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The Roles of University Teachers in the Process of Students' Critical Thinking Formation

Nailia Plotnikova*
Kazan (Volga region) Federal University, Kremliovskaya str, 18, 420008, Kazan, Russia

Eva Linyuchkina
Kazan (Volga region) Federal University, Kremliovskaya str, 18, 420008, Kazan, Russia

Abstract

The authors of the present paper investigated the problem of the importance of teachers' roles in higher educational institutions in the process of forming critical thinking among students. The ability to think critically allows future specialists to prepare for real professional activities, successfully implement assigned tasks to them and achieve high results. Similarly, there is an opinion among many researchers that students' critical thinking is formed automatically in the teaching and educational process. The research authors introduced their own views on the problem and considered the teacher personality as the central unit in the process of forming the critical thinking among university students.

Keywords: Students; Education; Competence; Critical thinking; Teaching.

1. Introduction

The investigation of issues relating to the formation of critical thinking as the basis of educational technologies of the 21st century can certainly be one of the highest priorities that originated at the intersection of psychology, pedagogy, philosophy and a number of other areas of scientific knowledge. One of the priorities of modern education is the development of constructive criticism and self-criticism as a means of effective thinking, self-knowledge and evaluation of the phenomenon of reality (Plotnikova and Kondrateva, 2018). The formation of critical thinking is necessary for a graduate of a modern university regardless of the specialty, but it is especially important for managers, teachers, psychologists, political scientists, doctors, marketers and engineers because critical thinking contributes to the development of effective solutions, the generation of ideas and the creation of new technologies in the sphere of their professional activity (Patamaporn and Panita, 2015), (Grebenyuk, 2000).

However, issues of university students' critical thinking formation are less investigated and not specified in the professional pedagogy. Therefore, future specialists cannot rationally formulate their thoughts and ideas, quickly navigate in the rapidly growing information flow and find required data, comprehend and apply the obtained information, as it requires the formation of special mental skills. They do not know how to make decisions whether to have children, whether to invest and whether to support any political proposal. They are not able to put forward probable solutions of their problems. In short, they do not know how to use their heads (Raven, 2002), (Aksenenko, 2001).

2. Literature Review

The conducted analysis of studies on this problem allows us emphasizing the relevance of the topic under consideration and to note the wide range of various definitions related to the notion of critical thinking.

The following definition of thinking is proposed the psychological dictionary (Hezrich, 1991). Thinking is the process of reflecting objects as well as the creative transformation of their subjective images, notion and meaning in the conscience of a person for resolving real contradictions in the circumstances of vital human activity, the formation of new goals, and the discovery of new means and plans to achieve them.

Critical thinking is a way of thinking with the aim to reveal structural features of reasoning, check the correlation between well-founded theses and the corresponding arguments, evaluate how theses put forward, characterize contexts of reasoning, take into consideration characteristics of author and readers, the opponent and the proponent (Veksler, 1973a).

Critical thinking is a mental ability aimed at finding the best way to solve problems. Training becomes effective only in case of self-learning which is the most lasting, persists for a long time and self-esteem serves as a support for it. Many authors defined the critical thinking as an evaluation based on certain criteria. It can be directed to the outside world and individual thoughts or to oneself and its thoughts. This is the content of criticality and self-criticality of thinking (Portnov, 1991). In Clarin (1994) the concept of "critical thinking" is viewed as "the process of solving a problem that includes a various discussion of the process and results of labor, their evaluation. This evaluation can be expressed in the detection of an error in establishing a positive, valuable quality of objects and phenomena, or in establishing the truth of the discussed fact or idea of Antúnez (2018) who define the concept of

*Corresponding Author

"critical thinking" as a person's comprehension of actions, thinking about them. In this regard, a person gives himself a full and clear account of what he does and how he does it, i.e. he is aware of those schemes and rules, in accordance with which he acts.

Analyzing current trends in the development of education, (Ilinichna *et al.*, 2017) points out the fact that a way beyond the rationalistic, intellectual understanding of critical thinking is clearly revealed in the characteristics of a propensity for the critical thinking. It is characterized by the search for a clear statement of the object of accuracy, consecutive, sequential consideration of parts of a complex whole; the manifestation of receptivity and understanding in relation to other people's feelings, the level of knowledge and depth of judgment; the propensity to apply the skills of critical thinking in life.

Critical thinking assumes the skill of reflection on one's own thinking activity, the development of analytical skills, the ability to work with concepts, judgments, inferences, questions, and the ability to evaluate the same skills in others. Critical thinking is formed as practical logics locating inside and depending on the context of reasoning and the reasoning subject (Gabriela, 2017).

Critical thinking is defined as [13] purposeful and self-regulating judgment leading to the interpretation, analysis, evaluation and opinion as well as explanations: the evidential, conceptual, methodological, criterial, contextual considerations on which this judgment is based.

According to Lau, the critical thinking is rational and clear thinking, which assumes "exact and systemic thinking accurate following rules of logics and scientific reasoning." Pussyrmanov *et al.* (2018) came to a conclusion that a critical thinker is the one who formulates the relevant questions, is able to accumulate relevant information, evaluates it in order to arrive at appropriate conclusions. Similarly, the picky critic is ready to accept alternative thought systems and communicate with others in order to find a common solution (Zarodin, 1999).

Since all of the above mentioned definitions are united by the fact that they link two separate elements of critical thinking - the skill of critical thinking (the ability to determine decisions, evaluate, etc.) and the psychological attitude (willingness to accept new ideas, concepts and points of view), Wright (Veksler, 1973b) proposed preserving the core of the original concepts used to determine critical thinking (Makhmutov, 1997).

However, the critical thinking is not purely a negative thinking. It strengthens the ability to become creative and constructive in order to generate possible explanations for findings, think about additions, and add new knowledge to a wide range of social and personal problems. A person cannot really detach creative thinking from critical thinking. If he can, then only when he can imagine what it can be (Petrovsky, 1976).

The ability to form the creative and critical thinking and to teach these types of thinking to students determines the level of professional competence of a teacher. Since we mention the term "competence", we consider it necessary to clarify our understanding of this concept. Competence is a kind of readiness for specific "answer" (responsible action, activity), universal ability to transfer knowledge, action in a new unfamiliar situation and conditions. Competence is a state of subjectivity development, connected with the culture of thinking, analytical reflection, independence and responsibility for decision making in organic unity with spiritual and moral values of personality. The process of professional competence development involves teaching various kinds of expertise that can be considered identical to skills based on both knowledge and experience of its application in different situations (Rubinshtein, 1991).

Formation of critical thinking skills requires a fairly long time and an extensive system of knowledge of students including the "knowledge that is given by formal education (school, university, advanced training courses, etc.) and knowledge obtained in the result of their own analytical work, reflection, critical attitude to their own experience and to themselves. Skill is the ability to consciously perform a certain action. It is the basis of craftsmanship" (Elder and Paul, 2010) and the professional competence of a future specialist. In the pedagogy, the skill is understood as the mastery of means of activity, and the ability to apply knowledge (Nor'AiniYusof, 2013).

As the critical thinking is an indispensable component of the teacher's professional competence, the interaction of a teacher with students and the interaction between students occur simultaneously in the process of directing the work of students into the stream of critical thinking. Students, being equal participants of the process, perceive learning as an exchange of experience between them and the teacher. The relations that develop between the teacher and the student free the teacher from the role of the know-it-all, but make him accept the equally difficult role of the organizer of the process of cognition (Rubinshtein, 1991). Rethinking of positions, which take place by a teacher, the teacher becomes more of a "coordinator" than a direct source of knowledge and information. The traditional paradigm of "teacher-student", i.e. the transfer of knowledge and experience, taking into account the individual traits of the trainee, is not capable of starting an internal "engine" of the person. Change in the professional position of the teacher leads to the fact that the student acts as a having a certain life experience "partner" in the learning process. Comprehension of wisdom and elicitation of learned lessons from the life experience occurs in the process of contact between the "coordinator" and the "partner". The learning process itself, i.e. the transfer of the relevant knowledge and experience to the student by the teacher and the reproduction of the personal qualities of the teacher by the students, happen at same time. The productivity of students' activities and, consequently, the effectiveness of the learning process itself depend on the way a teacher can teach students to think critically, provide perception, memorization, understanding, comprehension and other thought processes.

3. Methodology

The main research questions supporting this study are:

- What are university teachers' realization of critical thinking?
- What are teachers' realization of students' critical thinking?

- What are the roles of university teachers in the process of students' critical thinking formation?

The research questions led us to interpretive research methodology. In this method, the individual constructs personal meaning when they struggle with the environment around them to make it meaningful (Radnor, 2002), insinuating a requirement for an in-depth and insightful analysis of the data obtained. The aim is to view reality as being socially constructed where the behaviors of individuals are being continuously interpreted and reinterpreted to give a meaningful explanation to behaviors usually within a particular context (Holliday, 2002), (Radnor, 2002). The meanings obtained in this manner are actually conceptualized, temporary knowledge (Greene, 2000). The responses were categorized according to themes interpreted from the data.

4. Results and Discussion

The formation of critical thinking is the process of education and upbringing as a result of which such natural qualities of a person as curiosity, receptivity, self-confidence, independence, sociability, freedom of expression (looseness), boldness in expressing ideas are actualized and developed. Table 1 presents interrelations of the basic concepts, on which critical thinking are based, the qualities of the individual and skills that are formed when teaching to think critically.

Table-1. Interrelation of the Basic Concepts, Qualities of the Individual and Skills of Critical Thinking

Basic Concepts	Qualities of the Individual	Skills Necessary for Critical Thinking
Reflection	Curiosity Receptivity	To comprehend one's actions and understand the patterns and rules by which one acts
Criticism and criticality	Confidence Independence Sociability	Independently analyze one's beliefs, arguments for critical evaluation and correction (in front of the audience); self-assessment and self-correction; the ability to actualize one's own and others' personal qualities: curiosity, observation, tolerance, looseness, courage, tact, etc.).
Self-criticism	Looseness Boldness in expressing evaluation	Defend your beliefs and find answers to objections; analyze information, opinions for evaluation and validation; the ability to use scientific methods, principles and rules of logics (argumentation, proof, refutation)
Assessment and self-esteem	Tolerance Responsibility	Ability to organize control and self-control; ability to compare the final results and goals, objectives, plan of activity; ability to analyze the causes of non-compliance and own mistakes; ability to make decisions to eliminate inconsistencies in work
Estimated judgement	Tactfulness	Ability to compare, contrast, generalize, concretize someone else's and own opinion

Teachers working in line with critical thinking develop the content of all kinds of pedagogical situations, from the point of view of the possibility of strengthening the process of forming critical thinking of students using methods of forming problem thinking as well as special ways, methods and techniques. The productivity of students' activity, and consequently, the effectiveness of the educational process itself depend on the way a teacher can stimulate students' desire for tireless knowledge, teach students to think critically, provide perception, understanding, memorization, and other processes. Hence, the teacher's ability to think critically himself, involves the fulfillment of a number of important functions (Petrovsky, 1976).

1. Control function includes such speech actions as control of understanding, comprehension, application, implementation, expansion of students' knowledge, skills and proficiency, organization of self- and mutual control.

2. The appraisal and corrective function are represented by teacher' measures in assessing and correcting students' learning activities. The teacher is able to influence the emotional sphere of the trainees, create a certain psychological climate in the class, and regulate the educational process. This group is also represented by value judgments, marks, and the organization of self and mutual evaluation.

3. The stimulatory function. The teacher's measures aim at encouraging students to speech-cogitative activity through the formulation of problems, the question-answer form of interaction, the stimulation of internal motivation and cognitive interest.

4. The facilitative function is to provide meaningful teaching. It aims at coordinating actions with students, preventing errors, providing help and psychological mindset, stimulating the desire to learn and providing choices and freedom of actions in solving learning problems.

5. Informative function. By informing trainees, the teacher organizes and stimulates their activities by means of the material presented. If the information is problematic, then it directly contains the stimulating moments that motivate the learners to find answers and solutions to the questions posed.

Dealing with this problem, foreign researchers (Petrovsky, 1976) note the fact that teaching critical thinking to students allows them to use the obtained theoretical knowledge during seminars, trainings in real life, and distinguish the following stages in the realization of critical thinking:

- Problem definition;
- Systematic monitoring;
- Brainstorm;
- The beginning of the problem solution;
- Setting short-term goals;
- Argumentation based on qualitative indicators;
- Feedback and self-evaluation.

We agree with foreign researchers' points of view and believe that the implementation of critical thinking and, consequently, its formation to a certain extent is possible at all stages, wherever there is an alternative in analyzing the problem situation (analysis requires critical attitude).

5. Summary

Based on the study of stages and methods of forming critical thinking of university students, the authors of study developed a plan for the formation of critical thinking of students.

Objectives: formation of critical thinking of university students.

Tasks of critical thinking formation:

- Acquirement of knowledge of logical, problematic and creative thinking by students;
- Teaching students basic logical concepts: reflexion-negation-criticism-criticality-self-criticism-argumentation-proof-refutation-evaluation-self-esteem-evaluative judgment;
- The formation of students' ability to build critical judgments in the form of critical reasoning of a tolerant character;
- Teaching students to identify logical errors in the critical evaluation of the phenomenon, behavior.

Didactic conditions for students' critical thinking development:

- Determining conditions for the critical thinking development, taking into account the age and individual characteristics of students, the accumulated experience;
- Determination of the level of critical thinking formation;
- Familiarity with the logical structure and methods of critical attitude to various sciences;
- Use of critical thinking techniques by the teacher when presenting new teaching material;
- Fulfillment of tasks for students, including elements of critical thinking;
- The formation of generalized methods and techniques of critical analysis of statements in the course of solving group problems.

What does the teacher's activity consist of?

5.1. Course Content

1. Inclusion of matters requiring critical understanding by students in new academic topics.
2. Inclusion of various forms and types of criticism in the academic information and material proposed to team members.
3. Arrangement of group tasks and problems requiring that critical thinking is applied as a part of the training process in various subject areas.
4. Thematic distribution of the training session materials with the purpose of developing critical thinking in accordance with the tasks of developing critical thinking of team members.
5. Determination of the level of students' critical thinking.

5.2. Forms of Teaching

1. Use of critical thinking in group problem solving taking into account individual traits of team members.
2. Teamwork while solving problem-based and cognitive situations aimed at developing critical thinking abilities and skills.
3. Group work taking account of the distribution of roles among members of a team for the execution of tasks aimed at developing critical thinking.

5.3. Teaching Methods

1. Using rating systems to determine students' readiness to acquire teaching material and information, and choice of a pedagogical technology in accordance with the level of students' ability to learn.
2. Motivate students to critically comprehend the content of training sessions and cultivate a critical attitude toward statements and actions.
3. Establishing the level of development of critical thinking ("low", "middle", and "high") within the structure of pedagogical technology.
4. Using problem-based training technologies: problem-based reasoning method, heuristic method (*ad absurdum* method, exclusion of superfluous data, and reliability assessment of a source of information), research method, dialogical method, methods to motivate students to perform logical tasks on their own using critical thinking techniques, i.e. anytime a question arises: "What if?", "What's that?.

5. Using the logical method (analysis, synthesis, comparison, generalization).
6. Using the reflexive, problem-based and critical thinking method as well as inductive and deductive inferences.

6. Conclusions

Critical thinking is definitely formed by the logics of life. It depends on natural abilities and inclinations, social environment and social education. Nevertheless, the main role in the formation of critical thinking belongs to teachers. The main prerequisite for the inclusion of critical thinking in the curriculum is that the education is not given by the teacher and it is achieved by students themselves.

6.1. Conflict of Interest

The author confirms that the presented data does not contain any conflict of interest.

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