



Effectiveness of developing critical thinking at humanities electives in higher educational institutions

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ABSTRACT

The aim of the article is to prove the effectiveness of pedagogical conditions of humanities electives in the development of students' critical thinking. Methods. The Astin's I-E-O Model is used for the peer-review method. The coefficient of determination was used for multiple regression. Results. Students who studied the humanities electives had a deeper understanding of their own critical thinking. The results of regression analysis show that the level of development of critical thinking changes without controlling teaching methods and student characteristics. The study established the effectiveness of elective humanities courses in forming students' critical thinking. The coefficient of determination of the proposed model is 0.2. Conclusions. The obtained results of the study gave ground for drawing an unequivocal conclusion about the effectiveness of the pedagogical conditions of electives in the development of critical thinking of students of higher education institutions (HEIs). Prospects. Further research should be aimed at finding optimal conditions for the development of critical thinking in higher educational institutions.

Keywords: specialized training, critical analysis, modern education, building consciousness, anthropocentrism.

INTRODUCTION

Relevance

The recent trends require HEI graduates not only to have professional competences, but also to master the strategies of critical analysis of social and work processes. That is why critical thinking is important for the person himself/herself in his/her private and public life, and for making decisions at work. It is well-known that people who think critically are able to make more informed decisions, behave less prejudiced, and are disposed to heuristic thinking (Kuzemko, 2021). They are more informed and active citizens, so the task of higher education is to actualize critical thinking competencies (Sorina, 2018).

The critical thinking development is directly related to acquiring humanitarian knowledge. In modern higher education, this problem is resolved through the humanities electives, which can be both interdisciplinary and narrowly specialized. It should be noted that the primary educational courses of the humanitarian cycle for the formation of critical thinking are Fundamentals of Philosophical Knowledge, History of Ukraine, Sociology, and Political Science. It is during the study of these academic disciplines that students' critical thinking is actualized. They must find logical connections, draw conclusions, summarize information, and form opinions. The main purpose of organizing electives is to meet the individual educational needs of each student (Bayram, 2019). The problems of the implementation of the elective course are substantive problems that can be resolved by clarifying the content and determining the curriculum for specific profiles. Defining a set of electives in a specific profile is the way to solve this problem. In other words, the solution to the problem is to provide teaching materials for the educational process. It should be noted that the courses are an inseparable component

of the variable part of the educational process and its humanitarian component, which ensures students' successful self-determination (Kolossova, 2022).

The term "critical thinking" was one of the key terms in the philosophy of the 20th century. Dewey (1933) was one of the first to make attempts to interpret the concept of critical thinking. The author does not introduce the concept itself, but his idea of reflective thinking is now equated with critical thinking. According to the author, reflective mental activity is based on two components:

- a state of some hesitation, doubt in solving the problem;
- the process of finding facts that confirm or refute an idea.

All knowledge is human. It is always mixed with mistakes, prejudices, dreams and hopes. The only thing a person can do is to seek the truth by finding mistakes and eliminating them. The mistakes are found and eliminated by criticizing theories and assumptions. A person can criticize his own ideas or other people's ideas. In any case, the formulation of hypotheses and theories in a form accessible to criticism is the starting point for seeking truth (Radchenko & Vykhor, 2022).

However, the researchers' focus is the Higher School as a source of developing critical thinking of educated youth. Besides, critical thinking begins to develop in adolescence and reaches its maximum value after the age of 25, which is probably related to the accumulation of experience by a person (Mudra & Mudryi, 2022). This is one of the reasons for the increased interest in the development of critical thinking among HEI students.

The critical thinking components for inclusion in the framework of the assessment tool were selected on several grounds. First, critical thinking was considered in relation to working with information. Second, three main approaches were distinguished taking into account that the authors' definitions differ depending on the field of their activity: philosophical, psychological and pedagogical (Sliusarenko, 2021).

Philosophy considers critical thinking from the perspective of logic, and emphasizes that it is a reflexive, independent phenomenon of consciousness. Psychology uses different grounds depending on the tradition the author adheres to. Sometimes critical thinking is viewed from the perspective of cognitive abilities. Representatives of behaviourism include specific actions of a person with developed critical thinking in the definition. Pedagogy includes several components in critical thinking: analysis, synthesis and evaluation (Lee, 2018).

The study of the conditions for the development of critical thinking is based on the principles formulated by Dewey (1933):

- using constructivist practices, namely active learning methods;
- shifting the emphasis from knowledge of the content to the development of thinking when evaluating the students' performance;
- develop the teachers' competences that promote the development of thinking.

The principles formulated by Dewey are undoubtedly important for the development of thinking. It is also important to understand the place that they occupy among other educational factors.

The models that explain students' performance were explored in order to study the conditions associated with the development of critical thinking. In particular, elective interdisciplinary courses in philosophy played an important role in this study (Galotti & Umscheid, 2019).

For this article, the research interest is peculiarities of formation of critical thinking in elective courses of humanitarian disciplines in higher education institutions. The focus of this research is studying the internal context of the educational environment of Ukraine's HEIs.

Unaddressed issues

The literature review identified a number of gaps in scientific knowledge. There is no evidence-based research examining how critical thinking has influenced professional competency development practices. There are no critical thinking development models that take into account organizational conditions, cultural and historical features of Ukrainian education. There is a lack of empirical evidence of the effectiveness of conditions for the development of critical thinking in Ukraine. There is a lack of reliable tools for assessing the level of critical thinking in Ukrainian HEIs.

At the same time, there is a lack of research aimed at the causes of the current situation. As a result, the scientific practice provides no understanding of the system of conditions which is necessary for the development of HEI students' critical thinking.

The aim of the research is to experimentally prove the effectiveness of the humanities electives in the development of critical thinking in HEI students.

Objectives

The study aimed to:

1. Find out the importance of critical thinking in HEI.
2. Find out the effectiveness of the implemented pedagogical strategies of critical thinking in HEI students.

3. Examine students' structural perception towards critical thinking during their study of humanities electives at HEIs.

Research Questions

The study seeks to answer the following questions:

1. What are the importance of critical thinking in HEI?

1. How effective are the implemented pedagogical strategies use in developing critical thinking in HEI students?

2. What are students' structural perception towards critical thinking during their study of humanities electives at HEIs?

LITERATURE REVIEW

Dewey (1933) вперше сформулював основні засади критичного мислення. According to the author, reflective activity is based on two components: 1) a state of some hesitation, doubt in solving the problem; 2) the process of finding facts that confirm or refute an idea. The reason for choosing this particular model is that it is the most general model that shows the key components to be considered. Universal competencies are studied in this research, in particular, critical thinking. Dewey states that reflective thinking is the active, persistent, and careful consideration of any thought or form of knowledge...

Kuzemko (2021) describes this concept more broadly. He states that critical thinking works on many levels. It is not satisfied with facts, but reveals the causes and consequences of these facts. The author compares critical thinking with "polite skepticism", which disputes the facts in generally accepted truths. From these positions, critical thinking means developing an opinion on an issue and the ability to defend this opinion with logical arguments.

Minchekar (2017) defines critical thinking as a special kind of thinking aimed at evaluating ideas. It is more closely related to verifying the accuracy of statements and the soundness of reasoning. Logical thinking is a sequence of statements that consist of separate stages of reasoning. Each subsequent conclusion is based on previously made sound conclusions (Sliusarenko, 2021). This is a conceptual thinking, which enables recognizing patterns, predicting the course of events, and explaining the essence of processes.

Staley (2014) maintains that critical thinking is informational thinking. It begins with statement of a question, seeking a convincing argument, and is social in nature. If the task is based on the principles of critical thinking, a person forms his/her ideas, evaluations, and beliefs. Therefore, it has an individual nature, being an independent thinking.

Mohan and Kelly (2020) considered the nature of scientific knowledge as a whole. The authors emphasize the need to organize the educational process in such a way as to provide students not only with knowledge, but also with knowledge acquisition skills. The authors note that education should be aimed at the development of a special critical thinking model in students, which would enable them to form a scientific picture of the world in the future. The work of the authors is of particular interest for this study, because the article examines the special pedagogical conditions of electives in the development of critical thinking.

According to Reida et al. (2021), critical thinking is a set of qualities and skills that determine a high level of student and teacher research culture. Critical thinking is characterized by reflection, for which knowledge is the starting point, not the finishing one. Reasoned and logical thinking should be based on personal experience and verified facts.

Pronskikh and Sorina (2022) considered the structure of critical thinking in their work. The authors pay special attention to the study of the influence of the humanities cycle on the development of critical thinking. The work states that full-fledged critical thinking is not possible without a comprehensive study of the humanities as the educational component.

The work of Akhmetzhanova, Emelyanova and Sundeeva (2020) is also of interest for this study. The authors believe that in order to create conditions for the development of critical thinking, it is necessary to understand what exactly should be developed. Therefore, despite the advantages identified by the authors in terms of the standards and requirements for the results of educational activities, it is necessary to develop a single definition. It is necessary to analyse the existing definitions for this purpose. The basis should be chosen before analysing the definitions. In this work, the field of activity of the authors of the definitions of critical thinking was chosen as one of the grounds.

According to Kwon and Lim (2020), the content of electives enables satisfying the cognitive interests of students in various fields of activity, using educational, personal and creative experience. The information obtained during the electives expands the student's general outlook. The elective course provides an opportunity to absorb oneself in the subject, to develop the independent learning skills.

Nakonechna (2021) studied the content of subject-oriented courses. It is aimed at deepening and expanding the content of certain topics of basic general subjects. These courses imply both purposeful development of cognitive activity and further readiness to learn the subject at a higher level.

Despite the fact that each author offers his/her own interpretation of the concept of critical thinking, they all agree that critical thinking is thinking that leads to revealing objective truth. The need for critical thinking arises when it is necessary to verify the reliability of judgments on a particular issue.

METHODS

Research design

The research was conducted in several stages. Table 1 presents the research stages, their description and time limits.

Table 1: Research stages

Item No.	Stage name	Time limits	Content
1.	Programming	March – September 2021 p.	Determination of the general population of the sample. Determination of the aim of the research, setting research objectives. Selection of research methods and tools.
2	Informational	September 2021 – June 2022 p.	Distribution of respondents into control and experimental groups. Implementation of the pedagogical conditions of electives and the traditional curriculum for World Philosophy for 2 years of study and Sociology for 3 years of the university studies. Implementation of the Astin's I-E-O Model for studying the development of critical thinking. The use of a quasi-experimental method for monitoring the effectiveness of the implementation of pedagogical conditions for the development of critical thinking. Here, this method is used to study the psychological characteristics of the respondents. Analysis of variance of independent variables using the R^2 criterion. Statistical processing of research results.
3	Analytical	June – September 2022	Processing of results. Summary of research results.

Source: prepared by the authors

Sampling

The experiment was carried out during real pedagogical process. The experimental work involved 378 students of which 180 are 2nd-year students, and 198 are 3rd-year students. This number of respondents for pedagogical experiment enables obtaining reliable results. The participants of the experiment were selected from among students of the 2nd-3rd years of study majoring in Pedagogy of Borys Grinchenko Kyiv University, which made it possible to obtain objective and reliable research results. This university has graduate departments of philosophy and sociology, which is why such a choice makes it possible to obtain more objective information. All respondents study the subject World Philosophy in the 2nd year, and Sociology in the 3rd year. A group of 15 experts was formed from among the teachers of this university. It was these experts who made it possible to obtain objective research results. Respondents were divided into two groups — experimental (EG) and control (CG). Pedagogical conditions of the electives were applied to EG students. Students of the control group studied according to the standard curriculum.

Instruments

Data entry and processing was carried out using the software product "Microsoft Excel" and "SPSS Statistics 18.0". All data are given in relative (% of the number of surveyed) values.

Data collection

Google Forms capabilities were used for the survey. This service made it possible to organize student surveys taking into account security requirements.

Analysis of data

1. This study involved a quasi-experimental method of probabilistic selection was used. It takes into account different ways of reducing the selection error, which enables estimating the effect of exposure. This method was applied in the work of the expert group.

2. The coefficient of determination (R^2) for multiple regression is a statistical metric used to measure how much of the variance in the results can be explained by the variance of the independent variables included in the model. The variation of R^2 ranges from 0 to 1, where 0 indicates that the outcome cannot be predicted by any of the independent variables, and 1 indicates that the outcome can be predicted without error based on the selected

independent variables. This method is aimed at analysing students' ideas about the development of their critical thinking.

3. Statistical calculations were performed using radius and nearest neighbour methods. The Mann–Whitney U test was also used for statistical processing of the obtained results, which was calculated according to the formulas:

$$U_1 = n_1 * n_2 \frac{n_1(n_1+1)}{2} R_1, \quad (1)$$

$$U_2 = n_1 * n_2 \frac{n_2(n_2+1)}{2} R_2, \quad (2)$$

$$U_{\text{empirical}} = \{U_1 U_2\}, \quad (3)$$

where n_1, n_2 – sizes of samples 1 and 2, respectively;

R_1, R_2 – rank sums of the groups.

4. The Cronbach's alpha reliability coefficient describes the internal consistency of the test items. The Cronbach's alpha is calculated using the formula:

$$\frac{N}{N-1} \left(\frac{\sigma_x^2 - \sum_{i=1}^N \sigma_{Y_i}^2}{\sigma_x^2} \right), \quad (4)$$

where σ_x^2 – total test score variance;

$\sigma_{Y_i}^2$ – i element variance.

5. Average value and standard deviation.

The longer the test, the higher the quality of its task and the higher the value of the Cronbach's alpha. Values ranging from 0.7 to 0.8 are considered satisfactory (Ali & Bhaskar, 2016).

Students' understanding of their level of critical thinking was taken as a variable in the study. An ordinal scale with four answer categories — “poor”, “satisfactory”, “good”, “excellent” — was used as response categories. It was decided that a three-factor model, which can be combined into one general factor, is appropriate for assessing students' understanding of their level of critical thinking.

Ethical criterion

The respondents gave informed consent for processing of their personal data and the publication of the research results. Research methods correspond to the academic principles of integrity, verifiability, lack of contradictions, respect for general human rights and freedoms. The work of experts is based on the principles of respect for the individual, scientific knowledge, impartiality, and non-involvement.

RESULTS

To reveal the effectiveness of introducing elective courses in Sociology and world philosophy, Table 2 provides data on the average success rate of students. The data are given for the experimental and control groups.

Table 2: Average value and standard deviation of academic performance of students in Sociology and World Philosophy

	Number of respondents	Середнє значення, хсер	Стандартне відхилення, σ
Sociology			
CG	100	3,8	0.4243
EG	98	4,4	
World Philosophy			
CG	90	4,0	0.3536
EG	90	4,5	

Source: created by the authors of the article based on the research results

Thus, Table 2 shows the difference in students' academic performance in the control and experimental groups. So, for the two courses, the second and third, which respectively study the World Philosophy and Sociology courses, the respondents from the experimental groups demonstrate higher results.

The variables of traditional and elective education were analysed using the Astin's I-E-O model to study the effectiveness of implemented pedagogical conditions for the development of critical thinking. Table 3 provides the results of the analysis of the variable of the traditional educational model. The value of the standardized load factors is statistically significant ($p < 0.01$). The Cronbach's alpha is 0.76, which is considered satisfactory.

Table 3: Impact of implemented pedagogical conditions and not “Analysis of the Traditional Type of Education variable”

Item No.	Name of the sub-variable	Value of the correlation coefficient
1.	Lecture presentation of the material to students. Writing from dictation or from the board.	0.48
2.	The teacher focuses on encouraging memorization of the educational material.	0.69
3.	The teacher focuses on the student’s learning of certain facts, rather than logical connections between facts.	0.71
4.	The teacher expects that students will perceive the educational material as indisputable facts.	0.75

Source: created by the authors of the article based on the research results

The values of the proposed model are within the statistical norm, which makes it appropriate for the use to compare the effectiveness of pedagogical conditions in the development of critical thinking. The table shows that the indicator of the lecture presentation of the material to students is critically outside the expected statistical value. This cannot have a critical impact on the research results because it is not a critical sub-variable in this study.

Table 4 shows the results of the analysis of the variable model of the introduction of electives. The values of the standardized load factors are statistically significant ($p < 0.01$). The Cronbach’s alpha is 0.71, which is considered satisfactory.

Table 4: Analysis of the Humanities Electives variable

Item No.	Name of the sub-variable	Value of the correlation coefficient
1.	A seminar form of learning material using the flipped classroom.	0.78
2.	The teacher focuses on students’ understanding of the educational material.	0.69
3.	The teacher focuses on teaching students to find and analyse logical connections and regularities.	0.73
4.	The teacher expects students to engage in lively discussion and to be critical of information, using and analysing various sources.	0.74

Source: created by the authors of the article based on the research results

The data in Table 4 is the ground for the conclusion that the values of the proposed model range within the statistical norm. The indicator “The teacher focuses on students’ understanding of the educational material” is out of the range of statistical significance. A difference of 0.01 is within the range of statistical error, which can be ignored in the general analysis.

The results of the assessment of students’ perceptions of their level of critical thinking are presented with a standard deviation of 10 points. Table 5 shows the results of the study. A comparison of the statistical significance of the differences in means between groups shows that the differences are statistically significant ($p > 0.1$).

Table 5: Analysis of students’ ideas about the development of their critical thinking for the control and experimental groups

Group	Average score	Effectiveness of learning. Method of radii	Effectiveness of learning. Nearest neighbour method	Standard error. Method of radii	Standard error. Nearest neighbour method	$U_{\text{empirical}}$
CG	70.12	0.846	0.836	0.340	0.472	194
EG	78.85	0.911	0.911	0.351	0.480	259

Source: created by the authors of the article based on the research results

The impact of one year of study on students' perceptions of the level of critical thinking was assessed in the course of the study. The control and experimental groups were aligned on the basis of variables — cultural capital, level of students' training. It can be concluded that in the course of learning, students' perception of their level of critical thinking depends on pedagogical conditions, namely on the content and form of the humanities course. Students who took the humanities electives have a deeper understanding of their own critical thinking.

Table 6: Results of the regression analysis of the state of development of HEI students' critical thinking

	Constructivism	The latest teaching methodology	Control variables	Professional competence	Constructing competence
Constructivism	0.11** (0.02)	0.09** (0.02)	0.05* (0.02)		
Professional competence				0.18** (0.03)	
Group work		0.9 (0.4)	0.9 (0.4)	0.9 (0.4)	0.9 (0.4)
Critical thinking		0.08** (0.02)	0.09** (0.02)	0.09** (0.02)	0.09** (0.02)
Level of training (average score for the year in the subject)		0.01** (0.00)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)
Motivation			0.09** (0.00)	0.07** (0.00)	0.07** (0.00)
Const	-0.30*** (0.03)	-0.94** (0.10)	-1.76* (0.57)	-1.71* (0.56)	-1.72* (0.56)
R ²	0.06	0.13	0.19	0.23	0.18
***p<0.01; **p<0.5; *p<0.1					

Source: created by the authors of the article based on the research results

The results of the regression analysis show that without control of teaching methods and student characteristics ($\beta=0.12$; $p<0.1$), as well as with their control ($\beta=0.05$; $p<0.1$), the level of development of critical thinking changes. The use of a traditional type of education does not lead to dynamic changes in the critical thinking development ($p>0.1$). However, if the traditionalist teacher has developed organizational competence, the relationship with the level of development of critical thinking becomes statistically significant and positive ($\beta=0.11$; $p<0.05$).

For teachers with developed professional competencies, the relationship with the level of students' critical thinking is almost equal to the degree of relationship for teachers without taking into account professional competencies ($\beta=0.05$; $p<0.1$; and $\beta=0.06$; $p<0.1$, respectively). That is, the teachers' work is related to the level of critical thinking regardless of the level of subject-logical and organizational competence. At the same time, the level of critical thinking is related to traditional methods of teaching organization only if the teacher has developed organizational competence.

Correlations between active teaching style and professional competencies are positive and statistically significant ($P=0.37$; $p<0.05$). The correlation between passive teaching style and professional competencies is negative and statistically significant ($P=-0.22$; $p<0.001$). Subject-logical and organizational competences are among the strongest predictors of the level of critical thinking ($\beta=0.19$; $p<0.05$).

Analysis of teaching methods shows that elective courses are the strongest predictor of the level of critical thinking ($\beta=0.22$; $p<0.01$). A positive relationship was found between group projects and the level of critical thinking, but only when controlling student characteristics ($\beta=0.11$; $p<0.05$).

The coefficient of determination (R^2) of the proposed model is 0.2. That is, 20% of the variance of critical thinking level scores can be explained by the variance of the independent variables included in the model. This indicator is considered satisfactory for research in the field of humanities and social sciences, since human behaviour cannot be accurately predicted. So, it can be concluded that the proposed research model well explains the difference in the level of students' critical thinking.

DISCUSSION

The obtained results of the study confirm the results of Khodorchuk (2021) and indicate that the level of critical thinking in the humanities electives increases. The unique organizational setting of the electives is a major

reason for this is, as evidenced by the research of Yu et al. (2021). As the results of this authors' research, as well as the results of this study show, this skill is not automatically developed along with other educational outcomes. Special pedagogical conditions must be created for the development of critical thinking in HEI students.

The results of the analysis enabled identifying the components of pedagogical conditions positively related to students' critical thinking, which is confirmed by the research of Yu (2021) and Mudra and Mudryi (2022). The following factors should be noted:

- type of education (elective; traditional);
- active learning methods (project activity);
- teacher's professional competences.

The obtained model provides a good explanation of the difference in the level of critical thinking. The variables included in the model explain 20% of the variance in the level of critical thinking. However, the results of the research conducted by Peñaranda et al. (2021) deny the influence of the type of learning on the development of critical thinking. The researchers single out statistically significant results of the impact of teaching methods and teachers' professionalism only.

As already mentioned above, teachers who are purposefully engaged in the development of students' critical thinking, use teaching methods that have positively proven themselves obtain high results. Such teachers also use methods of meaningful reading. Teachers must, however, independently select texts in order to organize meaningful reading, since assignments provided in textbooks do not contribute to, but rather hinder, the development of critical thinking, and there are no material and technical conditions for organizing group learning. This probably explains the lack of connection between group learning and the level of critical thinking. This opinion corresponds to the results of the study conducted by Plotnikova and Strukov (2019). Although the authors do not rule out the significant role of group work in the development of students' critical thinking, they still prefer a person-oriented model.

The probable reason for the prevalence of the general approach is that it is implemented by some self-motivated teachers, and interested students take part in these courses as they are elective. The use of an immersive organizational form can be explained by the fact that the inclusion of critical thinking as an educational outcome in the subject programme imposes a certain responsibility on the teacher. Where the inclusion of critical thinking as an educational outcome is not required, teachers prefer to do so. Further research is needed to clarify the reasons.

The obtained results are close to the findings of Plotnikova and Strukov (2019), as well as Ishmuradova and Ishmuradova (2019). The authors of the study found that a significant proportion of students majoring in Pedagogy have a deep understanding of the concept of critical thinking and are familiar with its development practices. The results of this study confirm a number of conclusions drawn by Kopotun et al. (2020), namely, that the development of critical thinking depends on the teacher's work methodology. At the same time, several studies, namely Synelnyk and Stonoha (2021), as well as Voronin et al. (2020), revealed a minor role of the teacher's personality in the development of students' critical thinking. The authors note that the content of educational programmes is of great importance.

The theoretical significance of the work is a systemic review of the state of studying the problem of the development of critical thinking in modern pedagogical science. The article contributes to the discussion on the need to introduce electives as a tool for profiling the educational process. The study was aimed at covering the significant results of the development of critical thinking during such courses. The practical significance of the study is in the created practical model to study the impact of various pedagogical conditions on the development of educational variables. The HEI students' critical thinking was studied as a variable in this research.

The main limitations of the study are determined by the active phase of the full-scale invasion of the Russian Federation on the territory of Ukraine and the introduction of martial law. Such conditions not only complicate the research procedure, but also introduce random variables that cannot be taken into account in the research design. These variables are related to the psychological state of the respondents and may affect the results of the study. That is the study involved complex multivariate methods of data analysis.

CONCLUSIONS

The relevance of the research is determined, on the one hand, by the need to improve educational programmes in order to make them up-to-date. On the other hand, the research is designed to meet the need for training a new generation of specialists — highly independent people with critical and independent thinking. Analysing the research findings, we can say that critical thinking is the result of complex and multifactorial educational activities, which requires special pedagogical conditions for its development. Humanities electives are designed to build the student's background for critical and independent thinking. The results of the conducted research evidenced the effectiveness of the proposed pedagogical conditions in comparison with the traditional curriculum.

The effectiveness of the development of critical thinking in students who studied according to a special programme of electives can be unequivocally asserted based on the obtained data. The model of conditions necessary for the development of students' critical thinking, as one of the mandatory educational results, includes a system of pedagogical and corresponding organizational conditions. At the same time, the developers and researchers of existing models emphasized either pedagogical conditions or organizational conditions. The results of the study can be useful to teachers and administrators of HEIs who are interested in the development of students' critical thinking. Further research should focus on finding optimal pedagogical conditions and educational variables that would contribute to the development of HEI students' critical thinking.

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