



Modern Teaching Tendencies of Critical Thinking Forming of University Students

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ABSTRACT

The significance of the research problem is conditioned by the influence of global mass media on personality, providing it a unique ability to access information from anywhere in the world. To achieve the state when the identity of the student can feel confident in the process of choice and decision making, it is important to teach students the skills of critical thinking. In this regard, this paper is aimed to identify trends in didactic and pedagogical solutions to the problem. A leading research method is a constructive monitoring that allows using for the concept of “critical thinking” of the modern sense, due to the characteristics of the global information environment. The paper reveals the typology of thinking, the structure and content of its kinds; reveals peculiarities of process of formation of students’ critical thinking, defining transformations of the learning content (interdisciplinary units) and learning technologies (interactive, design, computer); justifies the set of didactic tendencies of forming of students’ critical thinking. Productivity of the revealed complex of didactic tendencies for students’ critical thinking formation is proved. The paper submissions can be useful for teachers, listeners of the system of qualification’s improvement and retraining of teachers, methodologists, post-graduates and University students.

Keywords: Critical Thinking, Teaching Strategy, Global Information Environment, Structural Monitoring

JEL Classifications: I21, I25, I28

1. INTRODUCTION

Contemporary processes of social reality are defined by the current values of the information society. Unlike the industrial society, in which everything is focused on the production and consumption of goods, information society produces and consumes intelligence and knowledge, increases the proportion of creative work in all spheres of life activities.

A clear example is the experience of corporations of developed countries (USA, England, Japan) in which in the last decades as the main management functions are efficiently implemented: The establishment and maintenance of a creative process of innovations’ production; the creation of systems to build the knowledge, experts’ competencies of critical thinking; managing of the processes of such knowledge’s accumulation; implementing of critical thinking in the production of goods with high level of intelligence (Kuznetsov, 2003).

Analysis of information flows in various fields of knowledge shows their intensity and swiftness of this level, which suppresses not only the thinking mechanisms of the modern educated person, but just is not retained in his memory. Because in addition to the fundamental knowledge within their professional field people should possess more competences of permanent work with information as in narrow scope of activities so in related fields, because the solution of the vast majority of problems is at the intersection of subject areas.

One should not underestimate the importance of electronic means of communication, the Internet in particular, making their non-standard contribution to the expansion of information. This research establishes the specificity of this contribution, as determined by the dualistic nature of information of Internet resources.

On the one hand, it enriches the personality, developing its intellectual potential, on the other, manipulates the minds of

2. LITERATURE REVIEW

consumers of information, because the information basically reflects a social order on the personal, political, social, cultural or any other kinds of information flows.

The identity of the student in these circumstances is under strong pressure of informational influence, in opposition to which it needs formed intellectual capacity of critical thinking as a set of knowledge, abilities, skills, personal experience of knowledge's use in practical activities, which form the basis for a commitment to a competent and objective analysis of incoming information; the possession of knowledge and skills of critical analysis and synthesis of information from the standpoint of conformity to interests of personality, society and production, morality and moral values; purposes of information's use are formed; methods of implementation are projected; objective conclusions are developed about its significance for vocational training of the personality, etc.

Despite its practical importance, the didactic tendencies of critical thinking formation, due to continuing in the education system of the traditional paradigm of transferring to students of ready-made knowledge, remain to date as poorly developed, although their fundamental component is represented at a high level as a philosophical, psychological and sociological problem (Guilford, 1965; Makhmutov, 2001; Fromm, 1950; Halpern, 2000; Shadrikov, 2002; Fayzullina, 2015a; 2015b). Therefore to talk about holistic understanding of the phenomenon for the educational practice of universities is early yet. Urgent attention of researchers belongs to the problem of theoretical and methodological justification of the structure and content of the didactic foundations for the development of students' critical thinking, modern meanings of which are reasoned by the influence of the global information environment on the educational process of higher school.

Based on the established trends in the course of the study the typology of mentality of the personality, structure and content of its types is studied in detail; the structure and content of critical thinking is defined as a specific form of intellectual activities of the individual and the process of its formation, as a natural transition from didactic knowledge to a creative, interdisciplinary, transforming and self-transforming one; peculiarities of process of students' critical thinking formation are revealed, determining trends of change of the learning content (interdisciplinary units) and learning technologies (interactive, project, computer); the set of didactic tendencies to form students' critical thinking is justified (the focus of the learning process on the development of analytical style of thinking, flexibility in the quality of the mind, the creativity in cognitive processes, intellectual thought processes, problem orientation of cognitive skills, creative skills to learn, interdisciplinary knowledge, skills, competences).

The results of the study confirm the efficiency of the didactic tendencies' identified complex to forming students' critical thinking using experimentally proven criteria: Readiness to plan their own learning - cognitive activities; flexibility of thinking; the ability to generate unusual, innovative ideas; persistence in results' achieving; focus on the opening of the new; the capacity for awareness of their experience; the willingness to correct their mistakes (self-correcting).

2.1. The Concept of Critical Thinking

- The essence of the concept is determined by the philosophical generalization of the process of thinking as the highest stage of human knowledge of reality that enable to gain knowledge about such objects, properties and relations of the real world that cannot be directly perceived on the sensory level of knowledge (Encyclopedic dictionary of philosophy, 2003).
- The structure and content of critical thinking are characterized and determined by the orientation on: (1) Knowledge, because all the binding thoughts, lining up in the thread of reflection and reasoning are based on available knowledge, experience and "look in" into the unknown; (2) the evaluation component which is not identical to the notion of criticism: "When we think critically, we evaluate the results of our thought processes - how effectively we coped with the task" (Halpern, 2000); (3) independent thinking in establishing of links between phenomena and processes of the surrounding world based on critical, reflexive thinking, "the only valuable for the education and development of personality" (Dewey, 1997); (4) the complex of intellectual competencies: Finding of analogies and other kinds of relationships between pieces of information; determining of relevance of information for structuring and solving of problems; finding and evaluating of solutions or alternative ways of addressing the problem; identifying of problems in the text of information; (5) the scope of application (the acquisition of knowledge, understanding of knowledge, use in new situations, analysis, synthesis, evaluation).

Based on the established indicators, in the research process new meanings of concepts are identified that correspond to the imperatives of the information society: Critical thinking is the ability of the person to see the inconsistency of the utterance (thought) or behavior of another person to common belief, norms of conduct or their own ideas about them; to realize the truthfulness or falsity of the theory, provisions, illogical statements and respond to them; ability to separate false, wrong from right, correct; to analyze, prove or disprove, assess the item, task, to present a sample of statements and conduct.

2.2. Alternative Approaches to the Study of the Problem

The origins of ideas about critical thinking are in the work of Dewey (1997), devoted to reflexive thinking. His findings don't lose their importance even at present especially about critical thinking as a set of the following qualities:

- Commitment to activities' planning
- Flexibility of thinking (either "limited" or closed mind or an "opened," flexible mind)
- Perseverance in results' achieving
- Self-correcting
- Awareness of the learning process
- The search for compromise solutions.

In other English-speaking sources (Miller, 1964; Moore and Parker, 2004) the results are presented about research problems

of critical thinking, designated as the directed thinking, i.e., aimed at obtaining of the desired results. The specific features of the problem's development are established being defined mainly by global patterns, and achievements of scientific and technical progress.

A significant contribution to the development of the problem of critical thinking was made by the researchers of the American National Council for the development of critical thinking. At the beginning of the XX1 century this group of scientists identified the intellectual component in the structure and content of the concept: "Critical thinking is the intellectually organized process, aimed at active activities on comprehension, application, analysis, synthesis or evaluation of information received or generated by observation, experience, reflection, reasoning or communication as a guide to action or the formation of beliefs" (Halpern, 2000).

Important role for the development of problems of university students' critical thinking belongs to research of Russian scientists (Makhmutov, 2001; Shadrikov, 2002; Kholodnaya, 1997; Fayzullina and Saglam, 2015a; 2015b), who developed a categorical framework (objectives, principles, structure and content of process of critical thinking formation as a key component of intelligence, logical thinking and creativity), conceptual approaches and didactic content, reinterpreted to meet modern educational strategies.

In the works devoted to the study of the intellectual potential of University students (Vyugina, 2015; Grebenyuk, 2000), the features of innovative technologies are described to form critical thinking of the individual. Critical thinking by these authors is rightly referred to the results of intellectual activities of students, in the process of communication's implementing of intelligence, creativity, logical and critical thinking.

3. RESULTS

3.1. Types and Kinds of Cognitive Thinking

In the course of the study the cognitive thinking is used as an explicit expression of the intellectual component of the personality's experience. Traditionally, in educational practice of higher education institutions it is defined as the process of internal handling of information and processing of its content encoded in the perceptions presented by concepts (Grebenyuk, 2000).

There is a distinction between reproductive (non-independent) and productive (independent), convergent (traditional) and divergent (creative) types of cognitive thinking. Reproductive and convergent types of thinking are based on those cognitive abilities that guarantee a good assimilation of the so-called ready-made knowledge, developing mostly memory and attention. They have their importance in the training of students, but their development is only a part of the educational process. A type of convergent thinking is aimed at finding of the best, the only way to solve the problem or search for the only correct answer to the question. Cognitive thinking of a creative character is referred to the divergent type. First results in the study of divergent thinking are presented in the work devoted to the study of intelligence (Guilford, 1965).

Guilford (1965) studies four qualities of divergent thinking, which are necessary for personality to development intellectual abilities that define creative activities: Fluency - the ability to generate large number of ideas; flexibility - the ability to generate ideas in different areas; originality - the ability to issue non-standard, unusual ideas; readiness - the ability to elaborate in detail the ideas emerged.

In the course of this research the creative characteristics of divergent and convergent types of cognitive thinking are identified, such as: Students' ability to wonder and learn new things; the ability of the students to find solutions in unusual situations; orientation of thinking at the opening of the new and abilities to deep conviction of his experience.

These properties of cognitive thinking characterize creative direction of its development, thus bringing together traditional forms and creative ones (Table 1).

The development of cognitive thinking, as evidenced by the results of the study, is one of the important objectives of personality's development of the student. But for modern high school graduate it is not enough to possess only cognitive thinking for understanding of the laws of nature and social life, for creative adaptation to social reality, to improve their own views on many issues and especially on issues of professional development.

Significant potential for personal creative development, as evidenced by the results of the study belongs to the following types of cognitive thinking:

Table 1: Comparative characteristics of the types of cognitive thinking

Thinking	Characteristic feature	Diagnosis	Prognostic significance of the results	Creativeness indicators
Convergent	Thinking is aimed at finding of the only correct result	It is diagnosed with the help of traditional tests of intelligence	It is impossible to predict intellectual achievement of a person in real life	Awareness
Divergent	It is associated with the generation of multiple solutions based on unambiguous data	It is diagnosed with the help of specialized tests	Poorly predict actual creative achievements of man in every day and professional activities	Resourcefulness
Creative	It is connected with finding if innovative solutions "on the basis of ambiguous data"	It is diagnosed with the help of specialized research	Predict real creative achievements of man in his every day and professional activities	Genius

- Logical thinking is performed according to the rules of mental operations (analysis, synthesis, comparison, generalization, etc.). The qualities of logical thinking are sequence, logical consistency, verifiability, validity. Logical thinking looks for and proves the necessity of a single path and does not allow the possibility of others, often excludes other ways (Bono, 1998).
- Problematic thinking is the kind of creative thinking, the structure of which produces the following sequence of mental search: Vision of the problem - its statement (verbal formulation) - The nomination of assumptions (hypotheses) about the way to solve the problem - the proof or refutation of hypotheses. This structure can be “collapsed” with the insight, guess about solving (Makhmutov, 2001).
- Creative thinking in addition to logical operations (analysis, synthesis, comparison, generalization, etc.), is characterized by the presence of sudden hunch, insight, intuition, generating a new product: A thought, a way of task’s or problem’s solving, inventions, and others (Eysenck, 1995).
- Lateral thinking is an integral part of logical and creative types of thinking. It is characterized as a search of possible ways of choosing of the optimal way to solve the problem. If logical thinking is characterized by a focus on the “correctness” of judgments, then lateral thinking seeks to discover and develop non-standard ways (Bono, 1998).
- Critical thinking is the ability of the personality to see the inconsistency of the utterance (thought) or behavior of another person to the generally accepted norms of behavior, attitudes, or its own view of them; to realize the truthfulness or falsity of the theory, provisions, illogical statements and respond to them; ability to separate false, wrong from right, correct; to analyze, prove or disprove, assess the item, task, show a pattern of statements and behavior (Makhmutov, 2001).

In the course of the study the peculiarities of students’ educational activities were revealed due to the implementation of the types and kinds of cognitive thinking. One of the variants for implementation of activities: Logical thinking of the person - As a thinking according to the rules; the intelligence as the learning of mental activities, standard of thinking and behavior of the student; creativity as a mental search and creation of new; critical thinking - detection of the foundations of the new through the denial of the old, wrong, mistaken one. In all variants of activities approved during the conducted research, critical thinking is manifested in the presented sequence.

3.2. Features of Process of Students’ Critical Thinking Formation in the Educational Process of the University

1. They are determined by the applications of critical thinking in the learning process:
 - The acquisition of knowledge as of the cognitive area, which is to study so of related areas.
 - Comprehension is organization and relating of new knowledge with previously learned one (the ability to convert information, interpret its main ideas).
 - Application is using of new knowledge in accordance with certain rules and principles in new situations (the ability

to apply selected facts and figures in new situations in order to support or refute the author’s position).

- Analysis is critical thinking, concentration of attention on individual aspects of information, their importance as a whole (the ability to compare and contrast main ideas of the text read or heard, with known from other sources to make the necessary findings, conclusions, important for the confirmation of the previously formulated hypothesis or hypotheses.
 - Synthesis is critical reflection, the focus on the connection of the individual parts in the new knowledge (the ability to synthesize selected data, to develop logic of general argumentation based on selected and pre-analyzed data in order to reach a final conclusion).
 - Assessment is critical thinking, concentration of attention on the formulation of judgment, its justification on the basis of the received information (the ability to determine the credibility, authenticity of facts and data to prove their own point of view and decision).
2. They are carried out in the process of realization of algorithm to form critical thinking in the educational process:
 - The goals of the activities are defined. Goals may include selection of one of the variants of the solution, production of solution in the absence of options; synthesis of information; the assessment of the reliability of arguments; the assessment of likely developments; validation of source data; quantification of uncertainty.
 - The level of awareness about the issue, ways of missing information sources’ obtaining are determined.
 - The thinking skills that are necessary to achieve this goal are identified. Knowing of how to get to goals is the driving force of critical thinking.
 - The conformity of the result to the goal is established, the meaning of the decision made is determined.
 3. It is specified by teaching techniques of management of students’ critical thinking (Table 2):

3.3. Complex of Didactic Tendencies to form Students’ Critical Thinking in the Learning Process of the University

In the course of the study a set of didactic tendencies to form students’ critical thinking is substantiated:

- The focus of the learning process on the development of analytical thinking style.
- Orientation of training activities on development of flexibility of students’ thinking.
- The use of creative techniques in cognitive processes.
- Focus on the problematic character of the educational process, creative ability to learn.
- Focus on the goal of self-organization and self-transformation of the educational process through the implementation of interdisciplinary training modules.

The first procedure in the process of implementation of the established trends is the restructuring of the content of studied

Table 2: Didactic techniques of management of students' critical thinking

Didactic situations	Skills of critical thinking
Give example of...	Application (example of knowledge's using)
How it could be used for...?	Application
What will happen if...?	Assumption
What is implied by...?	Analysis/conclusion
What are strong and weak sides...?	Analysis/conclusion
What it looks like...?	Identification and creation of analogies of metaphors
What will we know about...?	Activation of previously acquired knowledge
How it does influence on...?	Activation of causal relations
How is...related to what we studied previously?	Activation of previously acquired knowledge
Explain why...?	Analysis
What is the sense...?	Analysis
Why is important...?	Analysis
What is the difference between the... and...?	Comparison-contrasting
In what are alike...?	Comparison-contrasting
How it could be used in every- day life?	Application in real world
What argument can you bring against...?	Contrarguments
Which argument is the best and why?	Its assessment and justification
What are the possible solutions of the task?	Synthesis of ideas
Make the comparison... and on the basis of...	Comparison-contrasting
What is the reason in Your opinion?	The causality analysis
Do you agree with the statement that...?	Assessment and its justification
How can You argue Your answer?	Assessment and its justification
How, in your opinion, ...would look...a question.?	Consideration of other view points

disciplines on separate logical modules of an interdisciplinary nature.

The second procedure is aimed at identifying of specific learning objectives for each module taking into account the objectives of forming of students' critical thinking.

The third procedure consists in establishing of the ratio of students' knowledge and levels of formation of competences of critical thinking (thus, low reproductive level requires from the student of an elementary knowledge of reproduction, and high creative level requires knowledge with high level of generalization).

The fourth procedure is the development of tasks for each student individually in accordance with the level of development of critical thinking.

4. DISCUSSION

The results of the study confirm the hypothesis that the formation of students' critical thinking belongs to one of the up to date didactic problems of higher education. This is due to the intensity and rapidity of information flows in various fields of knowledge that require from a modern student of sustainable intellectual capacity of critical thinking as a set of knowledge, abilities, skills, personal experience of knowledge's use in practical activities' kinds, which form the basis for a commitment to a competent and objective analysis of incoming information; the possession of knowledge and skills of critical analysis and synthesis of information from the standpoint of conformity to interests of personality, society and production, morality and moral values; goals are formulated of a critical approach to using of information; methods of implementation are projected; objective conclusions are developed about its relevance for vocational training.

To implement the stated objectives in the process of the conducted research, the complex of didactic trends is tested, effectively influencing the process of formation of critical thinking of students.

The productivity of the identified complex is confirmed experimentally by proven criteria:

- The willingness to plan their own learning - cognitive activities show (before the experiment - 15% of students after the experiment - 55%).
- Flexibility of thinking steadily is shown - (before - by 10% of students after the experiment - by 25%).
- The ability to generate unusual, innovative ideas are manifested by (before the experiment 8, 7% of students, after the experiment - 18%).
- Perseverance in achieving of the results show - (before the experiment - 9.6% of students, after the experiment - 28.7%).
- Focus on the opening of a new is manifested by (before the experiment - 8% of students, after the experiment - 28%).
- The ability to a deep understanding of their experience show (before the experiment -10% of students after the experiment - 30%).
- Willingness to correct their mistakes (self-correcting) demonstrate - (before the experiment - 10% of students after the experiment - 30%).

5. CONCLUSION

This study confirms the theoretical and practical significance of the research problem as the innovative direction in forming of critical thinking of university students. Based on the established complex of didactic tendencies, in the course of the study the classification of types of cognitive thinking of the individual was studied in detail; on this basis the structure and content of critical thinking as a specific form of intellectual activities of the individual and

the process of its formation, as a natural transition from didactic knowledge to a creative, interdisciplinary, transforming and self-transforming one; the peculiarities of the process of formation of students' critical thinking are revealed. This problem as a research direction has vast domestic resources for the enrichment of the theory and practice of teaching process of the University, oriented towards a new generation of future specialists' formation for the modern labor market, possessing scientifically based critical thinking.

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