Development of Critical Thinking of Students by Means of Active and Interactive Methods of Training

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Abstract. In the conditions of modernization of Russian education there was a structural and substantial change of system of higher education. The happening transformations are caused by the amplifying tendencies of globalization, a humanization and informatization of education, need of use of intellectual and creative potential of the person for creative activity for all spheres of life and sustainable economic development of Russia. Therefore before the higher education the additional purposes during the training and development of students are set. Namely in FGOS VPO and normative documents, provisions and instructions it is specified about development of a professional orientation of the identity of students that it is shown in ability to build their flexible trajectory of the activity, in ability to adapt in constantly changing circumstances, in development in them of critical thinking, etc. Therefore in this article various approaches and interpretations of rather critical thinking and its components are considered by us. And also some options of development of critical thinking of students on a lecture practical training are offered.

1. Introduction

According to the Federal state educational standard of higher education of one of main objectives training of the qualified specialist of appropriate level and the direction, competitive in labor market, competent, masterfully using the profession and guided in adjacent spheres of action, having new critical thinking, high mobility, etc. is.

The analysis of psychology and pedagogical literature which is carried out by us showed that one of an integral part of professional competence of students is the developed critical thinking.

Foreign and domestic researchers (Antonius of [1], M. Skriven [2], G. Lindsey [3, 4], D. Kluster [5], D. Halpern [6], R. F. Thompson [7], K.S., M. M. Levina, A. V. Bryushinkina, T. Yu. Merzlyakova, etc.)pay much attention to consideration of critical thinking from increase in informative activity of students, independence, etc.

Criticality of thinking as ability is considered by G. I. Bizenkov, A. V. Butenko, S. I. Wexler, A. A. Smirnov, B. M. Teplov, E. A. Hodos, etc.

In B. G. Ananyev, V. V. Afanasyev, P. Ya.Galperin, A. V. Zaporozhets, A. N. Leontyev, N. A. Menchinskaya, D. Polya, L. M. Friedman's works and others the critical thinking is presented as an element of creative thinking.

In English a concept the critical thinking means ability to reflect over how the person gains knowledge.

The researcher I. O. Zagashev presented critical thinking as "the process including abilities: to analyze, draw conclusions, to interpret" [1]. What most widely opens a concept of critical thinking, indicates thought processes with which the person conceiving crucially operates.

According to M. Skriven, the critical thinking means "thinking estimated, reflexive. This open thinking which is not accepting dogmas, developing by imposing of new information on personal life experience" [tsit. on: 8]. It is possible to tell that the critical thinking is a starting point for development of creative thinking, moreover, both critical and creative thinking develop in synthesis, interdependent.

In definition G. Lindsey, K. Hall the critical thinking is presented as "… verification of the proposed solutions for the purpose of definition of field of their possible application. The creative thinking is directed to creation of the new ideas, and critical - reveals their shortcomings and defects" [tsit. on: 8, page 88].

Here authors differentiate creative and critical thinking. Showing thereby that the creative thinking is directed to creation of a new product, and the critical thinking in turn subjects to check already created product of cogitative activity.

In the researches I. O. Zagashev notes that "critical thinking – the directed thinking, the process focused on a solution which demands the developed skills:" [tsit abilities to analyze, draw conclusions, to interpret …. on: 9].

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A.S. Sharov marks out the following qualities of critical thinking: logicality; integrity; organization" [10].

Allocation of such qualities, according to A.S. Sharov, corresponds to practice inquiries including what "… development of qualities of critical thinking is one of the education purposes" [10].

But, despite various treatments, a concept the critical thinking the Russian and foreign authors is as follows: to think critically – means consciously to think.

Thus, the main factor of successful development of critical thinking, correctly organized educational process during which the student learns to allocate the main thing is, to analyze, choose the most effective way of approach to a problem including own. It should be noted that the developed critical thinking also as well as informative activity forms further a basis for successful self-education, self-development and self-education of the expert.

2. Technique

Methods of determination of the level of development of critical thinking can be divided into three groups: a) a complex of means, receptions and the technician of assessment of cogitative competences of criticality of mind of application to a wide class of problems, situations, values and installations on criticality; b) private techniques and technicians of assessment of abilities and abilities to think critically in certain situations, concrete subject domains; c) estimation of the separate aspects of critical thinking expressed as concrete abilities of type to see and comprehend problems, to compare personal and others' proofs at solution of the problem.

Research tools:

1) technique "Formation of difficult analogies";

2) "Whether I Am Able to Think Critically …?" test.

Diagnostics which is carried out by us included personal aspect.

Determination of the level of development of critical thinking of students became the purpose of personal aspect.

Selection of a research

68 students of department of PIMNO TIA (f) SVFU participated in a research.

Results of a research

By a technique "Formation of difficult analogies" ability of students ability to allocation of the difficult, abstract logical relations was determined.

Own the average level of development of critical thinking - 42% of examinees, low level is characteristic of 38% of students, high level - 20% of students.

According to the "Whether I Am Able to Think Critically …?" test it was revealed that 48% of students are able to give definitions and to do distinctions, to compare similar situations.

Results of diagnostics confirm need of development in these students of critical thinking in the course of training.

We also when determining the level of development of critical thinking of students relied on the levels of development of critical thinking developed by B. Blum:

1) reproduction – recognition and a call of information;

2) understanding - interpretation of material, schemes, transformation of verbal material to mathematical expressions etc.;

3) application of concepts, laws, procedures in new situations.

4) the analysis — allocation of the hidden assumptions, finding of mistakes in logic of reasonings, carrying out differentiations between the facts and the investigations etc.

5) synthesis - writing of the creative composition, scheduling of a research etc.

6) assessment of logic of creation of material, importance of a product of activity etc.

3. Main part

The critical thinking has not only qualities, but also abilities, so D. Halpern, reflecting on intellectual abilities of critical thinking, stops attention on the following from them:

1) "analysis (conclusions);

2) promotion, formulation, development of hypotheses;

3) establishment and creation, search of analogies, metaphors;

4) activization of earlier acquired knowledge;

5) activization of the cause and effect relations;

6) analysis of the importance;

7) comparison — comparison — opposition;

8) application in actual practice;

9) counterargument;

10) assessment and its reliability (validity);

11) generalization of the ideas;

12) studying of other points of view" [11, page 24].

Allocation of these abilities, most fully characterizes critical thinking as process conscious, caused by inquiries of modern education.

Proceeding from the analysis of the received results during diagnosing, and also is higher the presented criteria a main objective of our work development in students of psychology and pedagogical education along with development of informative activity and development of critical thinking in process studying, that is expansion of cogitative competences for the effective solution of social, scientific and practical tasks is.

The analysis of the federal state educational standard which is carried out by us in the direction of preparation 050400.62 – "Psychology and pedagogical education", standard and legal documents showed that transition of an education system to multilevel preparation involves also changes in requirements to educational process, to the new modes of training.

One of such modes can allocate use in educational process of interactive forms and methods of training which are aimed, first of all, at the development of ability in students to think extraordinary, formation of professional competences of future experts; implementation of feedback; stimulation of motivation and interest at subjects of educational process in the field of the studied objects; development of skills of the analysis, criticality of thinking, communication of students; development

of skills of communication of students and interaction in group; formations at them valuable and orientation unity of group, etc.

Therefore a certain percent of a lecture practical training in higher education institution has to be given in interactive forms or with use of active and interactive methods. "Specific weight of the classes given in interactive forms is defined by a main goal of OOP of a bachelor degree, feature of the contingent of students and content of concrete disciplines..." [12]. In general as it is specified in FGOS VPO in the direction of preparation 050400.62 – "Psychology and pedagogical education" in educational process they have to make not less than 25% of classroom occupations.

The concept "interactive methods" can be translated as methods of interaction of participants among themselves, and the training which is carried out by means of these methods can be considered interactive, that is, constructed on interaction.

In psychology the interaction means "ability to interact or is in the mode of a conversation, dialogue with someone (person) or something (for example, the computer)" [13]. Therefore, interactive training is, first of all, dialogue training during which interaction not only of the teacher and the trainee, but also trainees with each other is carried out.

It is possible to allocate with feature of such interaction: stay of subjects of education in one semantic space; joint immersion to the problem field of a solvable task, i.e. inclusion in uniform creative space; coherence in the choice of means and methods of implementation of the solution of a task; "joint entry into a close emotional state, experience of the conformable feelings accompanying acceptance and implementation of the solution of tasks" [12]. The teacher at such training performs function of the consultant, but not mentor. Students act as subjects of activity which actively participate in knowledge process, following the individual route.

Thus, practically all students are involved in knowledge process, they have an opportunity to understand and reflex on the fact that they know and think; develop ability to listen to other point of view and ability to cooperate.

On a lecture practical training regularly we apply various active and interactive methods which use is aimed at the development of critical thinking and motivation of students: a heuristic conversation, brainstorming (attack), business games, a method projects, a discussion, playing of situations, opros-Kviz (control), trainings (sensitivity, administrative), a video training, imitating games, collective solutions of creative tasks, case-study, modeling, discussion of videos on an occupation subject, the Kvadro method (according to V. Müller, S. Vigman), moderatorsky seminars, clusters, drawing up sinkveyn, web quest, etc.

The listed methods have to be applied in educational process together with interactive forms.

In modern pedagogics the following more common interactive forms are presented: general discussion, educational discussion, group discussions; practical works; various forms of mutually training and mutually control; laboratory and research works / protection of projects is a form at which the student conducts an independent research of various subjects during the long period of time at the end of which he provides and protects the work; problem and search training; distance learning; presentations (as evident option of lecture and practical material); work in small groups and couples of replaceable (dynamic)/constant (closed) structure – a form of dialogue interaction; seminars, etc

In the conditions of use of new educational technologies and methods of training when to the trainee the role of the subject of training is delegated, the operating time of practical experience of use of information technologies, namely web quests, sinkveyn at the organization of informative independence and development of critical thinking of students is especially urgent.

Web Quest is a special type of the information, problem-oriented tasks of individual or group training directed to formation and development of skills of independent activity, search and research activity of students in the course of assimilation and a research of a training material.

The purpose of use of web quests by us in training of students is development of critical thinking, abilities of the analysis, synthesis, definition of own position, expansion of a world outlook outlook, information assessment at rational use of school hours for obtaining necessary information on a certain question, a subject, a problem and the subsequent its processing.

The web quest is an independent search activity on Internet open spaces on one or several branches of in advance prepared route to the definite purpose set at the beginning of a route during which it is necessary to receive and analyze the found information to pass to the following stage on the ways to the purpose.

We use the following types of web quests in the activity:

1) reproductive: granting material from various sources without their independent processing;

2) reproductive and cognitive: presentation, article, message, performance before audience, virtual travel, belief, etc.;

3) cognitive: search, systematization and analysis of information on a certain subject;

4) cognitive and creative: development of the project on the basis of the set conditions on the available points; search of the answer to a question;

5) creative: implementation of the conceived scenario in various genres; justification of own point of view on a certain problem.

For the first time the term "web quest" was offered in 1995 by Berney Dodge, professor of educational technologies of San Diego University (USA) [13].

Having analysed scientific research of the author, the conclusion was drawn that in training of students of psychology and pedagogics we can use the following types of tasks for web quests:

1) retelling - demonstration of understanding of a subject on the basis of representation of materials from different Internet resources in a new format: creation of the presentation, poster, story;

2) planning and design - development of the plan or project on the basis of the set conditions;

3) self-knowledge – any aspects of a research of the personality: work with diagnostic techniques in on - line - the mode.

4) compilation – transformation of a format of information obtained from different sources: creation of the book, glossary.

5) a creative task – creative work in a certain genre - creation of a psychological portrait on the basis of fiction, scientific sources, drawing up consultations for teachers and parents;

6) reaching consensus – development of the decision on an acute social and psychological or pedagogical issue;

7) journalistic investigation – an objective statement of information (division of opinions and the facts);

8) belief – inducement on the party of opponents or neutrally adjusted persons;

9) scientific research – studying of various phenomena, opening, the facts on the basis of unique on - line - sources.

For the first time we used web quest in practice of teaching discipline "Psychology and pedagogical work with younger school students with deviant behavior" in 2010-2011 academic year.

Students made web quest on a problem of one of types of deviant behavior younger school students and teenagers. The research of sources of emergence and development of the chosen type (form) of deviant behavior became the purpose of creation of web quest, namely:

1) social and legal aspect (information search about psychological, social, material aspects of the emergence chosen like deviance, a research of a problem of the chosen deviance type to the Russian Federation and its consequences for society the analysis of information on actions of the state on solution of the problem of the chosen type (form) of deviance);

2) psychology and pedagogical aspect (causes; "portrait" of the child of this form of deviance; the main signs of this form of deviance of feature of work with parents of such child, the main strategy of behavior of the teacher with the child; to make "crib" for adults or the recommendation (the rule of work) with such child.

After completion of work on web quest the student most presentably presents the performed task in the form of the presentation of Power Point, the multimedia presentation (the slideshow which is followed by a lecture), web pages.

For the purpose of deeper judgment by students of a subject, development of creative abilities, cogitative operations and individual qualities of thinking of students us is used also such method as drawing up a sinkveyn.

In many sources синквейн is considered as the poem without rhyme consisting of five lines in which the subject on the studied subject is generalized.

During the work with sinkveyna it is necessary to follow on the following steps:

1. On the first line one word a noun which designates a subject of a sinkveyn registers.

2. On the second line there is a description of a subject two, three adjectives.

3. On the third line three words which describe actions within this subject are specified (there can be verbs and participles).

4. On the fourth line the phrase from four (five) words of different parts of speech expressing the relation to a subject is written. At this stage students can also specify a popular expression or the quote, a proverb.

5. On the fifth line one or two words specify a subject synonym.

On a lecture and practical training on disciplines of a psychology and pedagogical cycle for the purpose of fixing of material, assimilation and storing of new terms by students sinkveyna as individually, and in groups often are formed. By drawing up sinkveyn at students mental, creative, figurative and other abilities develop.

For example, during the studying and work with concepts the personality, development, socialization, the speech, education were made the following sinkveyna:

"Personality"
1. Personality.
2. Individual, unique.
3. Is not born, formed, becomes.
4. Result of process of education and self-education.
5. System of behavior of the individual.

"Development"
1. Development.
2. Irreversible growing.
3. Passes, changes, evolves.
4. The process directed to improvement.
5. Increase in complexity.

"Speech"
1. Speech.
2. Oral, written.
3. To speak, listen, read.
4. Represents psycholinguistic process.
5. Communication.

"Education"
1. Education.
2. Education, average, the highest.
3. To form, learn, study.
4. Purposeful cognitive activity of people.
5. Process.

During the work with sinkveyna it is possible to use the following receptions also: drawing up the story on a ready sinkveyn with use of the words and phrases which are a part of the offered sinkveyn; implementation of adjustment and improvement of a ready sinkveyn, definition and recognition of the concept according to the description offered in the sinkveena, etc.

Thus, the offered receptions allow students to synthesize the obtained information; make active a lexicon and informative independence; develop cogitative activity, mental abilities, etc. The developed

listed qualities provide further activity of students in constant mastering knowledge and their application in practice.

4. Conclusion

So, the listed interactive methods and forms allow to realize a subject - subject approach in educational space at the organization of the process of knowledge, and promote thereby development of critical thinking and an active and informative position of students that corresponds to urgent educational requirements of modern educational process.

Thus, the basic principles when using interactive methods and forms in the course of knowledge by students of disciplines of a psychology and pedagogical cycle will be the principles of dialogicity, cooperation, nature conformity.

5. Findings

1. Having considered and having analysed psychology and pedagogical researches T. Yu. Merzlyakova, I. O. Zagashev, G. Lindsey, K. Hall, R. Thompson, etc., we came to a conclusion that the critical thinking is the process focused on a solution which demands the developed skills: abilities to analyze, draw conclusions, to interpret, estimate, argue.

2. Use of methods and receptions at development of critical thinking of students on a lecture practical training promotes development in students of the following skills and abilities:

1) works with the increasing and constantly renewed information stream in different fields of knowledge;

2) uses of various ways of integration of information;

3) statements of questions, independent formulation of a hypothesis and solution;

4) developments of own opinion on the basis of judgment of various experience, the ideas and representations;

5) reasoning of the point of view and accounting of the point of view of others;

6) ability to be engaged independently in the training (the academic mobility);

7) to participate in joint decision-making;

8) ability to cooperate and work in group, etc.

Besides, the mechanism of critical thinking includes the cogitative operations defining process of a reasoning and the argument: statement of the purpose, identification of a problem, promotion of hypotheses, reduction of arguments, their justification, forecasting of consequences, acceptance or rejection of the alternative points of view. It includes ability to apply basic intellectual abilities (knowledge and understanding) to synthesis, the analysis and assessment of difficult and ambiguous situations and problems. Here it is possible to refer abilities of identification of a problem, clearing of a situation, the analysis of the argument, comprehensive study of a question, development of criteria for assessment of decisions and reliability of sources of information, avoidance of generalizations.

References

[1]   Antonius D, Misteriel N Amerikanskansky Philosophical Association (APA) http://www.psychiatry.org/practice/professional-interests/hiv-psychiatry

[2]   2003 Critical Thinking, Picciotto, Madeleine 216

[3]   Hall C S, Lindsey G 2005 Theories of Personality N Y John Wiley and Sons *M.: "PCB +"* 1997 Terminological editing of V Danchenko *K.: PSYLIB*

[4]   Lindsey G, Hall C S, Thompson R F Creative and critical thinking Anthology of the general psychology Issue **III** Subject of knowledge edition V V Petukhov

[5]   Klooster D 2001 What is Critical Thinking? Thinking Classroom Peremena *Spring* **4** 36-40

[6]   Halpern D F 2003 Thought & Knowledge An Introduction to Critical Thinking 4 ed. Mahwah (New Jersey)

[7]   Semaly L M 2000 Literacy in Multimedia America New York-London: *Falmer Press* 243

[8]   Fedorov A V 2007 Development of media competence and critical thinking of students of

pedagogical higher education institution *M.: MOO of the runway of UNESCO* 616

[9]   Technology of development of critical thinking in higher education institution: prospects for school education of the 21st century http://letopisi.ru/index.php

[10]   Spheres D A 2006 A reflexive technique of development of critical thinking of school students in the course of training in programming in a profile course of informatics and information and communication technologies the *Bulletin of the Omsk state pedagogical university* **5** 60

[11]   Halper D 2000 Psychology of critical thinking *M.: Vlados* 387

[12]   The federal State Educational Standard of Higher education in the direction of preparation 050400 Psychology and pedagogical education No. 200 is approved by the order of the Ministry of Education and Science of the Russian Federation of March "22" 2010

[13]   Clarain M V 2000 Interactive training – the instrument of development of new experience *Pedagogics* **7** 12-18