The European Proceedings of
Social & Behavioural Sciences
EpSBS

Future Academy ISSN: 2357-1330

https://dx.doi.org/10.15405/epsbs.2018.09.4

IFTE 2018
4th International Forum on Teacher Education

REFLECTIVE APPROACH TO THE DEVELOPMENT OF STUDENTS` CONGNITIVE ACTIVITY

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Abstract

Cognitive activity realises one of the main functions of self-reflection and is a sum of not only cognitive but also emotional-volitional processes that cause the development of both subject (determination, activity, tenacity) and subjective (curiosity, personal meanings, cognitive needs) qualities of a person. Designing a concept of reflection-based pedagogical technology, the author relies on the technology's qualities, criteria, and structure: the conceptual basis, viewed as the technology's methodological foundation, the content, which includes goals, objectives, methods, and means of achieving the goals; the procedural part, which includes a system of methods, forms of education and studying, and diagnostic tools.

In order to develop reflection-based pedagogical technology that could promote cognitive activity, a systemic model of activity was used; each component of this model was considered as a step in a single process. Through the use of this approach and with reliance on mechanisms of cognitive process, mechanisms through which self-reflection affects the cognitive activity of the subjects of learning activity were identified.

Keywords: Cognitive activity, self-reflection, learning activity, reflection-based technology.

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1. Introduction

The shift of the educational paradigm from imparting knowledge to developing personality not only demands changes in the content of education but also requires new educational technologies that will satisfy the demands of modern times. Personality-based aspect of education, on the one hand, reflects its humanistic orientation and, on the other hand, states great requirements towards the subject component of the educational process. In the age of the informational boom, when knowledge expands faster and faster, the issue of absorbing this knowledge becomes especially acute. This situation imposes higher requirements on people's ability for studying and self-understanding. In this context, the problem of improving people's cognitive activity seems pressing. Even though the question of cognitive activity has not lost its relevance in many years and has been studied from the perspectives of different scientific schools, philosophical, psychological and pedagogical concepts, modern informational society demands that scientists investigate technologies of developing cognitive activity and offer a solution to this pressing problem.

In this context, pedagogical universities can and must become an educational platform for the promotion and widespread implementation of both the idea of personality-oriented education and the idea of training specialists of a new type: carriers of new pedagogical concepts and a new mindset, people who strive for self-reflection, continuous self-education, and are capable of self-improvement.

Why is this paper focussed on self-reflection as a factor and a mechanism and on reflective technologies as a means of developing cognitive activity?

Today reflective educational technologies are presented in psychological and pedagogical papers in the form of differentiated educational process, didactic work, and self-reflection in the dialogue between pupils and teachers.

Despite the fact that reflection-based technologies are being developed by pedagogical science and implemented in educational process, nobody has managed to design a complete educational concept in which self-reflection is viewed as a universal mechanism that is applicable over the entire course of personality's development and acts as a means and method of developing cognitive activity starting from early childhood.

2. Problem Statement

The goal of the research – theoretical and experimental justification of the basics of developing students' cognitive activity by means of reflection-based technologies.

In accordance with the object, topic, hypothesis, and goal of the research, the following objectives were stated:

- to develop and theoretically justify the concept of the development of cognitive activity through self-reflection;
- to reveal the main idea, content, and functional structure of reflection-based technology as a means of developing cognitive activity of the subject of cognition at every age stage in accordance with the periodic categorisation of mental development;
- to identify organisational and pedagogical conditions for the development of cognitive activity by means of self-reflection by the subjects of cognition at different age stages;

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• to give empirical and experimental justification for reflective technology's efficiency in the development of students' cognitive activity.

3. Research Questions

Self-reflection is found almost in every sphere of psychological reality and thus has a central place in the integral structure of personality. Reflective process expands one's ability to perceive, understand, memorise, and feel. Scholars relate phenomena of self-reflection, first and foremost, to manifestations of consciousness and thinking, creativity and personality, and others (Gasanova, 2013).

Analysis of research into self-reflection indicates that properly developed self-reflection attests to a high level of manifestation of thinking processes. Essentially, self-reflection is thinking (it is thinking about thinking).

Self-reflection, as an ability to analyse oneself, activates processes of self-understanding and comprehension of one's existence, needs, and purpose in life. Experimental research shows that self-reflection is a link, a mechanism that connects the sphere of operational thinking (acts of comparison, generalisation, etc.) with the sphere of personal meanings (value given by the person to different objects and processes) if they are involved in thinking process. In our opinion, it is exactly this mechanism of self-reflection that makes cognitive process subject and subjective. In the sphere of psychology it is customary to define "subjectiveness" as the inner world of the person, his or her ideal reality. "Subjectness", on the other hand, is defined as the person's ability to be a subject. Subjectness of cognition reflects personality's activity, and subjectiveness reflects the personal meaning of cognitive process. These are two inseparable from each other parts of one reflective process in which active subjective beginning of the subject (who explores the world) originates and manifests itself.

This mechanism is the foundation for the concept of the development of cognitive activity through the use of reflection-based technologies that was designed in this study.

In their research, scholars and practitioners justifiable raise the question of inefficiency of traditional education which only imparts knowledge and facilitates acquisition of separate skills. The age of the informational boom demands more than that. The task of creating a professional who works in the sphere of "human-to-human" implies readiness for fast and flexible absorption of information, readiness to put aside usual but already outdated patterns of communication, behavior, and thinking. Ability to reflect, being able to look at oneself, one's meanings, habits, patterns of behavior and thinking as an object of cognition are necessary conditions for personal and professional development. The person's inability for independent identification of inefficient strategies of behaviour, communication, and cognition may be a serious hindrance to personal development, professional growth, and efficient studying. In this context, we consider development of cognitive activity through reflection-based technologies to be a crucial task.

4. Purpose of the Study

The value of this study is in investigation into means of developing cognitive activity from the earliest years of childhood, which is a relevant task of the theory and practice of pedagogy. The article offers a promising methodological approach to the development of reflection-based pedagogical technology; this approach shows signs of universal applicability, can be used in the creation of pedagogical

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technologies, and can be tested in scientific studies. Possible applications of the proposed reflection-based development of students' cognitive activity, as well as operational and technological deliberations that show the unity of the reflection process with components of cognitive activity, allow educators to transform such a strictly psychological phenomenon as self-reflection into a pedagogical instrument.

The author's explanation that the reflection-based approach to the development of cognitive activity is a union of subjective and subject aspects of cognition complies with the principle of humanisation of educational process.

Possibilities and versatility of the proposed reflection-based pedagogical technologies aimed at the development of cognitive activity indicate that this approach may be successfully implemented in pedagogical practice and lay the foundation for new educational technologies needed in society.

The available literature on the development of cognitive activity does not give enough attention to theoretical and practical investigation into self-reflection as a factor or reflection-based technologies as a means of developing cognitive activity.

In recent years, psychological and pedagogical studies have frequently referred to the term "technology", which came to us simultaneously with technological progress. Having appeared in the USA and England in the '60s, it has become widely used in psychological and pedagogical sciences.

Over time, the definition of "pedagogical technology" evolved. In the period between the '40s and the mid '50s, the term "educational technology" meant the use of technical tools in education. Later, from the mid '50s through the '60s, the term "educational technology" was understood as programmed learning, while in the '70s this term referred to specifically designed educational process that would guarantee results. Finally in the early '80s information technologies started to spread and became integrated into teaching process (Gasanova, 2014a).

Reflection-based technologies, as a type of pedagogical technology, are created in response to an exact pedagogical problem. In the case of reflection-based technology, it is aimed at developing students' cognitive activity. As a type of pedagogical technology it satisfies main methodological criteria: it is based on scientific concepts, all its components are logically connected, it can be adjusted and assessed, it is effective and reproducible

5. Research Methods

The major methods of the research are theoretical analysis of scientific literature, empirical and experimental study, comparative analysis, and statistical analysis.

The exact research tests included the cognitive-emotive test, assessment of an individual's ability for self-reflection, assessment of the reflective properties of thinking, assessment of pedagogical self-reflection, assessment of personality's accentuated traits, assessment of the need to achieve results, the "Locus of control" questionnaire, and psychological assessment of temperament and personal traits (Gasanova, 2014b).

6. Findings

Representative group was selected by the randomisation technique. All the participants were separated into three groups:

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1) The entire population – 6150 participants;

2) Randomisation group in which selection was performed – 990 participants;

3) Experimental randomised groups – 90 participants: 64 participants in experimental groups, 26 participants in the control group. Average age of the participants in these groups 20 years.

Educators at preschool institutions of the following cities were tested at the first (empiric) stage of the research: Moscow, Irkutsk, Makhachkala, Derbent, Buinaksk, Izberbash, Kaspiisk, Khasavyurt, Novy Urengoi, Angarsk, Usolye-Sibirskoye. The selection consisted of 540 participants. Average age of the participants: 42 years; average service record: 23 years. Assumption that self-reflection and specific traits of the subjects of pedagogical activity are interrelated was tested at this stage of the research.

Results of the empiric study were subjected to statistical analysis (data comparison with the use of the Pearson correlation coefficient, Excel spreadsheet, and version 17.0 SPSS for Windows), comparative analysis, and data interpretation. This analysis allowed us to draw conclusions about the relation between teachers' accentuated traits and an ability to reflect.

The second (experimental) stage of the study was focused on experimental testing of the reflective technology's ability to develop cognitive activity in students (future teachers).

Students of Dagestan Pedagogical University, Moscow State Pedagogical University, and Irkutsk State Pedagogical University (average age of 20 years) were the participants at this stage.

At the third stage, a repeated evaluation of the participants' reflective ability in experimental and control groups was performed, and dependence of cognitive activity (expressed through parameters of academic performance, difficulty of learning, attitude to the teachers, and curiosity) on self-reflection and subjective control was assessed.

Veracity of the obtained results is conditioned by the representativity of the participant selection and by the use of reliable research methods adequate for the hypothesis and objectives of the study.

The research was based at Dagestan State Pedagogical University.

The devised pedagogical experiment required testing of all the pedagogical conditions outlined in the hypothesis. This necessitated the use of three experimental and one control group.

The first group of participants (an experimental one, 25 people) was created in order to test reflection-based technology in which all the conditions outlined in the main hypothesis were observed.

We assumed that observation of all these pedagogical conditions would result in an increase in cognitive activity and development of sanogenic (self-improving) reflection: exactly what the teaching process was aimed at.

In order to maintain their interest in the content of studying process (that is, interest in cognition and the problem of controlling one's emotions), participants were offered the book "Resentment. Guilt" (Orlov, 2004). This book, despite being based on scientific principles, is written in a simple manner and has a wide target audience.

Participants were also offered the book "Ten Steps to Cure Resentment" (Morozyuk & Morozyuk, 2012). The students were taught via training sessions. Additionally, they had access to the Moodle system on the website of Moscow State Pedagogical University, which provided on-line informational support (video lectures, tests, exercises, case-method tasks with immediate feedback) and allowed teachers to monitor student's cognitive activity. Thus students had an opportunity to engage in a reflective dialogue, which we consider to be the leading instrument in the system of reflection-based methods.

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The second group of participants (an experimental one, 21 people) were given access to the book "Resentment. Guilt" by Yu.M. Orlov and the guide book on sanogenic thinking by S.N.Morozyuk (in paperback).

Students were taught via training sessions, which allowed them to practice their reflective skills through doing exercises.

In this group, participants were not given access to the system of informational support Moodle. The lack of online informational support made a reflective dialogue with the teacher impossible. However, the participants were obliged to keep a self-reflection log.

The third group of participants (an experimental one, 18 people) were given access only to the guide book "Ten Steps to Cure Resentment". Books "Resentment. Guilt", "Healing through Philosophy", and "Shame. Envy" by Yu.M.Orlov were not offered as a means of maintaining interest in the content of the experimental programme. Participants also had no access to on-line support via the electronic system Moodle, which deprived them of the opportunity to engage in a reflective dialogue.

In this manner, we intended to perform experimental evaluation of how certain parameters affect students' cognitive activity. These parameters included methods that maintain students' interest in the content of the learning process and themselves as the subject, methods that motivate and facilitate self-improvement, and methods that regulate those emotions that hinder effective acquisition of educational and professional skills.

The fourth group (the control one) included 26 people. The participants of this group were introduced to the books "Resentment. Guilt", "Healing through Philosophy", "Sanogenic Thinking" (written by Yu.M.Orlov), and were told about the guide book on sanogenic thinking "Ten Steps to Cure Resentment". All the other means of increasing the student's cognitive activity and developing ability for self-reflection were not provided.

Observation of the participants, testing, analysis of the results of their activity and their logs, and monitoring their achievements during experimental work provided the data necessary for the following comparative analysis. This allowed us to determine the changes of all the parameters of cognitive activity that occurred due to the use of the experimental programme and to draw conclusions regarding the validity of the proposed hypotheses.

Observation of the students in their learning activity indicated an increased interest in their main disciplines, as well as in psychology, pedagogy, and pedagogical technologies. Academic performance increased significantly, students had less difficulty in studying, they started to enjoy studying, and motivation for achieving success started to possess professional character. The final evaluation three months after the experiment showed that the students remembered 90 % of the studied material.

The method of psychological assessment of temperament and personal traits not only allowed us to see the changes in curiosity caused by the experiment but also to determine to which personal qualities these changes were related and what alterations occurred in these qualities.

Due to the experimental programme, the students' curiosity started to be driven by socially important goals aimed at mastering their future profession. Their cognitive interest started to be controlled not only by their need to know ("I want to know everything") but also by the conscious need to acquire professional knowledge ("How will this knowledge help me in my future profession?").

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The students' curiosity became subject-oriented. Now it is accompanied by the qualities of subjectness: by readiness to show perseverance in overcoming obstacles on the way towards their goal when knowledge does not surrender to the student no matter how hard he or she tries.

Interests of the subject of professional activity are formed individually by virtue of internal locus of control.

The more developed the curiosity is, the smaller the operational and personal difficulty that the subject of cognition experiences, and vice versa. It is probable that these are just subjective feelings of the participants because curiosity is always accompanied by positive emotional excitement, which helps to overcome obstacles.

During the experimental work, participants showed significantly decreased levels of anxiety, aggression, and frustration and, on the other hand, markedly greater motivation for achieving success and acquiring knowledge.

This brings us to a conclusion that reflective pedagogical technology based on the concept of reflective dialogue (with all the pedagogical conditions outlined in the hypothesis) promotes the development of cognitive activity in the subjects of education and professional activity.

Main methods of this research stage were experimentation, which provided raw data, and comparison, by means of which the raw data were analysed.

Analysis of the three experimental groups and one control group before and after the experiment allowed us not only to determine the characteristic features of cognitive activity but also to monitor the dynamics of the parameters of the respondents' cognitive activity.

The performed experiment caused significant changes in cognitive activity of the participants in experimental groups one and two:

a) academic performance rose significantly, students had less difficulty in studying, they started to enjoy studying, motivation for achieving success started to possess professional character. The final evaluation 3 months after the experiment showed that the students remembered 90 % of the studied material;

b) the participants' curiosity underwent qualitative changes: socially important goals related to professional life became its foundation; curiosity became object-oriented; it showed features of subjectness (readiness to persevere in overcoming obstacles on the way towards their goal); interests of the subject of professional activity are formed individually by virtue of internal locus of control;

c) operational and personal difficulties that students experienced during education lessened; participants showed significantly decreased levels of anxiety, aggression, and frustration;

d) motivation for achieving success and acquiring knowledge rose significantly.

7. Conclusion

Significant changes were also shown in the students' ability to reflect. The "sanogenic thinking" parameter rose significantly, while all the other parameters of defensive reflection decreased, which indicates qualitative changes in reflective processes.

Participants of the third group showed significant changes of the parameters of cognitive activity. However, unlike those of the two previous groups, these changes were negative.

The research did not show an increased interest in the main disciplines, including psychology. The academic performance remained the same, students started to experience even greater difficulties in studying, their attitude towards learning worsened, and analysis showed a statistically significant decrease in motivation for achieving success. The final evaluation showed that students remembered only 25 % of the information learned during the experiment. We attribute this, on the one hand, to springtime fatigue and, on the other hand, to a certain degree of coercion (participants were tasked to study independently, and the study was compulsory). However, the participants of the two previous groups were, most likely, protected from these factors by the reflection-based pedagogical technology which satisfied all the pedagogical conditions stated in the hypothesis.

Despite the fact that participants of the third group were given an opportunity to improve themselves independently and were given all the information necessary for developing their ability to self-reflect, the final evaluation showed no qualitative changes in the students' self-reflection.

Participants elicited a psychological defensive reaction to a fear of failure, a sense of guilt, shame, and resentment both prior and after the experiment without any significant changes. Similarly, nothing changed in the students' mental automatic actions and their propensity for rationalising their problems and failures through depreciation of the object or circumstances that seemed insurmountable. These facts are another piece of evidence that a specifically designed educational programme, in our experiment it was reflection-based technology, promotes the development of both cognitive activity and ability for self-reflection.

In the control group, as in the third group, respondents showed no significant changes in cognitive activity. Their curiosity underwent no qualitative changes during the time of the experiment. This confirms our assumption that cognitive activity either does not develop without the purposeful use of methods and tools or develops more slowly than with the help of a special technology, in our case it is reflection-based technology aimed at the development of cognitive activity.

Participants in the control group showed no significant changes in their ability for self-reflection. Results of the performed experiment confirm the hypothesis of this study. Comparison of the experimental data proves that reflection-based pedagogical technology can promote the development of cognitive activity.

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