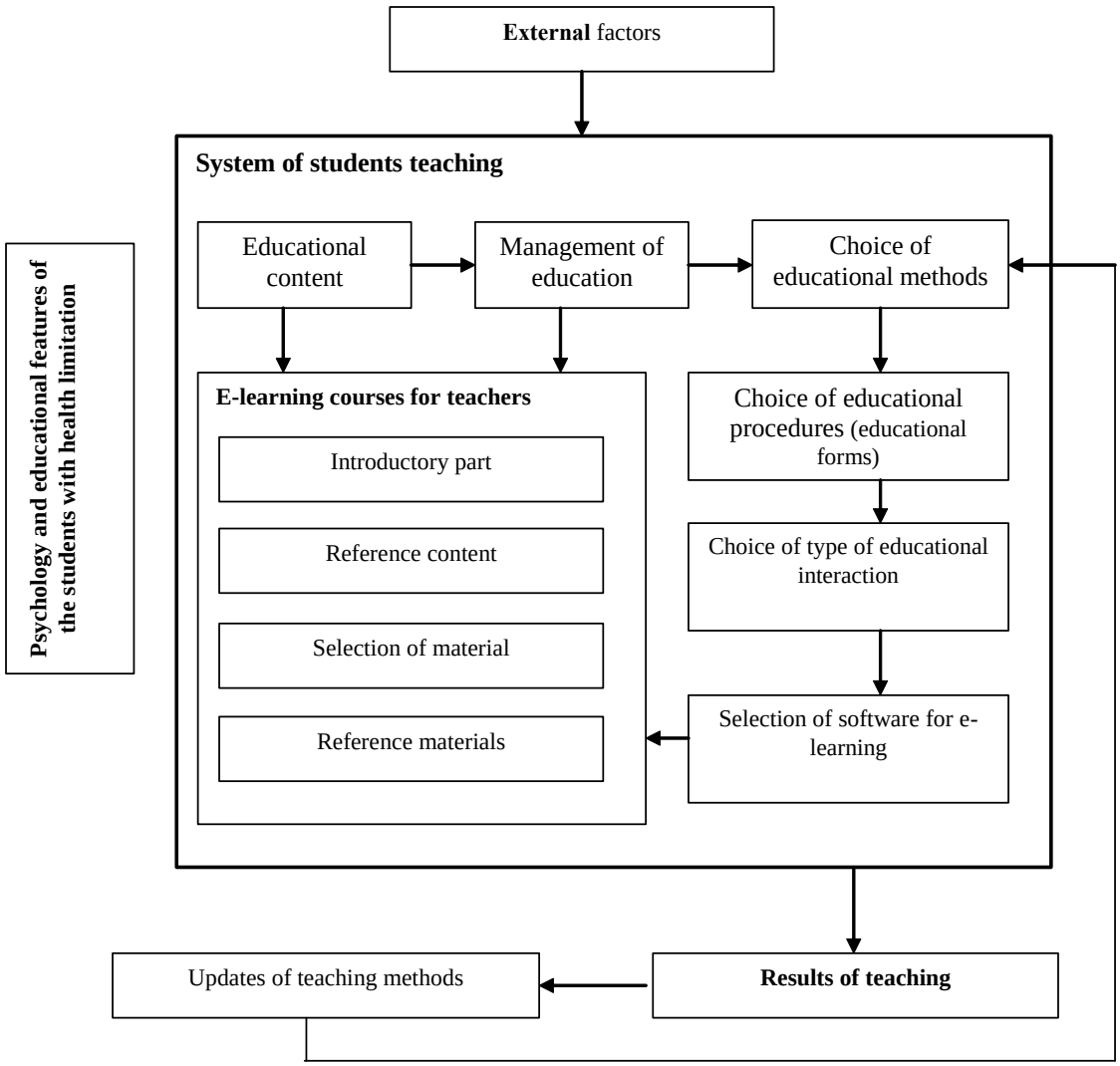

Fig. 1. Model of educational technology of distance learning

And – and now try one of the decisions; L – let's think together how to realize it), etc.

2. Descriptive method

* The illustrative and demonstrational method represent use of descriptive educational methods which in the present technique are directed to a lecture method reinforcement by means of use of an electronic board and other modern technical means. Well proved at distance learning are educational presentations and educational websites.

3. Practical method

* Making use of practical method the students will work with the modern programs and educational means for solution of educational tasks. The method is aimed at the development of liability for the work done**.**

4. Problem-oriented training

* The method of problem-oriented training will help the students to study consider and solve specific problems. Herewith using new ways and approaches, the students develop their personality and promote innovative activity namely development of initiative. Within the methods of problem-oriented training there are used such techniques as problem-oriented issue, problem-oriented situation, problem-oriented lesson and problem-oriented task.

5. The analysis of concrete situations (case study)

The analysis of concrete situations (case study) is one of the most effective and widespread methods of the organization of vigorous cognitive activity of students. Coming up against a

concrete situation, the trainee has to define: whether there is a problem in it, what is it consists in and define own position on the situation.

6. Active methods of training

Active methods of training as the methods directed to stimulation of cognitive activity of students is facilitated discussion (strategy "Reading with stops"), strategy of development of the reflexive attitude to information ("I know" – "I want to learn" – "I learned"), the strategy of RAFT (Role-Auditorium-Form-Topic**).**

7. The method of design training

The method of design training is focused on independent activity of students – Individual, pair or group, which students carry out during a certain interval of time at solution of any research task

For discussion of the results of the design group work Edward de Bono's method "Six Thinking Hats" is very effective for discussion of the results of design group work.

Tutorials:

• Electronic educational resources (the training courses developed by teachers for work on the Adobe Connect platform, the system of electronic training at the LMS Moodle platform, etc.)

• Audiovisual educational resources (educational videos, presentation)

5. Results

Upon termination of the study we repassed inquiry of students, having used the questionnaire on training results after the active methods of training (AMT). The questionnaire represents 22 polar statements, each of which was estimated on-scale from 0 to 6 points. The received results are interpreted by three categories: the educational motivation (EM), the informative activity (IA) and the interpersonal relations (IR). In the table the corresponding points of the scale are marked with the corresponding letters. Taking into account that according to each statement the maximum number of points is "6" and minimum is "0", there was calculated the total amount of points by each criterion. On the basis of the received values there were distinguished the levels stated in Table 1:

Table 1. Level of educational motivation, informative activity and interpersonal relations after the experiment

	Levels in points		
	High	Middle	Low
Educational motivation (EM)	25-36	13-24,9	0-12-9
Informative activity (IA)	35-57	19-36,9	0-18,9
Interpersonal relations(IR)	29-42	15-28,9	0-14,9
Total	89-132	45-88,9	0-44,9

Table 2 presents the comparative data obtained before and after the experiment.

Table 2. The summary table of the results on AMT technique before and after the experiment

	Before experiment	After the experiment
Educational motivation (EM)	26	29
Informative activity (IA)	23	37
Interpersonal relations (IR)	22	29

Prior to the experiment the educational motivation was estimated as high (that is confirmed by the results received by the Ilyina's technique.), informative activity was at average level, the interpersonal relations also were at the average level. After the experiment the results changed as

follows: the educational motivation was high, but changed towards increase in result, level of the informative activity became high, the interpersonal relations also moved to the high level.

Visually the results of the time history of indices obtained before and after the experiment are presented in the Fig. 2.

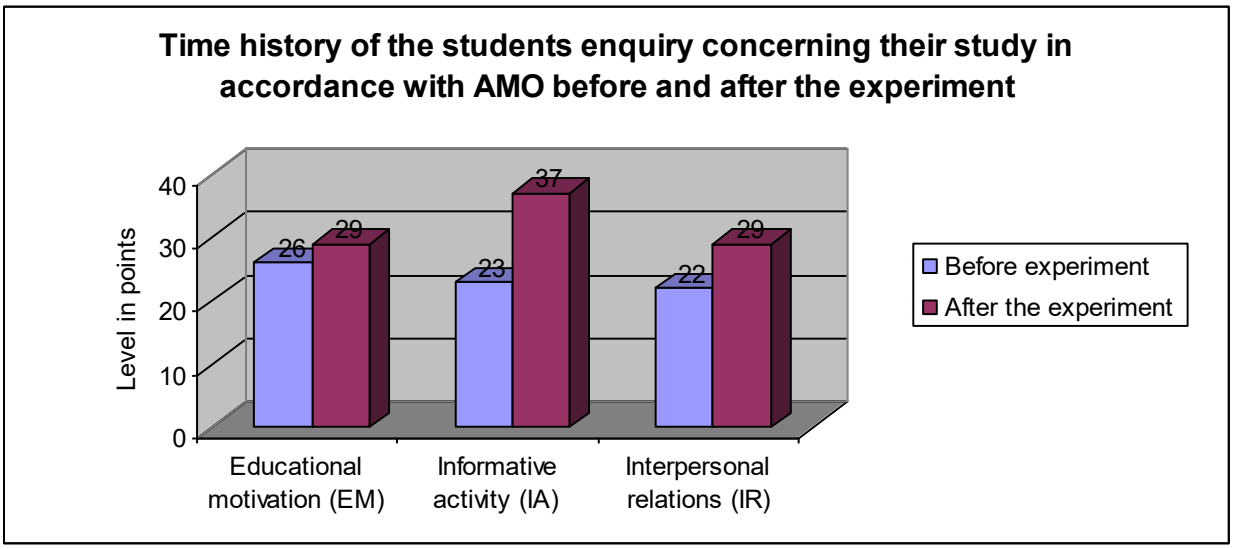

Fig. 2. Time history of indices before and after the experiment

At initially high level of motivation of the students to training there is observed weak tendency of the indicator to growth after carrying out the experiment (3 %). Growth of the informative activity (48 %) and the interpersonal relations (10 %) is considerable. If before use of the experimental technology of training only the motivation, as it was already noted, had a high rate, then after the experiment both the informative activity and the interpersonal relations received high indices, that is very important for training in the conditions of distance learning.

For confirmation of efficiency of the technology of training offered by the authors there were applied methods of mathematical statistics, i.e. T-criterion by Vilkokson, for identification of orientation and expressiveness of shifts in the same group of examinees in two different conditions - before and after use of our technology. For motivation Temp =9.5 at Tcrit =2 at 5 % level of the statistical importance that lies in a zone of unimportance of an indicator. Informative activity Temp =2.1 that is a significant indicator. Interpersonal relations constitutes Temp =1.95. The given indicator is in the area of uncertainty, but close to Tcrit =2 for 5 % level of the statistical importance that grants to us the right to consider it to be a significant indicator. Thus, it is possible to claim that the intensity of shifts in the typical direction does not surpass intensity of shifts in the atypical direction.

6. Conclusion

Therefore the offered educational methods of distant learning for the students with special educational needs based on the advances in information technology in combination with active methods of training is optimum for this educational group. It can be successfully used by teachers in educational groups with such students. Besides in the course of studies there is proved improvement of such factors as informative activity and interpersonal relations. It is very important for the distant-learning students training without direct communication with teachers and other students. Rise of informative activity bears testament that students with special educational needs (who sometimes are isolated from the whole world) are able to produce socially important transformation of material and mental spheres.

7. Acknowledgement

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8. Recommendation

The educational technology developed by the authors is option of the distance learning management for the students with disabilities of various etiologies learning in one group.

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