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TECHNIQUES AND FACTORS CONTRIBUTING TO DEVELOPING CRITICAL THINKING SKILLS

Abstract. The paper deals with the issue of working out and introduction in educational process of higher educational institutions of the innovative technology for developing skills of critical thinking skills of the future specialists.

Research is aimed at revealing of the factors promoting formation of students' critical thinking in high schools; the search of strategy and the receptions actualizing creative abilities of students and helping to formation of an active, independent person. The author gives the reasoned proving that it's necessary to set up the creative educational environment and adjustment of positive dialogue between the teacher and the trainee for education of such person, development of abilities of an objective reflection, interpretation of the phenomena, formulations of adequate conclusions, well-founded evaluating.

Methods. The methods involve the analysis of the philosophical, psychology-pedagogical, methodical literature and the scientific periodical publications; generalisation of the Russian and foreign background, classification and arrangement of the considered issues, supervision.

Results. Current approaches to the rendering of critical thinking and a problem of its formation in the scientific literature are considered; the concept «the creative educational environment» is specified; the ways of increasing the educational process efficiency are shown.

Scientific novelty. The complex of procedures and the conditions promoting effective development of critical thinking skills is theoretically proved on the basis of the analysis of various information sources.

Practical significance. The research outcomes and the recommended methods of critical thinking skills formation can be useful for the professors and lecturers of higher education institutions to optimize subject matter selection, techniques and methods of education under the conditions of dynamically updated educational process.

Keywords: critical thinking, critical thinking skills, creative learning environment, a dialogue approach, the case interrupted method, a negotiation model, pro and con grids, questioning tactics, a Socratic questioning.

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ПРИЕМЫ И ФАКТОРЫ РАЗВИТИЯ НАВЫКОВ КРИТИЧЕСКОГО МЫШЛЕНИЯ

Аннотация. Статья посвящена проблеме разработки и внедрения в образовательный процесс высших учебных заведений инновационной технологии, развивающей навыки критического мышления будущих специалистов.

Цели исследования. Выявление факторов, способствующих формированию критического мышления у студентов вузов; поиск стратегий и приемов, актуализирующих творческие способности учащихся и помогающих становлению активной, самостоятельной личности; аргументированное доказательство того, что для воспитания такой личности, развития умений объективной рефлексии, интерпретации явлений, формулирования адекватных выводов, вынесения обоснованных оценок необходимы прежде всего создание креативной образовательной среды и выстраивание позитивного диалога между преподавателем и обучаемым.

Методики. В работе использовались анализ философской, психолого-педагогической и методической литературы, научной периодики; обобщение отечественного и зарубежного опыта, систематизация изучаемых явлений, наблюдение.

Результаты. Рассмотрены существующие в научной литературе подходы к трактовке критического мышления и проблеме его формирования; уточнено понятие «креативная образовательная среда»; показаны способы повышения результативности учебного процесса.

Научная новизна. На основе анализа различных источников теоретически обоснован комплекс приемов и условий, способствующих эффективному развитию навыков критического мышления.

Практическая значимость. Материалы представленного исследования технологического обеспечения процесса формирования критического мышления у студентов позволят преподавателям высших учебных заведений оптимизировать отбор содержания, форм и методов обучения в условиях динамично обновляющегося образовательного процесса.

Ключевые слова: критическое мышление, навыки критического мышления, креативная образовательная среда, позитивно направленное диалогическое взаимодействие субъектов образовательного процесса, метод анализа конкретных ситуаций, токсономия вопросов, доводы «за» и «против», дискуссия.

The great amount of available information today is massive due to modern technologies. This information is likely to continue in the future. Therefore, students need a guide to weed through the information and not just passively accept it. On the other hand, university and school graduates have to meet changing employment demands as modern society faces new challenges. So they need a composition of skills and attitudes that will enable them to blend in the job market. As H. Oliver and R. Utermohlen [20] claimed, students need to develop and effectively apply critical thinking skills to their academic studies, to the complex problems that they will face, and to the critical choices they will be forced to make as a result of the information explosion and other rapid technological changes.

It is the responsibility of teachers and educators to understand the components of this set of skills and focus on them in order to guarantee effective education. Critical thinking skills should be given priority as they create a meaningful learning process and help students succeed in an academic environment and everyday life.

The concept of critical thinking is not a new one. The word «critical» derives from two Greek roots: «kritos» (meaning discerning judgment) and «kriterion» (meaning standards). Etymologically, then, the word implies the development of «discerning judgement based on standards».

Critical thinking cannot be easily defined, while it ranges across all disciplines and can be perceived across a lot of logical, ethical, pedagogical and epistemological issue raised in a specific context [4].

There are a few approaches to understanding critical thinking in philosophy. One of them is didactic which considers critical thinking as a school subject which teaches how to analyze and acquire knowledge beyond professional environment. Students learn *how*, *when* and *why* conclusions are made.

A. N. Shuman [25] suggests another approach to critical thinking. He views it as a set of argumentative-logical tools like general schemes that can be filled with a particular content relating to this or that problem. Such schemes regulate written and spoken argumentation beyond concerned issue. It is quite obvious that critical thinking can be considered as the basis for creative thinking because new ideas are generated when you criticize the old ones. Systematic character, comprehensiveness, consistency, multiperspective and simplicity are essential features of critical thinking.

There is also a structural approach to understanding critical thinking: it is a sequence of mental actions aimed at checking a statement. Critical thinking is opposite to dogmatic thinking which agrees with some facts, theories, norms or values as fixed ones. Search of nonconformities and arguments justifying these nonconformities are the components of critical thinking [6].

All these approaches do not contradict each other. They describe a person who is engaged in the thought process, who does not only evaluate, analyze and interpret the information but also analyzes inferences and assumptions made regarding that information.

B. Lahey, L. Lefton, R. Malott, R. Plotnik and other psychological theorists view critical thinking as thinking about and evaluating our thoughts, feelings and behaviours so that we can clarify and improve them. E. Glaser [29] argued that critical thinking involves a willingness to thoughtfully consider problems rather than reach compulsive conclusions. It involves logic and mathematical reasoning. Finally, critical thinking involves skill that can increase over time. In addition, the process of critical thinking requires certain psychological dispositions that you can practice. These definitions suggest that critical thinking is a learned skill. It is methodical, it is thought out, not random.

However, educational theorists from different disciplines consider the content of thinking as a human characteristic and the kinds of cognitive skills that can be developed during the course of a life time. They view critical thinking as a combination of either abilities and dispositions. Diane F. Halpern [12] posits the following definition of critical thinking: «Critical thinking is the use of those cognitive skills or strategies that increase the probability of a positive outcome. It is used to describe thinking that is purposeful, reasoned and goal directed – the kind of thinking involved in problem solving, formulating inferences, calculating likelihoods, and making decisions when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking task. Critical thinking also involves evaluating the thinking process – the reasoning that went into the conclusion we have arrived at the kinds of factors considered in making a decision. Critical thinking is sometimes called directed thinking because it focuses on a desired outcome».

It has been shown that critical thinking has varied definitions depending on various contexts. But there are some aspects of the term common to many sources and there are some characteristics unique to various disciplines.

It is obvious that effective developing of critical thinking skills in students should be supported. Our research focused on the factors that can facilitate critical thinking. First, it is creative learning environment. Based on the definition of creativity as the production of novel ideas that are useful and appropriate to the situation [1; 18] we view creative educational environment as the one that motivates learners to make a free choice how to behave in interaction with others; the environment where thinking, questioning and imagining are encouraged and are critical.

There are many studies (T. M. Amabile, K. G. Hill, A. G. Richardson, S. T. Shatsky, M. F. Shaughnessy, L. S. Vygotsky) that indicate how environment can affect people's state of mind. The environments that encourage in-

dependence, risk-taking and intrinsic motivation appear to be more conductive to creativity. People who are relaxed, comfortable and positively stimulated are known to be more creative and innovative. Based on Meyers' study [16] four elements have to be present: stimulating students' interest; creating meaningful discussion; exposure to thoughts and views of others and fostering a trusting and supportive atmosphere. B. Scott [23] argued that positive climate can create an atmosphere in which creativity and innovation flourish, whereas a negative one can squash such efforts.

We undertook a literature review and found out that the structuring of physical environment had an impact on learners. Flexible use of space, free movement around the space, providing a wide range of tools and resources (games, whiteboard, computer games, etc.), working in an outdoor environments (museums, galleries) are very effective. Among suggested activities to promote creativity are the following: experimentation with new media technologies; ICT (information and computer technologies) such as the interactive whiteboard and computer games; brainstorming; mind mapping; walking backward strategy; role playing.

We suggest that the nature of the relationship between teachers and learners is another supportive factor that can facilitate developing critical thinking skills in learners. Dialogue appears to be a key element to the pedagogical relationship. This means mutual respect, flexibility, freedom and open-ended possibility. There is research evidence (A. W. Astin, M. Carter, J. Flemming, E. T. Pascarella, P. T. Terenzini) to support the importance of this factor. Through discussion and dialogue both individuals, the teacher and student are better able to understand and grasp a particular problem. Disagreement should be based on logic and fact, not on personal bias. «When teachers are respectful of unusual questions, respectful of imaginative and unusual ideas, show [students] that their ideas have value, occasionally have pupils do something «for practice» without the threat of evaluation, and tie in evaluation with causes and consequences» immediate feedback will have the most impact [28].

Recently researchers (P. Facione, N. Facione, C. Giancarlo, R. Ennis, S. Norris, G. Salomon), have begun to investigate the relationship between the disposition to think critically and critical thinking skills. John Dewey, the American philosopher, psychologist and educator, who is regarded as the father of the modern critical thinking tradition, believed possession of knowledge does not guarantee the ability to think well but an individual must desire to think. One needs open mindedness, wholeheartedness and responsibility to develop the habit of thinking [9].

Educational theorists agree that the student's disposition to think critically is a major factor. So students should be encouraged to be inquisitive, ask questions and not believe everything they are told. As pointed out by G. Loving, J. Wilson and J. Oermann [15; 19], thought develops with practice and evaluation over time using multiple strategies.

There are a few questioning techniques to provide training for those students who do not possess the thinking skills to analyze and synthesize information. Questions should be designed to promote evaluation and synthesis of facts and concepts. Depending on how a question is asked, a student may use various critical thinking skills such as interpretation, analysis and recognition of assumptions to form a conclusion.

B. S. Bloom, J. L. Craig, M. Duke, J. Mills, G. Page, N. B. Phillips have found that highly professional teachers asked more higher-level cognitive questions than lower-level questions. Higher-level thinking questions start or end with words such as «explain», «compare», «why», «which is the solution of the problem», «what is the best and why», «do you agree or disagree with this statement». Due to them students can be challenged at different levels of cognition.

Another type of questioning technique is Socratic questioning. R. W. Paul and P. Heaslip [21] define it as a type of questioning that deeply probes or explores the meaning, justification, or logical strength of a claim, position or line of reasoning. Questions are asked to investigate assumptions, viewpoints, consequences and evidence. The focus is clarification. A student's answer to a question can be followed by asking a fellow student to summarize the previous answer. Summarizing the information allows the student to demonstrate whether he or she was listening, had digested the information and understood it enough to put it into his or her own words.

Avoiding questions with one set answer allows for different viewpoints and encourages students to compare problems and approaches and creates a trusting and supportive atmosphere. Asking students to explain how the high school and the university field experiences are similar and different is an example. There is no right or wrong answer because the answers depend upon the individual student's experiences. Regardless of the answer, the student must think critically about the topic to form a conclusion how the field experiences are different and similar [19].

Meaningful discussion is one of have to be present elements in creative learning environment. Various techniques are available. D. A. Bernstein [3] developed a negotiation model for thinking about controversial issues. It is based on the method described by Fisher's and Ury's book «Getting to «Yes». A negotiation model gives students a framework for managing conflicts. Students analyze and evaluate competing arguments on an issue, e. g. «Is intelligence determined primarily by inheritance or experience»? Then students have discussions about arguments themselves and about the general issues. Then they are asked to write a paper in which they choose and defend one of several alternative public policies. Students are challenged to deal with the tension between two arguments. This tension is believed to be one component driving critical thought.

Another strategy to promote students to search for at least two sides to an issue is pro and con grids. Students make a list of advantages and disad-

vantages of any issue. It can be used in any discipline: students evaluate the pros and cons of a procedure, technique, conclusion, action of a fictional character, political decision, etc. This can be facilitated as an individual exercise or in groups and considered as the basis for a debate. Students learn to base their opinion on logic and fact not prejudice and personal bias.

The interrupted case method is an active learning strategy that has great potential for the development of critical thinking skills. A teacher gives students who work in groups a problem faced by professionals or experts. Students work for fifteen minutes and report their ideas. Then the teacher provides some additional information about the problem saying that experts who struggled with the problem decided to do it in a certain way. The teacher tells about additional difficulties and asks students to brainstorm solutions. Again, they report after discussions. Then, perhaps the teacher provides additional data for their interpretation. Students consult with their teammates and report out. Again, the teacher gives them the interpretation offered by the original authors, etc.

The interrupted case method is designed to enhance understanding of core concepts of the course as well as to encourage critical thinking and stimulate students' interest. In using cases, students become active. It is learning by doing. Cases provide students with the opportunity to exercise decision making, whether individually or in a team format [13].

To sum up, creative learning environment and a dialogue approach can facilitate the effective developing of critical thinking skills of students. A few supportive techniques (questioning techniques, a negotiation model, pro and con grids, the interrupted case method) should also be provided. As the current study was framed with the purpose of determining factors contributing to developing critical thinking skills, this paper presents the pretest results of the research. As theoretical considerations offer no answer how effective creative learning environment and a dialogue approach in classroom activities can influence developing critical thinking skills, further research should find out empirical data for these suggestions and explore dynamics of achieving different levels of critical thinking in students. This study would also benefit from the research on student's impact on shaping the learning environment and their individual needs for developing critical thinking skills.

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