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Pedagogical Interaction in Hugh School, the Structural and Functional Model of Pedagogical Interaction

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ABSTRACT

The study covers the problems of pedagogical technologies and their experimental implementation in the learning process. The theoretical aspects of the "student-teacher" interaction are investigated. A structural and functional model of pedagogical interaction is offered, which determines the conditions for improving pedagogical interaction in the educational process: resolving learning situations during the interaction of teachers and students; organizing interaction by combining active teaching techniques that are related to professional activity; focusing members of the pedagogical process on personal interaction and coordinating the roles of interacting persons. Monitoring and diagnostic techniques are suggested for verifying the effectiveness of the model. The paper presents the results of the study of pedagogical interaction and gives recommendations regarding its improvement.

KEYWORDS
Teacher-Student Interaction, communication, active learning methods, self-development, pedagogical process simulation

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Introduction

Education process is an arena of teacher-student communication (Valeeva, Aitov & Bulatbayeva, 2016). This way, a favorable environment for individual development is one of the premises for studying efficiency due to the pedagogical communication is a function of human communication. Contemporary education presupposes ability of a teacher to reach out to every student, students group, etc.

It means student-teacher interaction should be organized on the pedagogical laws and regulations.

Despite the fact, the research on student-teacher interaction is have being done during last 3 decades (Wubbels & Brekelmans, 2005), there are a lot of unsolved

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problem. In general, the problem of evaluation of "teacher – student communication" has the follow peculiarities:

- Absence of teacher-student communication efficiency definition;
- Lack of teacher-student communication theoretical models and simulations;
- Impossibility to make quantity measurements of communicational process efficiency and its influence on students motivation and their academic performance;
- Impossibility to develop a clear relation between mention above options (Poorda, 2012);
- Initial inequality of a student and a teacher in educational communication;
- Every student is an independent object of educational process acquires knowledge, based on our own experience, understanding and motivation (Muntner, 2008; Cadima, Leal & Burchinal, 2010).
- Every person perceives and interprets obtained information depends on his/her experience, understanding and motivation.

With that, effective interaction is characterized by the following features:

- equality and mutual respect of members of the pedagogical process in accordance with their duties;
- recognition of the student's independent cognitive activity as the dominant in the learning process;
- students' consideration of themselves as the main participants of the educational process;
- organization of the educational process in accordance with the interests and abilities of students and the gained experience, with a view to realizing potential creative abilities.

This article discusses the theoretical aspects of teacher-student pedagogical communication in order to define its influence on academic performance specifically due to psychological features of teachers and students.

The conceptual framework for the analysis and interpretation of the data includes 122 evaluations of the main components of pedagogical interactions (cognitive, emotional and behavioural). The main sources of data comprise transcripts of observation notes.

Literature Review

The participants of communication in high school are teachers and students. Unfortunately, the national academic educational environment tends to underestimate such elements of the communicative and pedagogical conduct of teachers as approval, encouragement, and communicative support of students as necessary components of the pedagogical process. This explains the fact that many creative and active students lose initiative and motivation after studying for a certain time.

The significant and crucial role of teacher–student relationships in education are reported at the scientific literature (Cornelius-White, 2007; Eschenmann, 1991 and other researchers).

In general, many studies have been carried out all over the world to study teacher–student relationships in various countries (e.g., The Netherlands, the

United States, Canada, Australia, China, and Indonesia) and various educational contexts (e.g., secondary, vocational, and university education).

All of these studies reported the significant and crucial role of teacher–student relationships in education (e.g. Fisher & Rickards, 1998; Fricke, 2012; Georgiou & Kyriakides, 2012; Henderson & Fisher, 2008; Klem & Connell, 2004; Lepointe et al., 2005; Levpuscek et al., 2012; Maulana et al., 2011; Mireles-Rios & Romo, 2010; Pianta et al., 2008; Wei et al., 2009; Wentzel, 1998; Wentzel, 2012).

The so-called "Pygmalion effect" has been a starting point for a number of studies concerning teacher-student interaction (Rosenthal & Jacobson, 1968).

Despite the first attempts to simulate and quantify the teacher–student relationships (Harris & Rosenthal, 1985), who had categorized 31 different teacher behaviors, the further attempts to define and measure quality in education have yielded limited results. Models of teacher-student interaction have most frequently sprung from general questions of educational psychology, and thus will hardly deal with the specific features of individual subjects in school (Brophy & Good, 1974; Dunkin & Biddle, 1976; Ulich, 1976). Consistent evidence suggests that to improve students' academic achievement and social skill development, we need to focus on the nature and quality of teacher-student interactions (Beutel & Denise, 2010).

We now know that many of the more commonly debated regulations intended to improve the quality of classrooms (i.e., class size, teacher education, and credentialing) are not sufficient to ensure that student make academic and social progress (McClowry et al., 2013). The two instructional models, cognitive apprenticeship and reciprocal teaching, introduced by A. Beutel & A. Denise (2010) have attracted wide attention among researchers. Although many empirical experiments using these models have been carried out in different settings with good results, there is still no evidence about the situational conditions or the ability of the individual students to benefit from different methods.

M. Muntner (2008) has proposed the Classroom Assessment Scoring System (CLASS), which describes ten dimensions of teaching that are linked to student achievement and social development. Each dimension falls into one of three board categories: emotional support, classroom organization, and instructional support. This system offers an evidence-based approach to defining and measuring effective interactions in school classrooms. High quality rating was observed for follow compounds of interaction model: emotional support and classroom organization. The author states low efficiency of this system, its dependence of student parent's income and/or education.

J. Cadima, T. Leal & M. Burchinal (2010) concluded that the quality of teacher–student interactions, particularly in terms of classroom organization, was positively associated with students' first grade vocabulary and print concepts only after taking into account family risk factors and preschool skills. The authors proposed the need of individual approach to every student to provide further support for the unique contribution of the quality of teacher–student interactions and suggested that it may be an important mechanism to improve academic skills. A. B. Frymier & M. Houser (2000) analyzed the individual mechanism of student-teacher interaction.

S. Lindblom-Ylänne, H. Pihlajamäki & T. Kotkas (2003) studied the "teacher-student" individual communication influence on general group outcomes. They claimed the best results were observed for group with participation all students into

discussion. As far as rules, roles and group practices are created during the first student meeting, the authors emphasizes the teachers of problem-based courses should, if needed, support active participation of all members from the beginning.

D. L. Poorda (2012) statistically proved correlation between qualities of teacher-student relationships (TSRs) and students' school engagement and achievement. To measure qualities of teacher-student relationships (TSRs), the author uses Questionnaire on Teacher Interaction (QTI) to collect data on students' and teachers' perceptions of the teacher–student relationship.

During the last two decades, there has been an increase in research on the importance of affective teacher-student interaction (TSRs) for students' school adjustment. Mainly, to describe TSRs, authors use Questionnaire on Teacher Interaction (QTI) to collect data on students' and teachers' perceptions of the teacher–student relationship. Despite the conducted studies, the majority of them, are still descriptive.

Aim of the Study

The aim of the present study was to explore teacher-student interaction in relation to student motivation and achievement. Based on proposed model of teacher-student interaction, the monitoring and diagnostic methods were proposed. Findings from a questionnaire administered to undergraduate students in a communication research course indicate that involvement in cooperative learning is a strong predictor of a student's academic performance.

Research questions

This work hypotheses an idea if teachers develop skills and take the time to build positive relationships, to create cultures of success and the expectation or value of such, then students should or will be motivated and able to the desire for success and the love of learning.

The following research questions and hypothesis were tested:

1. To what extent, if any is a difference in the perception of teacher-student interactions for the experimental and control group of students?

1A: Is there a difference in the perception of teacher-student interactions for the experimental and control group of students?

Methods

Based on the developed model, a monitoring system was offered, the purpose whereof is to study the level of development of the main components of pedagogical interaction (cognitive, emotional, and behavioral).

The method developed by Professor L. V. Bayborodova (2006) was used as the diagnostic method. The goal of this method is to determine the students' vision of their interaction with the teacher and to find the existing problems in the interpersonal interaction between the teacher and students. The method includes 24 assessments of the relationship with the teacher. If the student agrees with the assessment, he or she puts the "+" sign; if not – the "-" sign. The arithmetic mean is then calculated for each criterion: the number of matches of ideal and real signs is divided into the total number of phrases related to the manifestation of this criterion. The closer the arithmetic mean is to 1, the higher the development level of the criterion.

Data, Analysis, and Results

The Teacher-student interaction model description

There are three groups of methods of interaction between teachers and students in the high school pedagogical system (Figure 1).

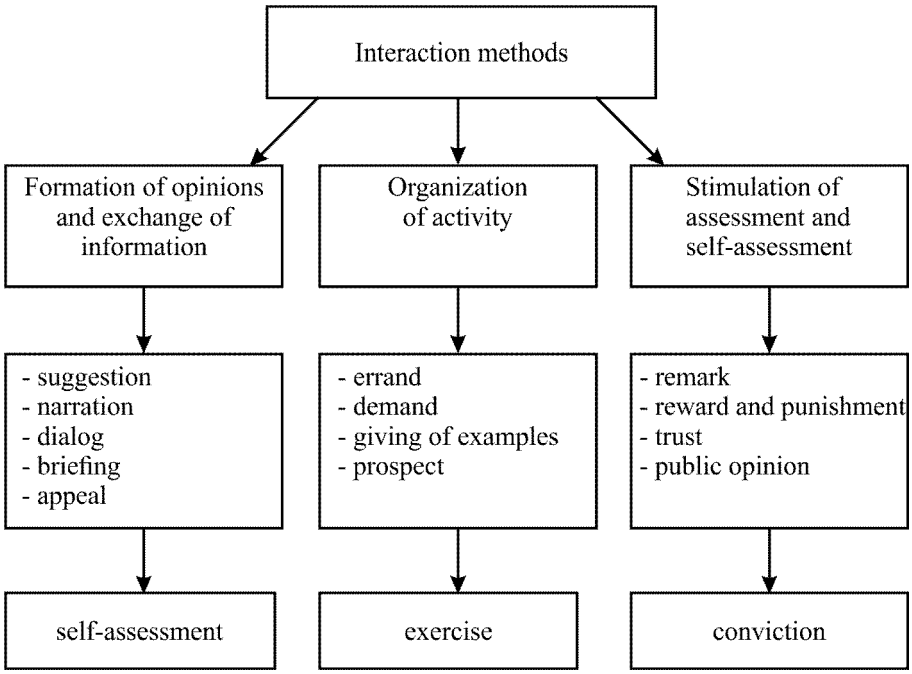

Figure 1. Teacher-student interaction methods

This group of methods helps to develop unity of the consciousness and behaviour.

Based on the above, a structural and functional model of pedagogical interaction was developed (Figure 2), which includes the main elements of subject-subject interaction.

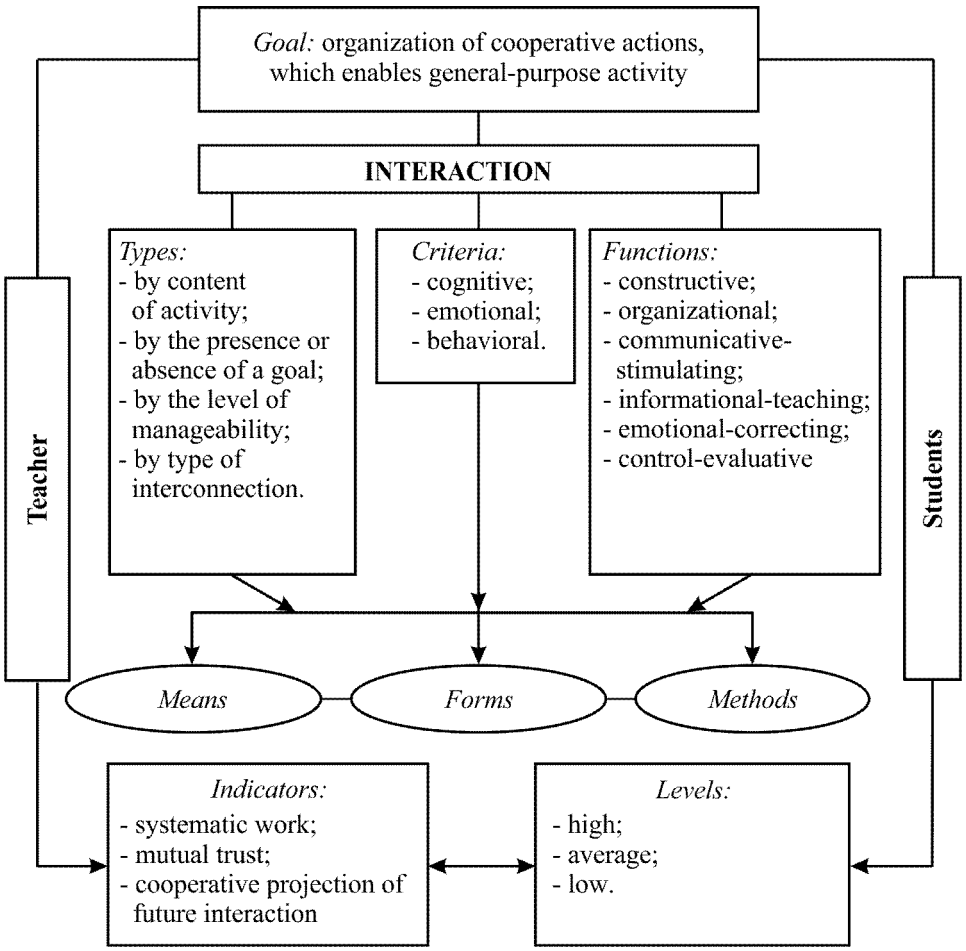

Figure 2. Structural and functional model of pedagogical interaction

The diagnostics was carried out in two groups of humanities students with identical performance levels. One group was designated as experimental, while the second one – as control.

The population for the research was the 122 students of ___ University. According the University's statistics, its demographics were as follows: total population of students

Group 1 (experimental) 58 students, including 28 female and 30 male.

Group 2 (control) 64 students, including 31 female and 33 male.

The matching age and gender characteristics of these groups, as well as their academic performance, ensured the comparability of these samples.

There are several assumptions regarding this study: The first is that everyone is motivated by something, recognizing this should trigger more emphasis on teacher-student interactions. Second, the researcher assumed that the data provided were accurate and reliable. The third assumption is that the questionnaires were completed with accuracy and sincerity and therefore, provided accurate and reliable data.

The obtained results are expressed in percentage and presented in Table 1.

Table 1. Development of interaction criteria in experimental and control group students (%)

Criterion	*Experimental group*			*Control group*		
	High index	Average index	Low index	High index	Average index	Low index
Cognitive	37.5	37.5	25	37.5	37.5	25
Emotional	25	12.5	62.5	12.5	12.5	75
Behavioural	15	50	35	37.5	12.5	50

The analysis of control group results found low indexes for all interaction criteria: cognitive, emotional, and behavioural. A low level of development of the cognitive criterion was found in 25% of respondents, of the emotional criterion – in 62.2%, of the behavioural criterion – in 35%.

The results of the experimental group also showed low indexes for all interaction criteria: cognitive, emotional, and behavioural. A low level of development of the cognitive criterion was found in 25% of respondents, of the emotional criterion – in 75%, of the behavioural criterion – in 50%.

Criterial tools that include the description of indexes for each interaction criterion were developed to determine the initial level of interaction organization (Table 2).

Three levels of teacher-student interaction were distinguished based on the developed criterial tools (Figure 3).

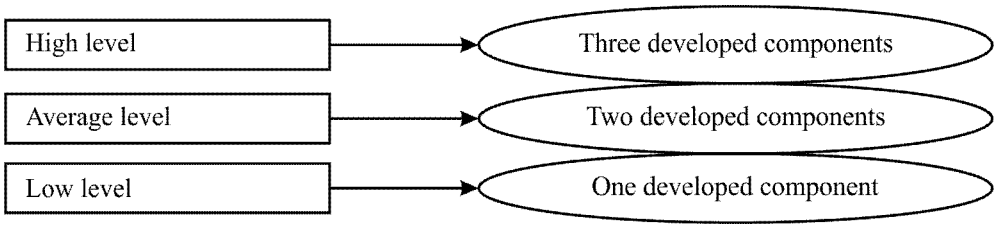

Figure 3. Levels of teacher-student interaction

Table 2. Qualitative characteristics of criteria, main indicators and levels that are the foundation for the determination of the teacher-student interaction capacities

Criterion	*Indicators*	*Levels*		
		high	average	low
Cognitive	– extension of the knowledge of oneself (as a personality and as a professional);	+	+	+
	– the ability to predict the results of work;	+	+	+
	– mutual trust;	+	+	+
	– comprehensive and profound knowledge of the psychological basics of pedagogical communication	+	+	-
	– the ability to overcome difficulties independently;	+	+	-
	– thorough planning of one's activity;	+	-	-
	– trust in the teacher;	+	-	-
	– importance of the teacher's assessment;	-	-	-
	– consideration of individual peculiarities;	+	-	-
	– knowledge of one's strengths and weaknesses.	-	--	--
Emotional	– sensitivity in communication;	+	+	+
	– positive attitude to the teacher;	+	+	+
	– trust in the teacher;	+	+	+
	– positive attitude of the teacher;	+	+	-
	– consideration of individual peculiarities by the teacher;	+	+	-
	– the desire to become like the teacher;	+	-	-
	– sufficient attention on the teacher's part;	+	-	-
	– teacher's understanding of the psychological state;	+	-	-
	– sense of the communicational partner's mood;	-	-	-
	– adequate evaluation of one's abilities and potential.	-	-	-
Behavioural	– projection of future interaction;	+	+	+
	– fair treatment of students;	+	+	+
	– importance of the teacher's opinion;	+	+	+
	– moderate exactingness on the teacher's part;	+	+	-
	– importance of the teacher's assessment;	+		
	– satisfaction with the cooperation with the teacher;	+	+	-
	– openness to innovation;	+	-	-
	– consolidation of one's self-concept in concrete situations of interaction and communication;	+	-	-
	– respect to the student's opinion;	-	-	-
	– collaboration relationship with the teacher	-	-	-

These levels were used to compile Table 3 that reflects the level of interaction criteria in the control and experimental groups.

Table 3. Levels of interaction in the experimental and control groups (%)

Group	*Level of interaction*		
	High	*Average*	*Low*
Experimental	12	50	38
Control	24	38	38

The qualitative analysis found that only 24% of control group students and 12% of experimental group students had results qualified as high level of interaction organization. The development emotional and behavioural components of interaction was also low. This predetermined the relatively poor result of the pedagogical interaction in general.

The investigation of the peculiarities of pedagogical interaction found a low level of adequate assessment of one's abilities and potential (emotional component); students did not have the required knowledge and skills to regulate interpersonal relations in education or project future interaction (behavioural component).

The obtained data allowed determining the conditions for improving pedagogical interaction, which were used in the educational process:

Resolution of learning situations during the teacher-student interaction

The model of a reproductive learning situation is an organizational system that is based on P. Ya. Galperin's concept of step-by-step development of mental actions. V. V. Dadydov's teaching system a specific variant of this model. It is based on the understanding of the formation of learning activity as the development of theoretical abstract to concrete thinking.

The category of cooperative productive activity of the teacher and students is an alternative to the above.

The situation of cooperative productive activity is regarded as a system. The first component is the teacher's personality – his or her attitude to him- or herself and to students' changes. The teacher not only bears certain information, but also helps to prepare students for interdisciplinary communications. The nature of administration and influence on the student changes; a collaboration and partnership attitude is consolidated. The student's position changes as well – from assimilation and reception of assessment to active interaction with the teacher and other students. The second component – changes in the ways of organizing the training of prospective teachers for professional activity. The learning process ceases being reproductive; it is reorganized in various forms of search activities as a productive creative process. The third component of reorganization is the focus on group learning, cooperative activity, various forms of influence, and interpersonal relationships and communication, as opposed to individual forms of learning.

A learning situation is an organized system of the learning process with the following components:

- organizational and operationalized content of the learning process, which determines the program of the activity learned by the students;
- procedures that organize the assimilation of the content and generalized methods of activity, as well as the transition from one level of development to another;
- system of interaction between the student and the teacher and between students; the dynamic of interconnection of all indicated variables during learning;
- procedures of monitoring and adjustment of learning interaction forms in accordance with the levels and stages of skill development; with that, interaction, relationships, and communication between the teacher and students always remains at the core of the learning process.

The solution of creative problems since the start of learning lays an objective foundation for the cooperation of all participants that are not yet capable of organizing this process independently while also providing for a significant status of self-regulation of the learned activity – the motivation of creative achievement. The encouraging functions of the creative problem is maintained throughout the learning process.

Organization of interaction by combining active teaching techniques

Active teaching techniques encourage students to engage in active thinking and practical activity when learning the material. Active teaching implies using a system of methods that primarily focuses on the students' independent learning of knowledge and skills during active cognitive and practical activity, as opposed to the presentation of ready information by the teacher, followed by memorization and reproduction of said information.

The point of active teaching techniques is to encourage students to engage in active thinking and practical activity, without which progress in learning is impossible.

Modern pedagogy includes numerous interactive approaches. The following ones may be distinguished: creative problems; work in small groups; teaching games (role-play, imitation, business games, and educational games); use of public resources (invitation of experts, excursions); social projects and other extracurricular teaching methods (social projects, contests, radio and newspapers, movies, plays, exhibitions, performances, songs, and fairytales); workout; study and consolidation of new materials (interactive lecture, work with visual material, video and audio materials, "the student as the teacher", everybody teaches everybody, mosaic (jigsaw), questions, Socratic dialog); discussion of complex and debatable issues and problems ("Take a Stand (Scale of Opinions)", PRES formula, projective techniques, "One – Two – All Together", "Change the Position", "Carousel", "TV Talk Show Discussion", debates, symposium); problem solution ("The Tree of Solutions", "Brainstorm", "Incident Analysis", "Negotiations and Mediation").

Focus of members of the pedagogical process on personal interaction

The central component of pedagogical activity is the personality-oriented interaction. It creates the best conditions for the development of learning and professional motivation, ensures partnership in learning, and creates conditions for the development of the personal potential of both students and the teacher.

Pedagogical interaction that is based on interpersonal communication parameters includes not only its objective conditions, but also the individual peculiarities of its participants.

When the learning process transitions to the level of personal interaction it transforms into cooperation of the teacher and students.

The teacher should have a clear idea of how personality-oriented education works. It is based on creating a special pedagogical situation that forces the student to prove him- or herself as a personality: to answer for one's words and actions, to make decisions, to act independently, to be internally free and full of creative initiative, to be the master of oneself, to choose the meaning and principles of life.

Personality orientation is not aimed at the student, but rather is generated by the student. The personal approach establishes a student as an active subject that

realizes his or her personal way of life and personal essence in the learning process and occupation.

Nowadays, the personality-oriented approach changes the perspective of priorities in occupational training. It not only teaches occupational knowledge, methods of action, standards and values, reveals certain personality traits, but also reveals the essential strength of a personality, its intellectual and moral potential, its ability to deal with complicated social and occupational situations, not only to operate with existing technologies, but also to engage in innovation and creativity (29).

The creation of favourable pedagogical conditions and specially organized systematic and targeted work helps to achieve significant shifts in the self-development of a prospective specialist's personality.

Coordinated roles of interacting persons

Active teaching forms increase the effectiveness of the learning process significantly. They focus the process on the collective and public discussion of problems, intensive interaction of students and teachers, and animated exchange of opinions between them. In addition, the learning process aims to develop a proper understanding of the content of the studied subject and its relation to practice, which ultimately creates and strengthens partnership relationships in the following systems: teacher-student; student-student; teacher-teacher.

There are various active forms, including business games, role-play, round-table discussions, brainstorms, and other types of discussions.

This study investigates a form of practical classes – a social and psychological training that uses the team teaching (TT) technique (Figure 4).

Team teaching is a class that is held by two teachers or a teacher and a student at the same time. Its main advantage is the addition of diversity and the improvement of effectiveness, since the teachers complement each other.

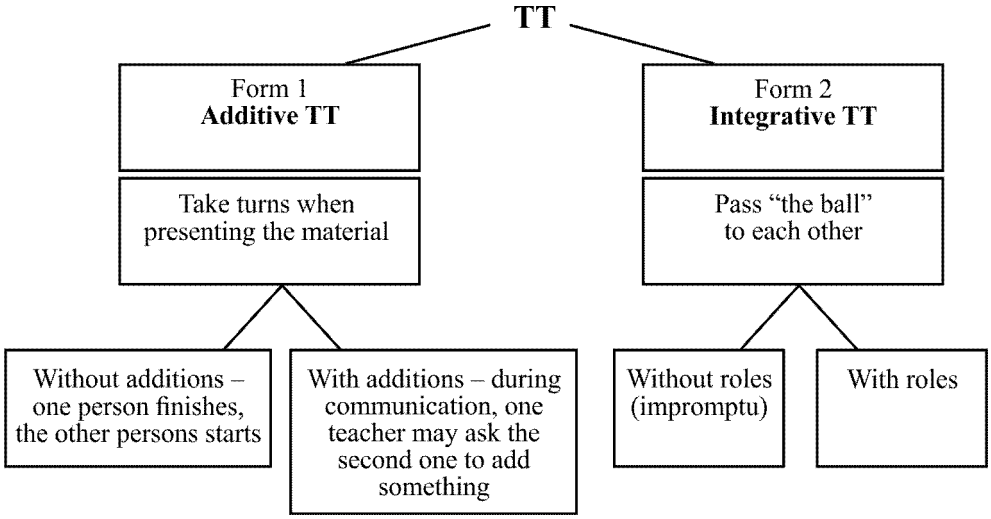

Figure 4. The forms of the team teaching (TT) technique

The most effective and efficient form of TT is the second one with role behaviour.

The creation of favourable pedagogical conditions helps to change the components of the pedagogical system, particularly the students as the subjects of effective interaction.

The reinvestigation results are given in Table 4 below.

Table 4. Levels of interaction in the experimental and control groups (%)

Group	*Level of interaction*					
	High		Average		Low	
	before	after	before	after	before	after
Experimental	12	37	50	63	38	-
Control	24	24	38	46	38	30

The table shows that the high level indicators in the experimental group grew by 25%, while the average level indicators grew by 13%. The low level indicators dropped by 38%.

Obtained results demonstrate changes in the distribution of students by levels of interaction. A positive dynamic was found in the experimental group.

Discussions and Conclusions

The literature analysis found that the enhancement of pedagogical influence on the self-development of a prospective specialist's personality is a relevant problem facing high schools.

The results of the theoretical analysis of psychological and pedagogical literature enabled giving an original definition of the term "interaction". Interaction is a process of mutual influence, the result whereof is a positive change in the characteristics of the pedagogical process subjects as elements of the pedagogical system.

Its components are presented in the structural and functional model.

The use of this model of pedagogical interaction helps to develop unity of the consciousness and behaviour, as reflected in the level of performance, which increased by 18% in the experimental group.

The conclusions of the study are as follows:

The pedagogical process is a bilateral interaction: the teacher on the one side and the student on the other side. The important goal of this process is to focus the personality of a prospective specialist on development.

The organization of pedagogical interaction in high schools should take into consideration the attitudes of students, while also providing them with ample opportunities for independent in-depth specialization based on academic programs.

A special investigation of pedagogical interaction allows high schools to plan an internal mechanism for guaranteeing the quality of education as a specially organized activity of pedagogical process subjects.

This research does not provide a final solution to the studied problem. The conclusion is that the main function of high schools is to develop a specialist's personality. This goal should determine the interaction between teachers and students. The pedagogical process may be humanistic only it implies a pedagogical interaction between the teacher and the student, in which both act as equal, to the extent of their knowledge and abilities, partners.

Implications and Recommendations

The offered "student-teacher" interaction model expands the criterial tools for assessing the level of interaction. It supplements the existing models and determines the conditions for improving pedagogical interaction in the educational process:

- Resolution of learning situations during the teacher-student interaction
- Organization of interaction by combining active teaching techniques that are related to professional activity
- Focus of members of the pedagogical process on personal interaction
- Coordinated roles of interacting persons.

This model helps the teacher to assist in the development of students' communication skills and to motivate them to study the subject. When investigating the "teacher-student" system, it is possible to conclude that in terms of communications, the student's personality does not require additional correction. The correction should be aimed at establishing the optimal level of interaction between students and teachers through the abovementioned teaching techniques. Such work with teachers may be in the form of a training or consultation, the main goal whereof is to discover the personality during communication, as well as to conduct and discuss exercises.

Disclosure statement

No potential conflict of interest was reported by the authors.

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