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**USING INTERACTIVE TECHNOLOGIES TO FOSTER ENGINEERING
PROFESSIONS STUDENTS' SOFT SKILLS**

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Abstract

The research is aimed at studying the efficiency of the interactive technologies using to foster engineering professions students' soft skills (exemplified by communicative competences). Hard skills and soft skills peculiarities and their role in the engineering education are studied and analyzed. Students are considered as the subjects of an educational process and the representatives of a new generation. Their peculiar features are found out and studied. Examples of using the interactive technologies in the educational process are given. The role of these technologies in the engineering professions students' soft skills fostering is studied and surveyed. First course students' (Southern Federal University, engineering professions) communicative competences are empirically studied. 264 students took part in the research carried out on the basis of psychodiagnostic methods ("The Interpersonal Diagnosis of Personality", Q-sort technique, "Communicative Competence Scale", "Thomas–Kilmann Conflict Mode Instrument"). Integrity of the tests results is proved by the φ^* and χ^2 statistic criteria. Using the interactive technologies in the educational process has a positive influence on the students' soft skills fostering: students' team working skills improved, their understanding of team working, making group decisions importance and team members motivation mechanisms enriched. Verbal and non-verbal communication, persuasion, public speaking skills, argumentation and rebuttal skills were improved as well. Students' creativity, activity in standing up for their standpoints, their being ready to meet challenges and to solve professional problems promptly increased. They learned to estimate their communicative competence, to respond to emerging conflict situations in a decisive way.

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Keywords: Group interaction, interactive technologies, soft skills, social and communicative competences, students-engineers.



1. Introduction

Nowadays Russia is oriented on industrial sector fast developing and its ability to activate the economic growth, its advancing to a new level of domestic and foreign economy. This strategy of the so called “New Industrialization” requires highly-educated engineering professionals. Modern specialists are to tackle the problems connected with fast economic development and advanced Economy establishment. First of all these requirements are addressed to engineers and young specialists – technical universities graduates.

The analysis of the requirements mentioned above showed that the so called “new type” engineers have to acquire appropriate modern technologies and to be able to foresee trends and emerging challenges in techniques and technologies development, i.e., to have an advanced creativity (Sigov & Sidorin, 2012). In conditions of modern technical standards (executive functions are delegated to modern computer-aided equipment) specialist is to be ready to adapt to changes easily and to improve communicative competence (Panthalookaran, 2018; Gashkova, Berezovskaya, & Shipunova, 2017). The reason is that in case of existing production facilities and manufacturing base upgrading, small-scale enterprises establishing, the role of an engineer grows more prominent: engineer is not just a technical performer of managerial decisions, he becomes a manager himself (a person having managerial, leadership skills, using material and non-financial methods of staff recognition). On the one hand, person gets these skills while practicing at work, on the other hand, they are developed in a process of professional training while studying at higher professional establishment.

In the light of modern tendencies of our human society economic and social development, the aim of higher education in Russia is to train and develop highly-skilled and qualified professionals, feeling competitive on a world labour market, ready for continuous professional growth, bringing the efficient and timely solutions to pending and non-standard issues and tasks under strict time constraints (Kibal’chenko, Eksakusto, & Istratova, 2017; Panthalookaran, 2018). The professionals are to be perfect in special competences (connected with professional activity) as well as in personal and social ones, helping them to adapt to any conditions, to meet the complicity challenges. That is why modern Federal standards pay special attention to the specialists’ soft skills formation on equal basis with the hard ones. Soft skills fostering is one of the leading aims in the modern higher educational establishments.

2. Problem Statement

So, the primary target of the modern education in general and teachers of the Institute of Computer Technologies and Information Safety (ICTIS) in Southern Federal University (SFedU) in particular, is developing the students’ professional and personal social and communicative competences. We need to follow complementary approaches to achieve this goal, i.e. to use the knowledge of hard and soft skills (their content, fostering and developing); to know peculiarities of the students as the subjects of the educational process as well as the representatives of a new generation; to use the innovative and interactive technologies and techniques as the key components of the educational process.

3. Research Questions

In the light of the mandated priority task we have analyzed the qualification requirements for modern engineering professions specialists that should be taken into account while forming the students' competences necessary for their professional development and success.

Russian scientists Sigov and Sidorin emphasized following requirements to engineers in modern conditions: "advanced creativity, knowing modern technologies (including informational ones), equipment; leadership and managerial skills; being able to use staff management, Psychology of management technologies; being competent in humanitarian, social, legal operations and economic activities, communicative technologies, business communication ethics; being ready for team working, corporate culture integration, self- and competence development in order to be competitive; being ready for reorientation with the aim of changing the spheres of activities" (Sigov & Sidorin, 2012, p. 83).

The competences going beyond the focused engineers training comprise a substantial part of the competences mentioned above. I.e., the specialists' soft skills fostering is of high importance for their professional success. This fact is reflected in the third generation of educational standards through highly developed social and psychological competences (social interaction, self-organization, etc.) required from universities graduates (Voilokova, 2011).

Students' soft skills in addition to professional (hard) ones fostering in a process of their professional training is accepted by Russian and foreign specialists (Voilokova, 2011; Lyz, & Opryshko, 2016; Ivonina, Chulanova, & Davletshina, 2017; Hartanto et al., 2017; Patacsil, & Tablatin, 2017; Takacs & Horvath, 2017; Botke et al., 2018). Hard skills are technical attainments that may be displayed and measured; they are considered as the ability to undertake certain tasks. Hard skills are connected with the person's professional activity and qualification; e.g. the following hard skills are leading ones for engineers: working with technical documents, detailed drawings, special programs for constructing details and mechanisms, etc.

Hard skills are the basic ones for specialists; but soft skills (skills of the 21st century, social and psychological competences) are of utmost importance. Content analysis of the "soft skills" notion allows defining it as "the body of the specialists' social and psychological knowledge, experience, skills and motivation characteristics in the sphere of interaction; ability to manage their time, their power of suggestion, leadership skills, emotional intellect, conduct negotiations, etc." (Ivonina, Chulanova, & Davletshina, 2017).

The research shows the growing need for professionals using their soft skills to advance to the next level in their career; they are to begin using them while studying at universities (Ramkumar, & Rajini, 2018), because different data show that the personal success is 85% dependent on soft skills and only 15% on hard ones (Ivonina, Chulanova, & Davletshina, 2017).

Four basic soft skills types are defined in our research: basic communication, power of suggestion and argumentation; leadership skills and team work (Shipilov, 2016). Creativity, operational thinking, cognitive flexibility, social intelligence, etc., are also of great importance.

Soft skills fostering is of immediate interest for engineering professions students. These skills formation is to begin while students studying at universities. Even the students themselves note the

necessity and importance of the soft skills developing for their future professional success (Schipper & Van Der Stappen, 2018).

Researchers put an emphasis on fostering and developing the students' social competences. In this case we need new methods of information delivery and subject matter retention. This is mostly due to the students' psychological features and their information (including teaching one) perception peculiarities.

Nowadays the classical notion of studentship (the most difficult period of the students' intelligence structuring; cognitive motivation, independence, social activity and maturity development; need for self-cognition, self-development and self-organization) changes and takes on new forms (Gladkaya, 2012).

According to Strauss-Howe generational theory modern students are the representatives of the Y generation (Strauss, 1997). As the time passed, we would mention that nowadays modern students represent the Z generation. Their system of values includes optimism, confidence, prompt rewards, gains, good knowledge of technics and informational technologies, learning on the fly, etc. (Karpushkina, Lyasina, YuDyakonova, & Sokolov, 2014).

At the same time the students can be characterized by being naive, passive, immature, having consumer way of life; they are not ready to take risks and obligations connected with adulthood. Young people want to get high salary for their just being at work, but not for the quality of their work results. They are not interested in working in a sphere of manufacturing industry because it requires a great deal of effort, self-organization and discipline.

The so called "fast result" orientation leads to specialists refusing routine work and activities, including their studying process, if it is organized without taking into account those ways that the students use for information getting, processing and uptaking. It should be acknowledged that the students are apt to perceive visual images in contrast with their teachers who are inclined to verbalization. They are not able to understand and process huge amount of information (e.g., academic lectures) without its visualizing. So, the new information is to be taught in a sketchy, brief, exciting way (Karpushkina et al., 2014; Semenovskikh, 2015). This type of information processing is called "mosaic thinking".

Internet (but not direct or past generations' experience) is used as the basic source of information in the modern world; that is why the students (including students-engineers working with technical equipment) replace live communication by virtual one, and have problems with team activity, cooperation and resolving conflicts (Aladyshkin, Kulik, Michurin, & Anosova, 2017; Bylieva, Lobatyuk, & Rubtsova, 2018).

They are characterized by clear self-absorption and the lack of interest to people around them. They perceive reality through computer games and the absence of games in studying process reduces their motivation. Students (especially first year ones) are not self-sufficient while information searching, most of them are up against self-organization: they are unable to organize their spare time, to plan their activity, have no motivation and weak self-regulatory mechanisms.

Consequently, nowadays students' peculiarities are practically problematic and indicate their soft skills being poorly developed. That is why we need to organize the educational process in the way to develop soft skills.

World and Russian scientists' experience shows that using the interactive technologies in the educational process improves students' personal development as well as soft skills fostering (Hennessy,

Dragovic & Warwick, 2018). The most important aim is to develop students' communicative competence. That is why it is significant to practice as well as to learn theoretical basis. It helps to uptake the information in use (Tenkhunen & Yeliseeva, 2015), to practice it in real-life situations, occurring in the engineer professional activity. Supplementing traditional academic lectures at universities with the new forms of teaching (such as visualization, conference), helps to boost students' cognitive activity and to stimulate their independence. (Bekirova & Rykov, 2010) Students' team work (working on a draft, problem, task, making group decision) is on the front burner nowadays. Team working ability included in the soft skills is of high importance for the students' future success achieving. The researchers from the University of Nebraska (Lincoln, United States) defined seven characteristics necessary for team work efficiency: productive conflict resolution, mature communication, role clarity, accountable interdependence, goal clarity, common purpose psychological safety. (Adams, Simon Vena, & Ruiz-Ulloa, 2002).

Special (interactive and communicative) technologies such as project method (Koch et al., 2017; Adams, Simon Vena, & Ruiz-Ulloa, 2002), life events game simulation (Panthalookaran, 2018), interactive methods using computer technologies (De Anna et al., 2014) are applied during the educational process taking into account the necessity of soft skills development and nowadays students' peculiarities. First of all these technologies are dynamic, effective (from the point of view of the students being involved into the process of learning) and motivational (generate students-engineers' interests in communicative processes, interaction, uptaking humanitarian subjects information). Secondly, these technologies are characterized by shifting away from teachers' monologues and students being just the objects of information receiving. Thirdly, communicative and the interactive technologies increase the visibility of humanitarian information and facilitate its perception and processing, which is of great importance for the engineering professions students. Finally, the interactive technologies generate knowledge through reflexive position and experience developing; they help to deal with fear of giving wrong answer because most of the methods are based on finding decisions and answers during group discussions instead of overlearning information.

4. Purpose of the Study

As has been shown above, soft skills connected with social and personal competence are indispensable for persons' career and competitive ability development (Ramkumar & Rajini, 2018).

Thus, the purpose of the research is to study the interactive technologies efficiency in the engineering professions students' soft skills (exemplified by communicative competences) fostering. Such students' characteristics as interpersonal relations prevailing type, communication maturity estimation, sociability, independence, ability to work as a team, espouse personal point of view and to mitigate conflict situations are the subjects of our study. We assumed that using the interactive technologies in the educational process of engineering professions students may effect on their skills developing, making them socially and communicatively successful and good at their professions.

5. Research Methods

Such interactive educational technologies as quests, case-study, brainstorm, business role-playing games, training technologies were used in the research in order to achieve the set goal. Special

psychodiagnostic methods and techniques were used with the aim to analyze students' communicative abilities while studying. E.g., "The Interpersonal Diagnosis of Personality" used to find students' interpersonal relations dominating types on the basis of two scales (dominance – submission, friendliness – aggressiveness) and their degree (adaptive – maladaptive); William Stephenson's Q-sort technique aimed at inspecting peoples' self-perception on the basis of analyzing person's six behavioral tendencies while working in a team (dependence – independence, sociability – unsociability, struggle acceptance – non-acceptance); drawing technique "Communicative competence scale" (modified by T. Eksakusto) apt to study persons' self-esteem from the point of view of personal communicative skills and abilities (we offer a person a sheet of paper and ask him/her to draw a staircase with 10 stairs (first stair means persons' inability to communicate, making and keeping contacts while tenth upper stair means person's communicative maturity, ability to perceive and understand others in a correct and exact way, to find the way out of difficult conflict situations, etc.) and his/her position on the staircase; Thomas–Kilmann Conflict Mode Instrument (TKI) is based on surface model (paying attention to other people's interests – ignoring or protecting them) and is used to analyze person's behaviour in conflict situations.

264 (80 ladies and 184 young men) first year students (Bachelor's and Graduate's degrees, full-time tuition, 19-22 years old) of Southern Federal University (Russian Federation) studying at engineering professions faculties took part in the research.

The research was held in 2017-2018 academic year. All students took part in the research on a voluntary basis. The data of the research were received on the basis of the following variables: interpersonal relations dominating types, persons' behaviour while team working (Q-sort technique), communicative maturity and abilities self-estimation (Communicative competence scale), types of behaviour in conflict situations (Thomas–Kilmann Conflict Mode Instrument).

6. Findings

The analysis of the students' communicative competence testing shows that 84% of them are characterized by being communicatively open, ready to have emotional links with their team members as well as with others (average value in the group was 14 points which means that the "sociability" is highly developed). 16% of the students showed the reserved demeanor. This result reflects peculiar features of the current generation focused on establishing the extensive interpersonal relations system in social nets. At the same time, these students estimate their communicative maturity on a very high level (7,2 points of 10). Nearly 86% consider their communicative abilities being well developed (7-10 points), which is an overestimation. Speaking about their communicative virtues (abilities), the students point out their being tolerant, kind, interested in the partners in conversation; being able to listen to their partners carefully, being able to find common ground with others. Such characteristics as sensitiveness, overdependence, inability to start off/get in touch with the partner in real (not virtual) conversation, lack of "practicing" in communication, failing to defend own point of view effectively, are supposed to be challenges and negative sides of communication from the point of view of the students. However, more than half of the students (54%) tend to be dependent, i.e. to accept group norms, standards, ethical and moral values, to be passive, compliant, and automatically obedient. These students are also characterized by avoidance of struggling (58%), i.e. they try to escape from active communication, remain neutral in group arguments and disputes,

and accept a compromise which may be an approval of their being passive in group relations. Therefore most of the students choose the strategy of accepting a compromise, reciprocal concession (85% of the students have satisfactorily high points in this scale). The results of the tests conform the students' commentaries concerning their communicative maturity: most of them consider their trying to avoid conflicts, to find compromises being their positive traits. The second strategy preferred by the students in conflict situations is the strategy of adjustment, i.e. refusing own ideas and interests on behalf of the partner's ones. More than half of the students (75% of them showed average and high points in the scale) are passive and have no aspiration to defend their point of view. Third strategy (73% of average and high points) in the students interacting is avoidance, i.e. having no aspiration to gain their goals. These strategies are fully consistent with the students tending to avoid struggling in communication which is, on the one hand, the sign of their being passive in interacting with others, but on the other hand, it shows their being incompetent in argumentation and rebuttal, assertive debates, incapable to understand and accept their partners correctly, etc.

Our research shows that the Responsible-Hypernormal type of interpersonal relations (if $\chi^2_{emp} = 687.5$, $\chi^2_{cr} = 468$, $p \leq 0,01$) (Fig. 01) predominates over the other ones. This type is revealed through the students tending to idealize interpersonal relations, to being sociable, kind and keen to make others being positively impressed by them. 38% of the students showed overexpression (extreme level and extreme level with the tendency to social maladaptation) of the abovementioned type of relations. That means that they have a problem of suppressed (or repressed) hostility which causes psychological pressure on persons, their being "blocked" (pression, limited patterns). One more type of interpersonal relations prevailing among the students is Managerial-Autocratic one (average value 7,6 points; $\chi^2_{emp} = 634.9$, $\chi^2_{cr} = 468$, $p \leq 0,01$) (Fig. 01). It is characterized by the students being extraverts, optimistic, trying to be leaders, bend others to their will, being able to make decisions easily and fast (actions and ideas utterance go before their reasoning). Thus, 31% of these students have an extreme level of power-leading type of interpersonal relations (as well as an extreme level with the tendency to social maladaptation).

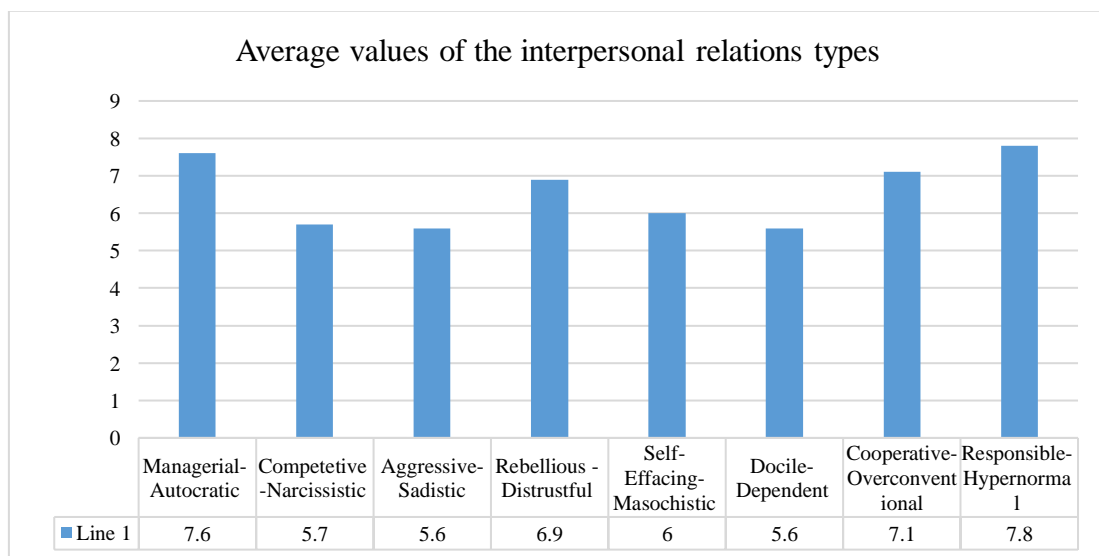


Figure 01. Types of the engineering professions students' interpersonal relations

The research helped us to find out that 8% of the engineering professions students tend to isolate themselves, defend themselves against the world; have neither desire nor ability to get in contact with others; have no need of communication and show emotional resignation in interacting. In other words, the engineering professions students have challenges in communication and interaction because their personal and communicative skills and abilities are not developed well. This fact constrains the students' soft skills fostering and indicates the necessity of the interactive technologies using.

Interactive educational methods include life situations modelling, team solving problems, etc. The aim of such interactive education is to attract all the students to the cognitive process and to let them understand and realize their feelings, emotions, behavioral strategies and patterns as well as simulated situational conditions.

Now let us give an overview of the interactive technologies and techniques used in the educational process (Southern Federal University, ICTIS) of the engineering professions students:

Quest – is one of the modern technologies used in the educational process. First of all, quest is a game-adventure including teams members meeting challenges and solving different problems to reach some peculiar goal. Our teachers use quest in practicing. We use a linear quest as usual. It is composed of situations given by the teacher and specified by peculiar space. The aim of these quests is to fulfill the task or to find something; the tasks are to be solved one by one. We use different kinds of quests in the educational process, one of them is held in the first lesson. The first quest is to prepare the basis for future team working, shorten the emotional distance between the students and to relieve their stress; to build confidence and to develop (through team working) psychological cohesion between them. Each team has to carry out several tasks (same for each team) in a time allotted, e.g. to get an autograph of the teacher working at University, to sing a song about the team, to find a bank note or coin, to find three unusual things and to prove their being unique, to find the used ticket in any means of transport, etc. These tasks are regulated by strict rules: the members of the team are to be close to each other (the distance between them is to be not more than 1 meter) while fulfilling the tasks, each minute of delay in fulfilling the task impose penalties by points deducting. As a result the quests activate the students' abilities and motivate them to study; help the students to realize all benefits and implications of team work and interaction, to reflect their individual peculiarities, i.e. to develop leadership (to lead and not to be led) skills as well as reasoning ones, ability to manage their time, etc. At first, the students are commonly passive and unsociable, but these kinds of quests help them to understand the necessity of their being active and sociable while solving problems and fulfilling the tasks. Some of the students express their feelings in the following way: "I understood that the task can be fulfilled in a different or better way, but no one listened to me...", or "I have to learn to drive others home to me, unfortunately, I have no power of persuasion...".

Business role-playing games. This kind of the interactive technologies is based on real social situation modelling helping the students to develop their team work skills and to interact while making group decisions. The example of the business game (used in our university) is a software program project developing. This software project program should be popular with peculiar consumers. The aim of the game is to create an attractive software program project, to describe its purpose and content. In view of this each team is to prepare an elevator pitch, describing all positive characteristics of their program to attract prospective investors and consumers. Each team is divided into two or three groups. They have one and

half hours to fulfill the task. Teacher reminds the students that first of all they are to allocate all functional responsibilities (coordinator, program builders, testing group, PR-group) in their team. The members of some groups “cast parts” before discussing their project while other teams members began discussing the projects and came to a conclusion that all the responsibilities were allocated naturally during their work (as a rule the second team type is more effective and successful in reaching the goals; the members of these teams realized the importance of the accepted responsibilities from the point of view of their professional and personal success). At the end of the game, the teams are to prepare a presentation of their project using elevator pitch. Preparing elevator pitch (taking into account its merciless terms and rules) poses a significant challenge to the engineering professions students: they have to describe all the advantages of their software product over the competitors’ ones during limited time; to cause desire to make investments in their project as well as to attract the potential consumer to buy their product. The results of the business role-playing games are as follows: intensive communicative connections between the members of the team developing; public speaking skills, creativity forming; developing the ability to work in a team efficiently even in conditions of interests conflicts, students being ready to solve serious professional problems within a short time.

Brainstorm is a method of a problem solving based on creativity and creative activity stimulating. The members of the teams are offered to give as many ideas for problems solving as they can, and then the most useful ones are selected. We use different tasks for brainstorms in our practice, beginning with comic tasks continuing with professional and organizational ones (e.g., “you are the head of the well-known IT company, your company has to fulfill the project by the indicated date, but you understand that it is almost impossible. The analysis of a situation in your enterprise has shown that the employees often make periodic breaks for smoking/online-games /social networks, etc. (only one criterion is chosen). Your task is to fix this problem (using minimum investments) and to make your employees to implement the project in time. What are your actions?”). As a rule, students try to use traditional ways of this problem solving: material incentives/penalties, non-financial penalties system, using cameras for inspection. However, later different and uncommon ideas on the task solution are set forth: to organize time-management trainings for the employees, to use the so called “puzzle-reports” at the end of the working day (each employee is to make a personal report and put it into a big puzzle-picture; those employees who are unable to manage it, are responsible for the general puzzle-report submitting failure), etc. As a result, the students realize the efficiency of making group decisions, understand their personal roles in the course of putting forward the ideas (facilitator, critic, integrator, organizer, creator, etc.).

Case-study is based on analyzing specific situations with the set conditions. The students are to be divided into several teams (5-6 persons in each team). Each team is given a case and 60 minutes to analyze it and discuss the challenges connected with this case. When the time is up, each team is to give their role-play solutions of the case. As a rule, the situations used in the educational process, cover main problems of the teams members interaction. So, the situations connected with analyzing the conflict-ridden relationships are rather topical for future engineers, e.g., “Two subordinate employees (or colleagues) had a conflict and cannot work together efficiently anymore. Each of them asked you personally to solve the problem and to uphold their personal positions. Your task is to choose the correct solution and to substantiate your behaviour and point of view”. Thanks to the cases solving the students learn to identify the intra-group

communication problems, to find optimal solutions of the tasks connected with social interaction; to use effective technologies of verbal and nonverbal communication; to obtain persuasion, argumentation and rebuttal skills and competences.

While analyzing the results of the abovementioned interactive technologies using, we came to a conclusion that they have a positive influence on the students' soft skills fostering and development. First of all, the students learn to work in a team and to interact with other members of the team; it is usually expressed in high speed of tasks fulfilling, well-managed responsibilities allocation between the team members as well as in the so called "inverse relationships" at the end of semester. The students were offered to answer the question: "Is it possible to say that you have acquired practical knowledge and skills in communication and interaction management?", they answered as follows: "Yes, I have learned the ropes of managing a team and interacting with others", or "I have become self-confident, gained a great deal in self-motivation for further development", "yes, of course, now I have the necessary skills in making group decisions", "... I know how to find common ground and foster dialogue with people as well as to resolve conflict situations", "... I am able to work in team", etc.

Secondly, a reliable change in a percentage ratio of the students choosing various strategies of interaction in conflict situations is revealed: the number of students choosing the strategy of adaptation ($\varphi^*_{emp} = 2.7$, $\varphi^*_{cr} = 2.31$, $p \leq 0,01$) and avoiding ($\varphi^*_{emp} = 2.1$, $\varphi^*_{cr} = 1.64$, $p \leq 0,05$) decreased. Respectively, the number of students choosing the strategy of cooperation to resolve conflict situations ($\varphi^*_{emp} = 2.16$, $\varphi^*_{cr} = 1.64$, $p \leq 0,05$) increased (up to 68%). It is possible to conclude that the students learned to find the alternative ways of interacting in difficult situations, which completely satisfy the interests of both parties; they became active and showed inclusion in social interaction, learned to defend their points of view.

Thirdly, the tendencies in changing some interpersonal relations prevailing types are found during our research. The number of students choosing Cooperative-Overconventional interpersonal relations type (i.e. the tendency to collaborate, cooperate, being flexible while solving problems through communicating, being initiative in achieving the purposes of the team ($\varphi^*_{emp} = 1.74$, $\varphi^*_{cr} = 1.64$, $p \leq 0,05$) increased. Reliable differences in interpersonal relations prevailing types magnitude and its changing were not found; this might be explained by the relatively short period (one semester) of working with the students; but personality traits change gradually and rather slowly.

Significant differences in the students estimating their own communicative skills were not found, however, the changes in percentage ratio were revealed. So, the average frequency in groups shows that the students still value their communicative competences highly (7,5 points), however, the number of students estimating their communicative skills at a low rate (from 2 to 4 points: $\varphi^*_{emp} = 2.08$, $\varphi^*_{cr} = 1.64$, at $p \leq 0,05$) as well as at a very high rate (9-10 points: $\varphi^*_{emp} = 2.318$, $\varphi^*_{cr} = 2.31$, $p \leq 0,01$) authentically decreased. These data allow speaking about the tendency to the students adequate estimating their communicative abilities.

7. Conclusion

The research was aimed at the students-engineers' soft skills fostering. Interactive technologies were used with this purpose in the educational process. The interactive educational technologies using was

analyzed taking into account nowadays students' peculiarities and new requirements for students-engineers training; the efficiency of using the technologies mentioned above while teaching first-year students (Bachelor's and Graduate's degrees) of engineering professions in SFedU was considered. The results of the research show the following changes, proving that the students' soft skills began being fostered:

- the students realized the team/group interaction peculiarities: the necessity of team/group processes managing; team-building characteristic aspects; peculiarities of interacting in case of clash of interests; they understood the efficiency of group decisions making, the mechanisms of team/group members motivation; specific aspects of solving the problems connected with the social interaction;

- creativity, the skills of using verbal and non-verbal communications technologies developing; forming such skills as public speaking, argumentation/rebuttal, persuasion, establishing and maintaining contacts with others, being ready to solve serious professional problems within a short time, to cooperate with other people; being active in defending own points of view;

- reflection of personal peculiarities: the level of communicative maturity, leadership or executors skills expression; assuming group roles and functional responsibilities; realizing the personal role in ideas putting forward;

- intensive communicative connections developing in teams/groups, psychological cohesion between the teams/groups/ members through working well in harmony together.

The abovementioned changes show the extra efficiency of using the interactive technologies in the students-engineers educational program.

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