

Training Future Teachers to Develop Conscious Self-Regulation of Voluntary Activities

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Abstract – One of the most important psychological factors of efficient educational process is the ability of the teacher to consciously regulate their voluntary activities: for instance, their behaviour, their communication etc. In this respect, developing this kind of skill in students (teachers-to-be) during their university course appears to be of vital importance. The present paper is aimed at sharing the results obtained within the framework of the conducted experiment. The main objective of the latter was to implement the programme of training future teachers to develop their conscious self-regulation of voluntary activities. The theoretical approaches used in the research were the analysis of other psychological and educational surveys on the subject under study, induction, deduction and modelling. Observation, testing and educational experiment were used as empirical approaches to the survey. The major technique used in the research was "The Style of Behaviour Self-Regulation (SBSR)" designed by V.I. Morosanova. While processing the information concerning the results of the survey we used techniques of quantitative and qualitative data analysis. Mathematical and statistical data processing was performed by means of "SPSS Statistics 17.0" service pack.

Keywords – training, self-regulation, activity self-regulation, teachers-to-be.

I. INTRODUCTION

The contemporary society makes specific demands on teachers and educators. The high quality of their education and professionalism, their inner values and communicative culture now seem to be of vital importance. Nowadays the demand for teachers capable of efficient planning, arranging and controlling

the process of education, as well as capable of adjusting and correcting it promptly, is extremely high.

Conscious self-regulation of voluntary activities is a feature of any sphere of an individual's life (educational, professional, creative), a meaningful attribute of interpersonal interaction in teaching and learning. Teaching activities are characterized by a high level of psychic strain. Therefore, a good amount of social activities and stress resistance are considered necessary for educators.

The research conducted by V.I. Morosanova and her team has proved the fact that a steady capability of self-regulation prevents the occurrence of the above-mentioned negative phenomena. Psychic self-regulation makes it possible for an individual to mobilize inner sources to cope with the challenges appearing in the professional sphere.

Conscious self-regulation of a person's behaviour and activities is inseparably connected with self-consciousness. According to Morosanova, developing self-regulation facilitates growth of positive forms of self-consciousness and reinforces their regulating role in human behaviour [1, 2]. The development of the regulating function of self-consciousness is performed during the university course. University education implies a high degree of students' freedom in arranging their own learning activities. Studying at university creates certain grounds and social environment for students to develop their personal agency.

It follows from what has been said above that the challenge to develop conscious self-regulation of voluntary activities in teachers-to-be is currently timely.

Our immediate aim is confined to the investigation and description of the peculiarities of students' self-regulation in their activities. Alongside with this objective our intention is to design and implement the programme of training future teachers to develop their conscious self-regulation of voluntary activities. The final purpose of our research is to determine the efficiency of the designed programme.

The object of our exploration is teachers' professional training and developing their conscious self-regulation of voluntary activities.

The subject under study is the bulk of psychological and educational conditions determining the efficiency of developing conscious self-regulation of voluntary activities in future teachers.

Survey objectives:

1. To analyze psychological surveys aimed to investigate conscious self-regulation of voluntary activities.
2. To determine and describe the peculiarities of developing conscious self-regulation of voluntary activities.
3. To design and implement the programme of training future teachers to develop their conscious self-regulation of voluntary activities.

The working hypothesis of the survey: training future teachers to develop conscious self-regulation of voluntary activities will be successful if there is a specially designed training programme based on the principles of integrity, activity, optimism and individual approach to learners.

Empirical study base: Shuya Branch of Ivanovo State University, 132 students (future schoolteachers).

Scientific novelty:

- We have come to a conclusion that the most developed component of the individual system of conscious self-regulation is decision-making programming. The major difficulty that students face is the analysis of the exterior and interior conditions that are important for achieving the goals set by learners.
- According to the conducted survey, the students with a higher level of conscious self-regulation are more capable of goal-setting, decision-making and planning their own activities. On the contrary, the students with a low level of conscious self-regulation have shown a less-developed ability to set their goals, as well as to model the conditions important for achieving them.
- We have designed and implemented the programme of training future teachers to develop their conscious self-regulation of voluntary activities.
- We have determined the psychological and educational conditions facilitating the efficiency of developing conscious self-regulation of voluntary activities.

II. LITERATURE REVIEW

The phenomenon of conscious self-regulation of voluntary activities has been extensively researched in recent decades. Among the surveys addressed to its investigation are the works on the functional structure of self-regulation processes (O.A. Konopkin [3], V.I. Morosanova [1, 4, 5], I.N. Bondarenko [6]; Carver C.S. Scheier M.F. [7]; the research of students' regulatory processes (E.V. Kryazheva, A.E. Tsymbalyuk [8] and others.); the research of self-regulation in various types of professional, educational and professional activities, the research on the role of self-regulation in the process of professional students' self-determination (A.K. Osnitsky [9, 10], A.O. Prokhorov [11], etc.) the research delivered the framework of the differential approach to conscious self-regulation of voluntary activities (V.I. Morosanova [4, 5], E. A. Aronov [2], E. M. Konoz [12], I. A. Plakhotnikov [13], T. G. Fomin [4, 14]), etc.

Conscious self-regulation of behavior and activity is considered in the scientific psychological literature as a process unfolding in time. It consists of several intertwined components (units). A construct developed by a scientific school under the direction of O.A. Konopkin received wide publicity. It included the following components: 1) the objective of the activity adopted by the subject, 2) the subjective model of significant conditions, 3) the executive action programme, 4) the system of subjective criteria for achieving the goal, 5) monitoring and evaluation of actual results, 6) the decision on the correction of the self-regulation system [3, 15]. It has been found out that the interrelationships between these components are complex. Such activities constitute the implementation of a certain programme, defined by a goal that regulates these activities.

Considering the self-regulate capacity as a criterion for the personal agency, O.A. Konopkin writes, «Personal agency manifests itself principally in self-determination, in self-organization and management, i.e. essentially in the conscious self-regulation of its activities in all its substantive and structural aspects».

In V.I. Morosanova's works, the concept of "individual system of conscious self-regulation of voluntary activities" is widely used, and it includes development indicators of regulatory processes such as planning, modeling, programming, evaluating and correcting the results of their activities [1, 2, 4, 5, 12, 14]. According to the author's opinion, the development in the individual style of self-regulation is determined by typological personality characteristics. They create the basis for the prevailing functional activity of certain regulatory units [1, 5].

The current analysis of the problem has allowed us to determine the component structure, the styles, the principles and mechanisms of behavior and activity in the framework of self-regulation, as well as its specific features and structure in representatives of various professions (and at different professional stages). The current survey has helped to discover diverse interrelations between the conscious self-regulation of voluntary activities and individual psychological qualities of a person (self-consciousness; anxiety; the structure of motivation, attitudes and values; evaluating own capabilities of determining activity purposes; probability of doing tasks properly; ability to

analyze work results and to identify reasons for success and failure, etc.). The research overview shows that at present time the ways and means of effective developing conscious self-regulation of voluntary activities in teachers-to-be during their university course are in particular need of disclosure.

III. MATERIALS AND METHODS

Exactly 106 students doing their first year in pedagogical training took part in our empirical research with the aim of identifying the level of their self-regulation ability [16]. Taking into account the results we received, we have designed the programme of psychological and pedagogical training and support of future teachers for them to develop a certain level of self-regulation in their voluntary activities. In order to test the experimental programme and determine its efficiency, we arranged and conducted a psychological and pedagogical experiment. For this purpose, we randomly chose 13 students as the experimental group (EG) and 13 students as the control group (CG) among the first-year students. Thus, the number of future teachers participating in the research is equal to 132. In order to balance the influence of the side variables, the EG and the CG were formed of two academic student groups enrolled in the pedagogical areas of training. Students of the EG participated in the implementation of the experimental programme while those from the CG took part only in the initial and final testing.

To check the hypothesis developed and the solutions of the problem, we used the following set of methods:

- theoretical (the analysis of other psychological and educational surveys on the subject of examination, induction, deduction and modelling);
- empirical (approaches of observation, testing and educational experiment);

methods of quantitative processing of the research results (methods of primary statistical processing of the research results, calculating the values of the Pearson Chi-square test of goodness, Mann-Whitney U-test, Wilcoxon T-test) and qualitative data analysis (differentiation of material into groups, comparison, contrasting). Mathematical and statistical data processing was performed by means of "SPSS Statistics 17.0" service pack.

Research techniques. The major technique to study self-regulation properties of future teachers used in the research was "The Style of Behavior Self-Regulation (SBSR)" designed by V.I. Morosanova. The statements of the form are based on typical real-life situations and do not have a direct correlation with the specificity of professional or educational activities. This method allows to identify and evaluate the overall level of self-regulation development and the level of development in private regulatory processes (setting activity goals, modelling the conditions important for achieving the goal, decision-making programming, monitoring, evaluating and correcting their activity) and personal properties (facility, inner-directedness).

IV. EXPERIMENTAL PROGRAM

Taking into account the results of the initial examination survey, we developed and tried out the programme of training future teachers to develop their conscious self-regulation of voluntary activities based on the analysis of scientific and methodological literature and available hands-on experience with students.

The main objective of the programme is the future teachers' development of conscious self-regulation of voluntary activities.

Programme objectives:

- development of students' knowledge about conscious self-regulation of voluntary activities as a system of internally-organized processes that is meant to promote their initiative, their ability to direct, maintain and manage their own energy in various types of activity;
- determining and creating psychological and pedagogical conditions for students to develop high level of conscious self-regulation;
- raising students' motivation and demand for self-development and achieving the socially meaningful results.

Approaches and deductive methods of the programme implementation are conversation, practice, monitoring (and inner monitoring), teamwork, active teaching methods (training, discussions, role-playing games).

Future teachers' psychological and pedagogical support and training to develop their conscious self-regulation of voluntary activities provided for the exposure and creation of peculiar psychological and pedagogical conditions for its realization. These conditions are as follows:

- improving the university's educational environment to facilitate the development of future teachers' conscious self-regulation of voluntary activities;
- enriching students' knowledge about the process of conscious self-regulation and its components, as well as about the skills facilitating and improving this process;
- facilitating and promoting interaction between all the participants of the educational process;
- promoting success in academic performance;
- monitoring the development of the future teachers' conscious self-regulation of voluntary activities.

Students of the experimental group (EG) took part in the implementation of the experimental programme that was carried out during the psychological and pedagogical experiment. Students of the control group (CG) participated only in the initial and final testing. The comparative analysis of the data obtained through testing the IG and the CG that was arranged before the educational experiment revealed the absence of statistically significant differences between these groups in the overall level of conscious self-regulation. The

comparative analysis was carried out using the Mann-Whitney U-test ($U=67.5$).

The designed programme was implemented in accordance with the specific features of the educational institution and implied weekly work with students during the first semester while teaching the academic discipline "The Fundamentals of Metrology, Standardization and Certification". The programme was as well functioning during extracurricular activities. The academic value of the discipline "The Fundamentals of Metrology, Standardization and Certification" is 4 credits. The curriculum includes actual teaching and learning in classrooms as well as students' individual work. Individual work, teamwork and frontal work were the forms most used in teaching.

While teaching this academic discipline, we paid much attention to the importance of all educational aspects for the professional development and personal growth of future teachers including their motivation to study and get involved in all educational activities that the programme implied. The students had lectures, practical classes and laboratory work. We took effort to establish all the conditions to promote and facilitate students' interaction, self-disclosure, mutual responsibility and reflection. The pedagogical situations focused on the development of conscious self-regulations were deliberately simulated in the process of teaching this academic discipline.

While teaching the discipline we used visualized educational aids for presentation to students, took advantage of various electronic educational resources taking into account the connection of visual thinking with the creative decision-making process revealed in a number of research. We also took into consideration the regulatory role of the person in the activities that he or she is performing. Such techniques as case-study, using clarifying questions, discussion of report, contributed to the activation of individual creative thinking of students at seminars and workshops.

Students' individual work facilitated the development of the capacity for the conscious regulation of learning activities (independent reading, taking notes from original sources, solving problems, self-testing, preparing reports for seminars for further discussion, etc.).

Students' individual research work was promoting the development of their professional competences and creativity. It included writing research papers, drafting reports and other types of students' individual research work that they took interest in.

Twice a month in the framework of the so-called "curatorial hours" (group meetings with counselling support) we performed activities aimed at raising students' self-awareness. They were various trainings, individual and group consultations and so on. We pursued the following purposes: to develop students' capability of goal-setting; to develop their skills of programming their own activities; to promote flexibility in their behaviour and students' positive thinking; to promote tolerance; to promote students' creativity. These tasks were solved by means of the following methods and forms of work: role-playing, group discussions, case-study, trainings, consultations,

informal communication with counselors, curators and other members of the teaching staff.

The first meeting was aimed at informing students of the regulations, rules and local documents of the university, its major courses and professional education curriculum (in accordance with the educational programme chosen by the students), with the history of the university and its staff. As one of the meeting activities, the students in collaboration with their teachers determined and analyzed the psychological profile of the teacher. This kind of activity helped the future teachers look at themselves as professionals-to-be and comprehend their choice deeper, improve the level of subjective control and academic motivation for further university studies.

The second group meeting included a discussion titled as «Self-regulation of Students' Activities at University» aimed to increase the students' knowledge of the self-regulation process itself, of curricular and extracurricular activities available. As a result of this type of activity, the students improved their reflexive, goal-setting and decision-making skills.

At the next meeting we addressed the issues of arranging and managing academic activities at the university: ways to deal with scientific and educational literature, to get prepared for classes, to complete the assigned individual tasks. The meeting was aimed at improving the students' level of subjective control and academic motivation, as well as at the development of their individuality, creativity and willpower.

The subsequent meetings engaged various group-training activities combined with individual and group counseling. In particular, the students were assigned the following tasks: 1) "The Host of the Show" (to develop their skills of activity programming); 2) «I'm Going Back Home» (to improve their skills of flexible behaviour); 3) «The Ladder of Achievements» (a goal-setting skill training); 4) «My Enemy is My Friend» (to promote positive thinking); 5) «The Concept of My 'Self'" (to promote and facilitate individual academic and cognitive skills, to promote tolerance and respect towards others).

V. RESULTS AND DISCUSSION

The psychological and educational experiment we conducted to develop students' self-regulation skills included the following stages: 1) Primary data collection through testing the students; 2) Training and support activities; 3) Final testing and the analysis of the survey results.

The primary data were obtained among teachers-to be freshmen, aged 17-18 ($n = 106$ people). The reliability of the research results was ensured by the representativeness of sample, by the use of complex methods adequate to the subject of the survey and its objectives, by the use of mathematical and statistical data processing.

In the survey progress, it was established that the majority of freshmen have average values of the integrative level of self-regulation skills, as well as of their individual regulatory mental functions. In the structure of the individual system of conscious self-regulation of activities, the best-developed skill is programming the upcoming actions (6.34 ± 0.13 points). The students experienced certain difficulties in modelling the

external and internal conditions significant for achieving the goal of their activity (5.44 ± 0.42 points). The survey results are presented in Table I.

TABLE I. AVERAGE VALUES OF THE LEVEL OF CONSCIOUS SELF-REGULATION OF VOLUNTARY ACTIVITIES AMONG FUTURE TEACHERS

Regulatory processes and regulatory individual properties	(M±m) (n=106 people.)
General level of self-regulation	29.96±0.40
Planning	5.88±0.15
Modelling	5.44±0.42
Programming	6.34±0.13
Evaluation and correction of performatory actions	5.90±0.12
Flexibility	6.30±0.14
Independence	5.33±0.18

^a Note: The following abbreviations are used in the table: M — arithmetic average value; m - error of representativeness

Using the Mann-Whitney U-criterion we have found out that the level of development of such a regulatory function as programming the upcoming actions is statistically significantly higher than the level of development of the other regulatory functions: goal planning ($p<0.05$), modelling of the conditions significant for achieving the goal ($p<0.05$), evaluation and correction of the performatory actions ($p<0.05$). This fact indicates a sufficiently developed ability of the students to determine and foresee the components and structure of the upcoming actions, the sequence of the planned actions, as well as the means to evaluate them.

The analysis of the data range depending on the students' level of conscious self-regulation, as well as on the level of their development of private regulatory functions showed that most of them can handle such regulatory processes as modelling the conditions of their activities, programming the upcoming actions, evaluating and correcting their performatory actions (a moderate level of development). At the same time, we noticed the predominance of the students (46.5% of the total number of the sample) with a high level of development of the planning skill, which is a component of self-regulation. We have also found out that the index of the integral characteristic of individual self-regulation in the majority of the respondents (49% of the total sample) is in the range of moderate values (Table II).

TABLE II. DATA RANGES DEPENDING ON THE LEVEL OF DEVELOPMENT OF CONSCIOUS SELF-REGULATION

Regulatory processes	Number of students with different levels of self-regulation (% of the total number of respondents)		
	Low level	Moderate level	High level
Planning	17.5	36	46.5
Modelling	14	60	26
Programming	20	47.5	32.5
Evaluation and correction of performatory actions	10	52.5	37.5
General level of self-regulation	9	49	42

To verify the correspondence of the obtained empirical data ranges to the theoretical data distribution, we used the Pearson Chi-square goodness-of-fit criterion. Its value revealed the uneven empirical distribution of the students depending on their overall level of conscious self-regulation ($\chi^2=16.18$; $p<0.001$).

The detailed analysis of the survey results reveals (see Table III below) that the students with a high overall level of self-regulation (n=34) perform significantly better in all regulatory processes. It includes planning activity goals ($U=1140.0$; $p<0.001$), modelling the conditions of their activities ($U=1107.5$; $p<0.001$), programming the upcoming actions ($U=1138.0$; $p<0.001$), evaluating and correcting their performatory actions ($U=1124.0$; $p<0.001$), compared to the students with a low overall level of self-regulation (n=25).

TABLE III. REGULATORY PROCESSES IN STUDENTS WITH DIFFERENT LEVELS OF CONSCIOUS SELF-REGULATION

Regulatory processes	Levels of conscious self-regulation, average values		Mann-Whitney U-Test Index	Significance point
	High M±m (n=34)	Low M±m (n=25)		
Planning	7.36±0.19	3.96±0.37	1140.0	p<0.01
Modelling	6.67±0.21	3.86±0.33	1107.5	p<0.01
Programming	7.64±0.96	4.58±0.32	1138.0	p<0.01
Evaluation and correction of performatory actions	7.03±0.21	4.33±0.30	1124.0	p<0.01

The data analysis revealed that the functionally significant aspects of the self-regulation process in students of the high-level group are goal setting (i.e. planning) (7.36 ± 0.19 points) and programming of the upcoming actions (7.64 ± 0.96 points). The results come down in favour of the fact that these two aspects ensure the high overall level of conscious self-regulation. However, the students from this group displayed a less-developed skill of modelling the conditions necessary to perform the planned activity (6.67 ± 0.21 points). The latter shows certain difficulties experienced by the students that would probably prevent them from achieving their goals.

Relatively equal development of all components of the individual system of self-regulation in the high-level group allowed us to talk about their harmonious regulatory profile. As of characteristic individual features of these students, we can speak of flexibility of their regulatory processes, as well as of their ability to correct and maintain them.

The study revealed that the students with a low overall level of conscious self-regulation are characterized by a moderate level of development of the following components: programming the upcoming actions (±4.58 0.32 points), evaluating and correcting their performatory actions (±0.30 4.33 points). We can conclude that the weak points of these students' regulatory profile are goal setting (3.96 ± 0.37 points) and modelling the conditions necessary to perform the planned activity (3.86 ± 0.33 points). Students of the low-level group, as well as the ones from the high-level group, experience certain difficulties in determining the external and internal conditions important for achieving their goals.

In order to determine the efficiency of the implemented experimental programme, we compared the results obtained through the primary and final testing in the experimental group (EG) and control group (CG). To determine the statistical validity of the changes that occurred in the groups we used the

nonparametric Wilcoxon T-test. The results of the analysis are presented in Table IV below.

The data analysis revealed statistically significant changes in the development of all regulatory mental functions (except for evaluation and correction of performatory actions) in the experimental group. The most noticeable dynamic changes can be seen in the growth of the overall level of self-regulation ($p<0.01$). As for the students of the control group, statistically significant dynamic changes were noted only in the level of their capability of programming the upcoming actions ($p<0.05$).

TABLE IV. DYNAMIC CHANGES IN CONSCIOUS SELF-REGULATION LEVELS, EG AND CG COMPARED

Regulatory processes and personal regulatory properties	Experimental group (n=13 students)		Control group (n=13 students)	
	Wilcoxon T-test Index	Significance point (p)	Wilcoxon T-test Index	Significance point (p)
Planning	14	p<0.05	35	p>0.05
Modelling	18	p<0.05	38	p>0.05
Programming	13	p<0.05	21	p<0.05
Evaluation and correction of performatory actions	27	p>0.05	36	p>0.05
Flexibility	14	p<0.05	34.5	p>0.05
Independence	37.5	p>0.05	29	p>0.05
Overall level of self-regulation	5	p<0.01	47.5	p>0.05

Comparing the results obtained in the experimental group in the course of the primary and final data procession we can notice statistically significant dynamic changes in the level of the students' flexibility of self-regulation, when circumstances require that ($p<0.05$). At the same time, we failed to find any statistically significant dynamic changes in the levels of personal regulatory properties in the students of the control group.

Thus, the comparative analysis of the results obtained at the initial and final stages of the experiment reveals a more intensive development of conscious self-regulation of voluntary activities in students of the experimental group. The evidence of this is the statistically significant dynamic changes in the level of the individual self-regulation features observed in the experimental group (and the absence of such changes in the control group, on the other hand). Alongside the above-mentioned, we can also observe positive dynamic changes in the development of the following mental functions: planning and goal-setting; modelling of the conditions significant for achieving goals; evaluating and correcting performatory actions; flexibility of the regulation process.

VI. CONCLUSION

Summarizing the results of the research, we **conclude**:

1. Most freshman students majoring in Education displayed a medium level of individual system of conscious self-regulation therefore we believe that there is a strong need for further work with students to develop their skills for conscious regulation.

2. Functionally able component of the individual system of students' conscious self-regulation lies in programming their actions that they will have to perform in the future. Students experience major difficulties during the analysis of external and internal conditions relevant to successful completion of their goal.

3. Students with a high level of conscious self-regulation showed the most developed regulatory processes of goal-setting and programming future performatory actions. Students with a low overall level of self-regulation skills showed poor development of goal-setting skills as well as modelling relevant performatory conditions.

4. Psychological and pedagogical training to help students develop skills for conscious self-regulation of voluntary activities includes diagnostic work to ascertain their individual features of self-regulation, information and awareness-raising work, developing students' skills, consultations with students and faculty members in self-organization and self-regulation of academic life at university.

5. Psychological and pedagogical conditions for effective training of future educators' skills for conscious self-regulation of their voluntary activities are as follows: formation of educational environment at university, contributing to further development of self-regulation of their voluntary activities; reinforcing their knowledge about self-regulation and its components, developing skills which determine the process, ensuring cooperation between all members of the educational process; successful situations during training; control of students' self-regulation.

6. The results of the psychological and pedagogical experiment produced sound evidence, which corroborates effectiveness of the implemented programme of conscious self-regulation, regulatory functions of goal-setting, modelling relevant conditions, assessment of students' work as well as assessment of flexibility of regulation as a process.

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