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MODERN EDUCATIONAL TECHNOLOGIES IN A TECHNICAL UNIVERSITY PEDAGOGICAL PROCESS

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Abstract

The quality of a pedagogical process largely depends on the technologies used by a teacher. Currently, a sufficient number of the technologies are known, and there are various classifications of them. The research questions are to view the definitions of a pedagogical technology, its main characteristics and qualities; to give examples of modern learsning and up-bringing technologies and their usage in a teaching process. The purpose of the study is to discuss different educational technologies and the necessity of their usage in a pedagogical process. We rely on a set of the following methodological approaches: humanistic, cultural, axiological, competency-based, communicative, person-centered, system-activity, professional, integrative. The main research methods are: a retrospective analysis and literature review, an observation, a questioning, an interviewing, designing, modeling, monitoring, an experiment. There are many different technologies. One of the main aspects of an educational process is teachers and students' interaction and cooperation, personal development without suppression of the will, without coercion, specific punishments. We consider the teaching technology of the teacher-innovator V.F. Shatalov and the technology of up-bringing of I.P. Ivanov. Thus, the quality of any educational process and the work of any educational institution are largely dependent on the knowledge and ability to put into practice by teachers a variety of technology training, education and development.

Keywords: Pedagogical technology, student, technological approach, technology, teacher.

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1. Introduction

The quality of any pedagogical process largely depends on the technologies used by a university teacher. A sufficient number of them are currently known; various classifications exist.

A technology (from Greek “techne” – art, craftsmanship, skills and “logo” – a doctrine, science, a law – literally) – this is the doctrine of a specialist’s skill (Davydov, 1999).

A pedagogical technology is a system with an educational process designed in advance is sequentially implemented and ensures the achievement of pedagogical goals (Bim-Bad, 2003).

A pedagogical technology is one of the specific kinds of pedagogical science (applied pedagogics) intended to provide ways for achieving certain goals, to increase effectiveness of an educational process and to assure its high level. Therefore, organizing different kinds of pedagogical activities supposes the use of elective technologies at the stage of art and excellence (Pedagogical terminological dictionary, n.d.).

In a near sense, a pedagogical technology is a methods’ collection of organizing certain steps, operations, connected with specific teachers’ activities that is aimed to achieve set goals (“a technological chain”). In this way of “a technological chain” one can suppose that an activity system of a teacher is like a chain of consecutive actions intended for preparation and holding of classes and various educational events. In general, this means students’ study process and the condition of an educational process, setting of diagnostical goals and tasks, determining perspective, forecasting results, planning an activity, an organizational activity and problem solving, the correction based on pedagogical analysis, developing a program for forthcoming actions (Rapatsevich, 2005).

Currently there are many various technologies such as a technology of pedagogical activities, a learning technology, a technology of upbringing, a technology of problem-based learning, a technology of collective creative activity, a technology of cooperation, a play technology and etc (Bylieva et al., 2018; Bylieva & Sastre, 2018; Fidan & Tuncel, 2019; Jabarullah & Iqbal Hussain, 2019; Slastenin, 2005; Slastenin et al., 2004).

2. Problem Statement

According to Bologna Declaration, one of the most important aspects of an educational process is interaction and cooperation of a teacher and a student, developing an individuality without suppressing a will, without forcing, specific punishments, which are the main conditions of pedagogics of cooperation, which emerged in the 80-ies of the XX-th century in our country, the ideas of which remain relevant and desirable in the XXI-st century not only in Russia but abroad.

These researchers V.F. Shatalov and I.P. Ivanov are the followers of pedagogics of cooperation. It should be noted that processes of learning and upbringing are interconnected and interpenetrated.

The technology of intensification of education based on scheme and sign educational material models for middle and high school stages of the USSR teacher V.F. Shatalov (born in 1927) is mainly directed at teaching pupils, allows to solve various pedagogical problems: harmonic individual development, stage control of any educational activity of pupils, upbringing an educational individuality in students as a good feature of individuality, constant interest to learning, providing deep knowledge,

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adjusting each student to daily and tough educational work, strengthening self-assurance, activity, helps to terminate students' overworking and to prepare growing generation for work in the society.

The technology of V.F. Shatalov finds its supporters both in the world of science and in the world of practice. There are the following defined goal orientations of V.F. Shatalov's technology. They are forming knowledge, skills, abilities and learning ways of intellectual work; teaching all children with their individual characteristics; liquidation of academic failure; sped up education (education for 9 years that takes in all volume of secondary school); upbringing of hard work, independence, five day work week; daily physical exercises.

The analysis of Shatalov's works allowed to determine the main principles of his method, one of which is the principle of publicity. However, this principle is not always correct in the context of humanistic education. For example, one shouldn't present students grades for everyone to see, but it is important to allow students to correct their grades at any time, it is necessary to invite teachers and parents to class. The principle of constant feedback allows to objectively note and control knowledge of each student at each lesson. To prevent didactic contradiction the principle of conflict-free educational situations is used. The principle of open prospects is focused on the development of students' creative thinking. The principle of the same conditions for everybody provides class with psychological comfort, idealistic stillness and public respect. One of the principles of Shatalov's (1980) methods is the following. A theory is the first, and practice is the second ("only having learnt a theory, one may start the practice" (p.17). The principle of systematization is done in systematic work on materials both during lessons and at home. The problem principle could be successfully developed on the stage of new learning material presentation. The principles of harmonic development of reproductive and productive thinking, learning on the basis of variative and continuous revising, combination of persistent outer control during the process of learning and its assessment by self-assessment, necessary stage by stage control, using reference signals, high level of difficulty, a dynamic stereotype of activity, an individually oriented approach, education without force provide students for more effective education. The principle of collectivity is actively shown during tests, problem solving, practical and laboratory assignments, when a group of students is organized, taking their interests into account while forming groups. The principle of education and upbringing combination is important in this combination.

The principle of humanism (all children are gifted), love and respect towards children, towards their skills is the basis for forming high moral ground of an individual during their educational activity.

Doctor of Pedagogical Sciences, Professor, Academician of Russian Academy of Education I.P. Ivanov (1923–1992) was one of the active followers of the unique experience of educating teachers of the 20s and 30s of the XX-th century, A.S. Makarenko, S.T. Shatsky, N.K. Krupskaya, V.N. Soroka-Rosinsky and others (Korotaeva, 2007a; 2007b; 2008). Developing their pedagogical ideas, I.P. Ivanov developed the pedagogical foundations of the educational process, the formation of individuals capable to work in a team; opened ways to improve the social life of students, created a communal methodology in which teachers and pupils are equal subjects, and the result of its application is manifested in the development of civil self-consciousness, students' ability for social creativity, their concern for the common good. The purpose of this technique is to educate a socially active creative person, capable to

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increase social culture, make a contribution to the construction of a legal democratic society (Selevko, 2006).

The analysis of I.P. Ivanov's works made it possible to single out the main conceptual ideas of the technology of an innovative teacher: collective activity as a means to create a powerful creative field; a personal approach; creation; care; cooperation; self-up-bringing, self-learning, self-improvement of both educators and students; a dialogue of all; respect for the student's self and his unique position in the world; partnership and generational relations; conscious demanding of everyone to themselves and to each other; voluntary division of labor; moral and humane relations of all participants; nature conformability; spiritual and moral enrichment of an individual; the role of the teacher's personality in an educational process; social orientation of an activity; self management; collective self-development et al. I.P. Ivanov singled out five conditions for pedagogical success: common care, companionship, unity of thoughts and actions, will and feelings, a single team, creativity.

In the works I.P. Ivanov pays a great attention to the role of a team, which is an important component of the holistic pedagogical process and in which the formation of personality takes place. The purpose of the team is to contribute to the growth and flourishing of every person whose need is the concern for the welfare of other people, creativity, self-education, and the most important condition for educating collectivists is a holistic system of educational relations – real (common care) and spiritual (comradely respect and demanding) (Kodjaspirova & Kodjaspirov, 2005; Selevko, 2006).

It should be noted that V.F. Shatalov and I.P. Ivanov developed his technologies for school pupils, but our practice has shown that they are also suitable for university students and can improve the efficiency and quality of the pedagogical process (Orekhova et al., 2018).

Then we will consider the technology of play activities, which can be actively used both in a secondary school and in a high school. So, the main links of the game activity technology are: preparation, implementation, analysis. Each link as part of a whole includes certain actions of a teacher and a student in preparing, conducting and summing up (analyzing) a particular game respectively (Ksenzova, 2004).

For example, the preparation unit provides for the selection of a game, the setting of a goal and the development of its program. Carrying out the game is the embodiment of the program in an activity, the implementation of the functions of each participant in the game. Then there is the game itself, taking into account the rules, attributes, etc. The summing up of the game provides for a collective analysis and assessment of the actions of its each participants.

In the existing classification of educational technologies, the technologies of developing learning are singled out: personality-oriented, subject-oriented, playing technologies, etc. The aspect of preserving the health of students is not singled out as the main one. The main component of any educational technology is the following. The goals and objectives do not reflect the health-saving aspect of education, which is the most relevant in our time.

In this situation, it is important for a teacher to be able to refract didactic categories in educational technologies so that they guarantee the health-saving nature of learning. The most relevant and top priority is the proper structuring of the content, highlighting the key lines, basic concepts, patterns, interdisciplinary connections and thinking through them on the basis of a rational logic of a learning

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process. For many teachers the logical-didactic analysis of an educational content on the subject is a problem, which leads to the expansion of its scope, focusing on the secondary facts and phenomena. The poor structure of the content makes it difficult to assimilate knowledge and skills and adversely affects the physical and mental state of schoolchildren. Didactic methods implemented in educational technologies do not always meet the requirements of the health-saving pedagogical process. An enthusiasm for intellectual training methods that exploit the left hemispheric regions of the brain leads to a deterioration in the emotional component of the mental health of students.

Health-saving potential has heuristic learning technologies that stimulate the development of students' creative abilities. There are methods that initiate the development of figurative thinking, imagination and fantasy, intuition. Creativity situations allow students to transfer learning loads, relieve muscle tension more easily.

The use of play methods and techniques in the technologies of training and education, their optimal combination with other methods increase the learning motivation of students, and contribute to less expensive (without stress) achievement of learning objectives. A game is one of the leading human activities that have not yet occupied a worthy place in the educational process. It has psychotherapeutic functions that allow changing the attitude of a person towards oneself (Prokhorov, 1985).

3. Research Questions

The main tasks of the article are:

- to view the main definitions of a technology, a pedagogical technology;
- to view the main ideas of the learning technology of an innovator V.F. Shatalov and the upbringing technology of an innovator I.P. Ivanov;
- to analyze these ideas and their use for a university pedagogical process;
- to give examples of using V.F. Shatalov and I.P. Ivanov's ideas in a technical university pedagogical process;
- to compare two students' groups: the innovators' methods were used in one group and were not used in the other.

4. Purpose of the Study

The purpose of the article is to view the learning technology of an innovator V.F. Shatalov and the upbringing technology of an innovator I.P. Ivanov, and to compare the results of learning activity of the two groups of university students. In one group the ideas of V.F. Shatalov and I.P. Ivanov are used and in the other group their ideas and methods of their technologies are not used.

5. Research Methods

The analysis of the scientific sources shows that, at present, teachers' practical activities , targeted pedagogical attitudes, the meaning of which is to form a competence developed creative personality of an individual, become integrative in nature and contribute to the effective and economical use of pedagogical tools in achieving their objectives.

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When organizing the integral pedagogical process at an educational institution on the basis of different technologies, we relied on a set of the following methodological approaches: humanistic, cultural, axiological, competency-based, communicative, person-centered, system-activity, professional, integrative. The main principles of the research are humanization, creativity, the unity of theory and practice, integration, continuity.

The main research methods are: a retrospective analysis and literature review, an observation, a questioning, an interviewing, designing, modelling, monitoring, an experiment. During the experiment we used chi square to analyze the results of the students' success in studying.

6. Findings

Now let's discuss the experience of Ryazan State Radio Engineering University named after V.F. Utkin in using different technologies.

V.F. Shatalov's methods of using schemes and sign educational material models are actively used by the university teachers. They may be used in English language classes, as well as Maths, Physics and other technical subjects. The subject material is presented in the form of schemes and given to the students. After they have learned the material the students say it to the lecturers.

The methods of collective creative activity, which were developed by an innovator teacher Ivanov (1994) in the XX-th century, are actively used in English classes. Collective creative activity (CCA) is a collective, as it is planned, prepared, committed and discussed by all; creative, because the creative advancements of all participants are manifested; socially important activity, the main task of which is to take care of improving a group's life, it is a mixture of practical and organizational actions for the common joy and benefit.

Collective creative activity technology includes 6 stages, which are aimed at achieving the goal: teachers' preliminary work, collective planning, collective preparation, conducting, collective summing up, the immediate effect, and allows you to include each group member in the work, prevents the need to divide students according to their abilities, has a creative and mental orientation, eliminates the possibility of conflicts between all participants (Bazhenov, 1987).

Consider the organization and conduct of collective creative activity on the example of a generalized English class on the topic "Energy Systems in Russia, Great Britain and in the USA".

At the first stage of preliminary work with students, conversations are held, their questions on the topic are clarified, specific educational and developmental tasks are put forward, various options for the case, an initial (starting) conversation are organized, the leading topic is determined.

The second stage of collective creative activity collective planning solves the following tasks: how to conduct it in the best way, who will participate, what role everybody will have, who will lead, who will organize the work, where and when it is better to carry out this activity, in what form, for example, in the form of a TV show with invited guests; selection of the council of the case (responsible for the distribution of roles, responsibilities, preparation of the material).

The third stage of the collective preparation of the case takes place in the form of clarification, specification of the plan for preparing and conducting collective creative activity, the implementation of this plan is organized, the roles are finally determined, for example, a host, interviewers, the Ministers of

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Industry and Energy from Russia, Great Britain, the USA, industrialists from these countries, energy specialists, journalists, televiewers from different countries, etc.

At the fourth stage of collective creative activity, a specific plan of the event is realized, developed by the governing body with all the adjustments that were made by its participants in the preparation of collective creative activity. The guests related to the energy problem were invited to a TV studio to discuss the urgent problems. Televiewers call the studio, ask their questions. Thus, the conversation, aimed at expanding the students' horizons, consolidating the skills and abilities obtained during previous studies, developing the ability to communicate in a foreign language with colleagues, is organized.

At the fifth stage of the collective summing up of collective creative activity, the general meeting of the participants of the case takes place, the purpose of which is to resolve issues relating to the positive aspects of preparing and conducting collective creative activity, to shortcomings and mistakes, to lessons for the future, to sum up the results of pedagogical tasks.

The sixth stage, the closest collective creative activity after-effect, serves to implement the decisions taken as a result of a collective analysis, to propose the topic of the new collective creative activity, to plan an event on the chosen topic.

It should be noted that foreign language classes according to collective creative activity method are active, interesting, entertaining. They help all of its participants to speak on a specific topic, express their opinions, listen to group mates, argue, proving their point of view. The teacher is one of the equals, directing the work, and not manifesting authoritarianism. Such classes develop the skills of monologue, dialogic utterance, solve educational (more detailed acquaintance with the culture and customs of the countries of the language studied) and educational tasks (consolidating vocabulary and grammar on the topic studied), and serve for personal development (Almazova et al., 2018; Orekhova et al., 2019; Zemlinskaya & Fersman, 2017).

Thus, despite the fact that the methodology of collective creative activity was developed in the last century, its application, bringing only positive results, is relevant at the present time.

During five years we have been conducting a survey to analyze two groups of students. We compare the students learning results in study success. The teachers of the first group of 10 students used traditional methods and the learners' progress was approximately the same. The teachers of the other group of 10 students used methods of the innovators, for example V.F. Shatalov's methods and the method of collective creative activity by I.P. Ivanov. Figure 01 shows the students' results of two groups during the 5 years (from 2015 till 2019). The educational results of the learners have grown greatly.

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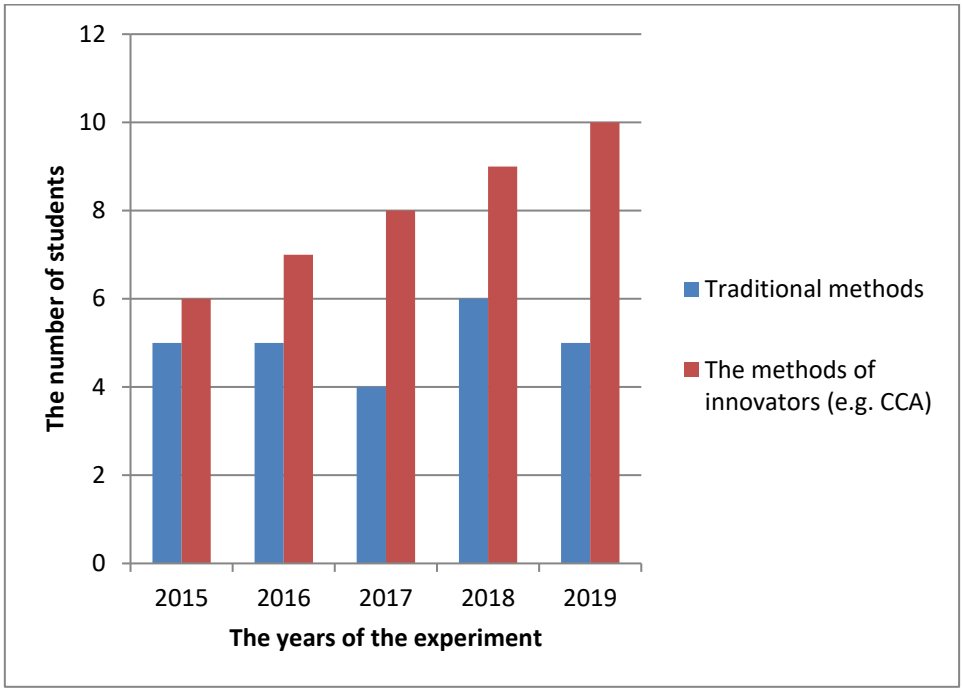

Figure 01. The comparison analysis of the two students' groups

7. Conclusion

Thus, the quality of any educational process and the work of any educational institution are largely dependent on the knowledge and the ability to put into teachers' practice a variety of technology training, education and development. Every teacher should choose appropriate technologies for different groups of students. It is very important to use different technologies in a university educational process to improve students' knowledge and their motivation to study.

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