

CRITICAL THINKING AS EDUCATIONAL CHALLENGE

Assoc. Prof. Ľubica Predanocyová, PhD.¹

Assoc. Prof. Gabriela Jonášková, CSc.²

^{1,2} Constantine the Philosopher University, Nitra, Slovakia

ABSTRACT

Critical thinking currently represents the necessary ability of an individual to orient himself in a world full of information, it allows him to search for his own identity, to form his own opinions, attitudes. Critical thinking is an individual intellectual process in which the thinker improves and cultivates the quality of his thinking, activating himself in the assessment of actions, various situations. The paper will present current theoretical approaches to understanding critical thinking and its position, we will also introduce critical thinking as one of the necessary human competencies acquired in the educational process. The paper will present the results of research by a team of experts at Constantine the Philosopher University Nitra, focused on the development of critical thinking in the educational process, which is part of the undergraduate training of future teachers and its subsequent implementation in educational practice.

Keywords: critical thinking, education, competence

INTRODUCTION

Nowadays, critical thinking is becoming important due to the fact that the world is full of information and for people it is necessary to be able to orient themselves in it. Critical thinking is a rich concept that has been evolved by 2,500 years, and is not an universal approach, because each individual gets into problems and has to solve them on his own. Responding to the challenges of the 21st century with environmental, social, economic problems requires that young people have to be creative, innovative, adaptable, and skilled, so they will be able to critical think. A critically and systemically thinking individual uses his thinking in a wide range of socio-cultural and economic contexts. No one automatically becomes a critical thinker, so critical thinking has an irreplaceable place in the educational environment and its aim is to encourage pupils to use their own opinion, develop their curiosity, realize the importance of their knowledge, and develop skills. The disposition of critical thinking is the result of a lifelong effort.

One of the main topics of the World Economic Forum, which was held in 2016, was the management of the fourth industrial revolution, which brings significant changes in the labor market in the field of human resources. Changes determine the most important skills of the workforce and in the report "Future Jobs" is listed the 10 most important skills required for 2020: comprehensive problem solving, critical thinking, creativity, people management, coordination with others, emotional intelligence, judgment and decision making, service

orientation, negotiation, cognitive flexibility [1]. Critical thinking, as the second most important, requires relatively rapid shifts in education or improving skills. Critical thinking, as the second most important, requires relatively rapid shifts in education or improving skills. In the context of critical thinking, the skill of creativity plays an important role. In the context of the mentioned, it is possible to assume human abilities that support flexibility towards mastering new technologies and new working procedures.

The ability to think critically must be understood as one of the key competencies of the 21st century. The research project Practice in the center of subject field didactics, subject field didactics in the center of preparation for practice, implemented by a team of experts from UKF in Nitra (2017-2020), focuses on research aimed at identifying adaptive teaching strategies based on cognitive oriented approach for the development of critical and creative thinking and their application in pedagogical practice.

THEORETICAL BASIS OF CRITICAL THINKING FOR EDUCATIONAL PRACTICE

Defining the issue and conceptualizing critical thinking are problematic because they depend on arguing the basis of critical thinking. Nowadays, there are several theoretical approaches and the paper points out some of them.

Representatives of the philosophical approach identify the characteristics of the critical thinker, present the philosophical construct of the ideal thinking person. Enis (1985) points to reflexive and rational thinking as an ability focused on what to believe or what to do [2]. Self-regulatory judgment is the result of Facione's thinking and leads to the interpretation, analysis, evaluation and conclusions, as well as to the explanation of the evidence, concepts, methodologies, criteria and contextual considerations upon which the judgment is based [3]. Bailin emphasizes his own opinion that critical thinking is thinking about something certain, it is quality thinking that meets specified criteria or standards of adequacy and accuracy [4].

Representatives of the cognitive-psychological approach, including Halpern (1998) [5], Williams (2003) and Ruisel (2008), concluded that critical thinking can be defined as the mental processes, strategies, and representations that man uses to problem solving.

From the point of view of the solved issue in our paper, the pedagogical or educational approach is the most relevant. The mentioned approach is oriented on educational results, which are systematically reflected in the taxonomy of educational objectives. These are a tool for observing and evaluating the thinking of pupils.. The taxonomies of S. W. Bloom (1998) [6] and M. Kennedy (1991) [7] have been considered as the most elaborated so far.

The consensual definition of critical thinking was created for the purpose of evaluating the results of education. Critical thinking is defined in terms of deliberate, regulated reasoning, which is based on consideration of evidence, concepts, methods, criteria, and contexts aimed at analysing, interpreting, evaluating, and formulating conclusions. Critical thinking is standardly defined by two dimensions: cognitive competences (interpretation, analysis, evaluation, reasoning, explanation, self-regulation) and personality dispositions (interests, awareness, self-judgment, acceptance of alternatives, consideration of conclusions, willingness to reconsider own opinions).

The result of the implementation of cognitive competences and personality dispositions is the creation of a model of critical thinking (Simpson, Courtney), consisting of four dimensions and associated variables.

Table 1 Model of Critical Thinking. Source: Simpson, Courtney, 2007, 57 [8].

DIMENSIONS	VARIABLES
Cognitive skills	Analysis, interpretation, conclusion, explanation, evaluation, self-regulation.
Dispositional skills	Open mind, curiosity, analytics, systematics, self-confidence, thoughtfulness.
Strategies	Question, group work, role playing, discussion.
Criterion	Clarity, accuracy, relevance, depth, fairness, logic, completeness.

Critical thinking is the ability to analyze using thinking and presenting evidence for one's own thoughts, and not just simply accepting personal justification as sufficient evidence. By mastering the skills of critical thinking, an individual can gain many benefits, such as better control over their own learning and empathy for other aspects.

EDUCATION - AN ENVIRONMENT FOR CREATING AND DEVELOPING CRITICAL THINKING

The company is currently in crisis and its biggest threat is the loss of the ability to think. Therefore, it is realistic to expect that the school will be a space for the development of systemic and critical thinking of individuals. This generates many questions as well as the need for a change in education, preceded by a paradigm shift. Nowadays, however, we cannot prepare the young generation for specific future occupations, as we cannot anticipate the requirements of a rapidly changing practice. Therefore, we face the challenge of directing school preparation to master the current required individual skills, in which critical thinking is dominated.

Current education is still based on the repetition of knowledge provided by teachers. In a time of continual innovation, huge number of scientific discoveries

and new technologies, the teacher discontinues to be the dominant source of knowledge and it is necessary to look for another space to realize the relationship between him and pupils, leading to permanent, systematic and practical knowledge of learners. The critical situation at the time of the pandemic (2020), caused by COVID 19, showed the need for significant changes in Slovak education not only in the reconstruction of content. However, it was clearly shown that despite efforts to flexibly implement various methods of online education, the teacher's personality, his work, personal contact and influence on the pupils are irreplaceable in education.

Considerations relating to importance of human critical thinking as well as ways of its creating and developing are intensively confirmed in real life, therefore the establishment of critical thinking in the educational environment appears as one of the basic individual abilities and competencies. The research, realized in the conditions of the Slovak Republic in the period of 2017 within the research project *APVV Practice in the centre of the subject field didactics, subject field didactics in the centre of preparation for practice*, was focused on identifying strategies applying cognitively oriented approach to critical and creative thinking. The results of the research were analyzed and their evaluation led to the identification of six key strategic approaches for the development of critical thinking in education. Specific strategies have been identified for each strategic approach.

Table 2 Strategies applying cognitively oriented approach to the development of critical and creative thinking. Source: own processing.

<p style="text-align: center;">KEY STRATEGIC APPROACHES FOR THE DEVELOPMENT OF CRITICAL THINKING</p>	<p style="text-align: center;">CRITICAL THINKING STRATEGIES</p>
<p>Strategies for the development of self - regulation</p>	<p>Creating a space for self-presentation and presentation of pupils' own solutions; creating a space for the presentation of different opinions, attitudes and cultural differences among pupils; using discussion as a tool to explore pupils' own feelings and perceptions; application of small-group teaching methods; creating space for pupils' discovery, curiosity and inquiry; application of problem-based learning; use of similarities and analogies; application of project-based learning; preference for tasks with more correct solutions.</p>

<p>Strategies for the development of systematic and interpretive skills</p>	<p>Leading pupils to deduction and concretization; use of comprehension procedures; use of memorization procedures; leading pupils to summarization and interpretation of the curriculum; preference for cognitively more difficult tasks; use of categorizations; use of associations; identification and definition of basic concepts and relationships by teachers; leading pupils to creation of original ideas, solutions and products.</p>
<p>Argumentation strategies</p>	<p>Use of contradictions; leading pupils to argumentation; leading pupils to identify differences between fact and opinion; leading pupils to the graphical representation of the curriculum (concept maps, handout, tabular, graphical representations); leading pupils to assess the credibility of the resource; leading pupils to the application of the curriculum in unusual situations and tasks; application of role-play teaching method.</p>
<p>Strategies for formulating conclusions and solving problems</p>	<p>Use of various teaching aids except of the pupil's book; leading pupils to formulate conclusions and generalizations; respecting interdisciplinary relationships; use of debate in teaching (leading to the creation of analyzes and arguments); leading pupils to the formulation of questions supporting their own thinking (questions such as: What is the point? What does it mean? Why is it happening? What if? etc.); creating a space for the presentation of pupils' ideas and their confrontation as well as improvement; problem identification; problem solving and suggesting conclusions.</p>
<p>Strategies for developing evaluation</p>	<p>Leading pupils to identify key and relevant facts and ideas in the curriculum; leading pupils to identify cause and effect; asking questions aimed at repeating the memorized curriculum; structuring the curriculum based on defined aims according to specific taxonomies.</p>
<p>Strategies for the development of reading skills</p>	<p>Use of digital learning materials, programs and applications; use of graphic representations in the presentation of the curriculum (concept maps, handout, table, graphic representations); leading pupils to working with text and creating their own notes; creating presentations and supporting teaching materials for pupils.</p>

Another intention and step of the research project is the subsequent implementation of the identified strategies into the process of undergraduate teacher training in the context of specific subject didactics. Thus, teachers will be gradually prepared to develop the competence of pupils' critical thinking at the level of primary and secondary education [9].

COMPETENCE TO THINK CRITICALLY

The importance of critical thinking for pupils is reflected in the ability to select information and evaluate it based on rational reasons. The pupil looks for or should look for reasons, arguments and evidences, which may be statistical data, places in the text, personal experiences or other evidence that can be considered as valid by addressees (Bean, 2011) [10]. Moreover, it is necessary to point out the fact that most of the pupils' knowledge is acquired without independent or self-corrective thinking. The complex of strategies for the development of critical thinking is aimed at the development of pupils. The complex of strategies for the development of critical thinking is aimed precisely at the development of pupil's competencies, thanks to which the pupil becomes an autonomous personality in thinking, attitudes and value preferences.

Pupil's competencies represent a set of demonstrable individual abilities to use knowledge, skills, attitudes and values to achieve personal development, professional development, and application in working and non-working life. Key competencies of pupils in the Slovak Republic are defined by the Education Act (Act No. 245/2008 Coll.) and the State Educational Program at various levels of education. Competence of critical thinking is one of the key competencies and is a prerequisite for independent logical thinking and subsequently leads to independent creative suggestions, which are argued, presented and defended by the pupil [11].

Current requirements of education in connection with the needs of social practice are also possible through the implementation of identified key strategic approaches and specific strategies for the development of critical thinking. Strategies are a way to support and develop pupils' critical thinking competencies.

The complex of methodological approaches must reflect the requirement of integrity of knowledge. Education should respect several requirements aimed to apply the individual in life. The requirements are related to the work of the teacher and his ability to lead and inspire pupils to critically assess the stimuli. We identify some of the requirements: (a) cognitive level: development of basic cognitive processes, validity of information, functionality of information in the context of individual areas of cognition, concentration on essential information; (b) activity level: students' focus on educational activities, completion of educational activities, elimination of multitasking, cognition by action; (c) social level: development of social interaction, support of curiosity through cooperation, communication, question creation, solving everyday situations.

CONCLUSION

Nowadays, people discontinue thinking critically, perform a large number of repetitive activities, receive information uncritically and superficially, as well as they are unable to process it further and lose their sense of detail and become passive recipients of ideas, instructions. The presented research project *Practice in the centre of the subject field didactics, subject field didactics in the centre of preparation for practice* has the ambition to show the real possibilities of developing critical thinking and implement them through the preparation of future teachers in educational practice. The ambition of the team of experts is to achieve that the identified key practices will be implemented by teachers into specific subjects [12].

The use of individual strategies of critical thinking in teaching methods is a prerequisite for real stimulation of pupils to develop their self-regulation, systematic and interpretive skills, evaluate and solve problems, formulate conclusions and other partial competencies, leading to the ability to think clearly and rationally [13]. Critical thinking is an important prerequisite for a person to be able to perceive the causes and consequences of phenomena, to anticipate how things will develop. The ability to perceive connections is a part of the mentioned thinking. This type of thinking is an important part of everyone and its application in social and working life.

ACKNOWLEDGEMENTS

This work was supported by the Slovak Research and Development Agency under the contract No. APVV-15-0368.

REFERENCES

- [1] World Economic Forum. In: <https://www.weforum.org/agenda/archive/davos-2016/>.
- [2] Ennis, R. H. A logical basis for measuring critical thinking skills. *Educational Leadership*, vol. 43, n.2, 1985, pp. 44–48.
- [3] Facione, P. A. *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction. Reserch Findings and. Recommendations*. Newark: APA, 1990.
- [4] Bailin, S. Critical thinking and science education. *Science & Education*, vol. 1, n. 4, 2002, pp 361–375.
- [5] Halpern, D. F. *Trought and Knowledge. An Introduction to Critical Thinking*. (5 ed.) New York, London: Taylor & Francis, 2014.

[6] Facione, N.C. – Facione, P.A. – Bloom, S.W. – Howard, K., - Giancarlo, C. A. The California Critical Thinking Skills Test (CCTST): forms A and B and test manual (revised ed). Millbrae CA: California Academic Press, 1998.

[7] Kennedy, M. – Fischer, M. B. – Ennis, R. H. Critical thinking: Literature review and needed research. In L. Idol & B.F. Jones (Eds.), Educational values and cognitive instruction: Implications for reform. Hillsdale, New Jersey: Lawrence Erlbaum & Associates, 1991, pp. 11-40.

[8] Simpson, E. – Courtney, M. The development of a critical thinking conceptual model to enhance critical thinking skills in middle-eastern nurses: a middle-eastern experience. Australian journal of advanced nursing, vol. 25, n. 1, 2007, pp. 56 -63.

[9] Duchovičová, J. – Tomšík, R. Critical and Creative Thinking Strategies in Teaching Internal consistency of the research tool. Slavonic Pedagogical Studies Journal, ISSN 1339-8660, Volume 6 Issue 2, September 2017, 2017, pp. 1-20.

[10] Bean, J. Engaging Ideas : The Professor's Guide to Integrating Writing, Critical Thinking, and Active Learning in the Classroom. 2 vol. San Francisco : Jossey-Bass, 2001, 384 p.

[11] Školský Zákon č. 245/2008 Zb. o výchove a vzdelávaní o zmene a doplnení niektorých zákonov. [online]. Dostupné: <https://www.vedatechnika.sk/SK/VedaATechnikaVSR/Legislatva/245_2008_skolsky_zakon.pdf>.

[12] Feszterová, M. Vzdelávanie budúcich učiteľov chémie : rozvoj nových vedomostí a zručností. In: XXXII DIDMATTECH 2019 : New Methods and Technologies in Education and Practice. International Scientific and Professional Conference, Trnava, 20th - 21st June 2019. - Trnava : TU, 2019. - ISBN 978-80-568-0398-1, pp. 1-6.

[13] Gadušová, Z. - Jakubovská, V. – Predanociová, Ľ. Teacher's Ability to Develop Learner Personality and Their Competences - Pilot of Instruments for Its Evaluation.

In: INTED 2019 : The 13th annual International Technology, Education and Development Conference, will be held in Valencia (Spain) on the 11th, 12th and 13th of March, 2019. - Valencia : IATED Academy, 2019. - ISBN 978-84-09-08619-1. - ISSN 2340-1079, pp. 3689-3695.