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CRITICAL THINKING AS A FACTOR IN THE DEVELOPMENT OF SOFT SKILLS

Abstract

In this article we consider the problems of "critical thinking" as a cause of insufficient development of soft skills in high school students. In the course of theoretical analysis the concept and characteristics of critical thinking as a soft skill are established and different approaches to the development of critical thinking skills in high school students are outlined. Since critical thinking allows to guide and control the whole process of learning in school, including the independent development of students regarding the acquisition of not only knowledge, but also soft skills. The special connection between logic and creative thinking is noted. The main ways of developing critical thinking as a factor in the development of soft skills according to the Delphi model (Peter Facione) are outlined. The results of practical research based on the key cognitive skills have shown that the level of development of soft critical thinking skills is a necessary condition for the development of high school students, as soft critical thinking skills were developed in them during the experiment, albeit slightly (due to the use of modern techniques and methods of technology in the process of teaching and education), which determines the effectiveness of their further development.

It is recommended to use in school education, in high schools, interactive techniques and methods of developing soft skills, while taking into account the age of students and their need to form critical thinking both for self-development and for the acquisition of other competencies.

Keywords: *critical thinking, competencies, soft skills, skills; submenia, high school students, logic, techniques, methods, technologies.*

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СЫНИ ТҰРҒЫДАН ОЙЛАУ ИКЕМДІ ДАҒДЫЛАРДЫ ДАМУ ФАКТОРЫ РЕТІНДЕ

Аңдатпа

Бұл мақалада біз «сыни тұрғыдан ойлау» мәселелерін жоғары сынып оқушыларының икемді дағдыларының жеткіліксіз дамуының себебі ретінде қарастырамыз. Теориялық талдау барысында сыни тұрғыдан ойлаудың икемді дағды ретіндегі түсінігі мен сипаттамалары анықталып, жоғары сынып оқушыларының сыни

тұрғыдан ойлау қабілеттерін дамытудың әртүрлі тәсілдері көрсетілген. Сыни тұрғыдан ойлау мектептегі барлық оқу үдерісін, оның ішінде оқушылардың білімді ғана емес, сонымен қатар икемді дағдыларды меңгеруге қатысты өз бетінше дамуын басқаруға және басқаруға мүмкіндік беретіндіктен. Логика мен шығармашылық ойлаудың ерекше байланысы атап өтілді. Delphi (Peter Fasione) моделі бойынша икемді дағдыларды дамыту факторы ретінде сыни ойлауды дамытудың негізгі жолдары көрсетілген. Негізгі икемді дағдыларға негізделген практикалық зерттеулердің нәтижелері көрсеткендей, сыни ойлауның даму деңгейі жоғары сынып оқушыларының дамуының қажетті шарты болып табылады, өйткені оларда сыни ойлауды эксперимент кезінде аздап болса да дамыған (оқыту мен тәрбиелеу процесінде технологияның заманауи әдістері мен әдістерін қолданудың арқасында), бұл олардың одан әрі дамуының тиімділігін анықтайды.

Оқушылардың жасын және олардың өзін-өзі дамыту үшін де, басқа құзыреттіліктерді игеру үшін де сыни ойлауды қалыптастыру қажеттілігін ескере отырып, мектептегі білім беруде, орта мектептерде икемді дағдыларды дамытудың интерактивті әдістері мен әдістерін қолдану ұсынылады.

Түйін сөздер: сыни тұрғыдан ойлау, құзыреттілік, икемді дағдылар, дағдылар, субмения, жоғары сынып оқушылары, логика, тәсілдер, әдістер, технологиялар.

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КРИТИЧЕСКОЕ МЫШЛЕНИЕ КАК ФАКТОР РАЗВИТИЯ ГИБКИХ НАВЫКОВ

Аннотация

В этой статье мы рассматриваем проблемы «критического мышления» как причину недостаточного развития *soft skills* у старшеклассников. В ходе теоретического анализа устанавливаются понятие и характеристики критического мышления как мягкого навыка, а также излагаются различные подходы к развитию навыков критического мышления у старшеклассников. Поскольку критическое мышление позволяет направлять и контролировать весь процесс обучения в школе, включая самостоятельное развитие учащихся в части приобретения не только знаний, но и мягких навыков. Отмечается особая связь между логикой и творческим мышлением. Изложены основные пути развития критического мышления как фактора развития *soft skills* в соответствии с моделью Delphi (Питер Фасионе). Результаты практических исследований, основанных на ключевых мягких навыках, показали, что уровень развития критического мышления является необходимым условием развития старшеклассников, поскольку критического мышления были развиты у них в ходе эксперимента, хотя и незначительно (за счет использования современных приемов и методик технологий в процессе преподавания и воспитания), что определяет эффективность их дальнейшего развития.

Рекомендуется использовать в школьном образовании, в старших классах, интерактивные приемы и методики развития мягких навыков, принимая при этом во внимание возраст учащихся и их потребность в формировании критического мышления как для саморазвития, так и для приобретения других компетенций.

Ключевые слова: критическое мышление, компетенции, *soft skills*, умения; подмены, старшеклассники, логика, приемы, методики, технологии.

INTRODUCTION

In modern conditions, based on the peculiarities of the development of the education system as part of the information-oriented world, all new requirements are imposed on the training of future specialists already at school, who have the necessary competencies that allow them to adapt flexibly to all life and production circumstances. Besides, nowadays a person meets with a huge flow of not always controlled and dosed information. It is necessary to take into account that even a trained adult can sometimes be difficult not to be confused, to assess the reliability and validity of data and find the right decision. And for many schoolchildren, functionally competent work with more complex information requiring logical thinking is often presented as an «asterisk» task, as inaccessible to all. Because only a student who has developed critical thinking skills can solve such problems. Critical thinking helps students ensure a sufficient level of functional literacy.

American philosopher John Dewey, the author of the term critical thinking, defines it not as a skill, but as a complex competence expressed in persistent, active, and carefully applied thinking about all types and forms of information. It divides it into reflexive and autonomous thinking [1]. This is due to the fact that critical thinking includes not only thinking, but also communicative components, and is also marked and the presence of important elements derived from a person's life experience. Many authors refer critical thinking to meta-skills, as they really help a person other skills, such as hard skills and some soft skills [2; 3].

All this points to the need to develop soft skills (or soft skills) at school and especially in high school. In recent years, critical thinking as an indicator of a person's ability to question both his/her own beliefs and any other information has been emphasized among soft skills. This is due to the fact that the most important task of modern school education is not the acquisition by students, as before, only a set of knowledge and skills, but the formation of an internally free and thinking person who is able to form his or her own point of view and argue for it, as well as to set promising goals and find effective ways to achieve them. In addition, with the help of critical thinking, students can more easily choose the right and correct sources of information, be able to find cause-and-effect relationships, justify their position and recognize the strengths and weaknesses in the position of others.

The scientific significance lies in substantiating the necessity and importance of critical thinking as a tool for the development of soft skills in high schools of education, in determining the importance of psycho-diagnostic study of the level of formation of soft critical thinking skills in high school students and in determining the relationship between the level of effectiveness of the use of critical thinking skills and the level of formation of soft skills.

The purpose of the study is to establish the relationship between the level of development of critical thinking and indicators of the effectiveness of the development of its skills.

MATERIALS AND METHODS

First of all, it is based on aspect analysis, which is presented by A.G. Burda as a separate type of analysis used when considering some, previously written scientific text, from a certain angle, in the context of some idea or theory and based on the research topic or some doctrine [4]. This theoretical analysis is employed to theoretically interpret scientific material related to the research topic, considering specific issues and the potential for practical application. A literature review on the research topic was conducted based on the nuances of the aspect analysis.

Let us disclose the concept and characteristics of critical thinking as a soft skill, based on the fact that pedagogical and psychological sciences indicate different approaches to this concept. Critical thinking as a separate scientific term comes from the English word «critical thinking» and is denoted through the system of a person's own judgments, which is used by him/her to analyze events and individual things, with the reflection of reasonable conclusions and gives the opportunity to make reasoned interpretations and evaluations, as well as to use the obtained thinking results as a learned skill for certain situations in the presence of certain problems [5]. Critical thinking is expressed through an individual's active endeavor to understand something that

is happening by the way of understanding it, as well as comprehending and evaluating confirmations of facts or events and as such deep comprehension of the thinking process itself. Critical thinking enables a person to make objective conclusions. Critical thinking is also understood as open thinking that does not accept axioms and is formed by superimposing new information on the existing life experience. In a general sense, we can denote by critical thinking a higher level of thinking than the original thinking that the person possessed.

Let's outline the main characteristics of critical thinking, which reveal its content and basic requirements, and which received the name «GLOBUS» (by the first letters): soft thinking - G; logical thinking - L; reasoned thinking - O; impartial thinking - B; organized thinking - U; independent thinking - C [6]. Attributes as outlined by J. Burrell, which the author believes should be possessed by an individual who engages in critical thinking: problem-solving capabilities and determination in addressing issues; the capacity to self-assess and consistently evaluate one's impulsiveness; ability to solve problems in cooperation with others; openness of a person to other ideas; ability to listen to one's interlocutor; tolerance; empathy; ability to consider one's own and other people's problems from different sides; ability to build multiple connections between phenomena; tolerance to other points of view; tolerance to other points of view; tolerance to other points of view; tolerance to other people's ideas; tolerance to other people's ideas. They also include inquisitiveness, frequent «good questions» as well as those such as "what if ...? [7].

World researchers are now showing what soft skills are needed for a person living in the 21st century, with many emphasizing communication skills; creativity skills; teamwork skills; and of course critical thinking skills. Thus highlighting the presence of problems in their development. When considering the problem of the concept of "critical thinking" as a factor in the development of soft skills, it is necessary to dwell on the study, on logic and critical thinking, according to which it is established that critical thinking appears to be a tool for the formation of soft skills in students, as critical thinking allows you to guide and control the entire learning process, including their independent development to acquire other not only knowledge, but also skills, including soft skills [8].

At the same time, it is important to remember that the system of modern education requires the development of soft skills, especially vital skills, the process of which occurs «in parallel with the process of learning by subjects or with the help of the potential obtained from individual academic disciplines». One cannot but agree that the transition from teaching only the subject content (knowledge and skills) to the formation of competencies in the format of soft skills should be carried out gradually, introducing logic tasks in lessons or using various interactive methods and forms of learning, based on the peculiarities of the modern educational process [9].

A special connection between logic and creative thinking is noted, as knowledge of logical research methods and their application in the learning process, usually indicates a higher level of development of critical thinking noted in students [10].

Special attention is paid to different ways of forming and developing soft skills based on critical thinking, among which the following should be emphasized: situational logic exercises; training exercises; problem discussions; role-playing games; brainstorming; creative work in small groups; open-ended and practice-oriented tasks; creative applied tasks; logic development tasks; mentoring; self-training; open and practice-oriented tasks; creative applied tasks; tasks for the development of logic; mentoring; self-study; project work and other non-educational activities. All the above methods should be implemented in the form of interactive learning and built mainly on the principle of «here and now» to ensure the effectiveness of purposeful group and intergroup work [11].

It is also suggested, as part of the experience of introducing interactive teaching methods in the educational process, to use the DCTRW pedagogical technology (development of critical thinking through reading and writing [12]. The techniques and strategies of DCTRW pedagogical technology have been in demand in the practice of post-Soviet schools since 1997. This technology is used quite actively by many teachers and nowadays, its use allows not only to effectively organize the process of teaching logic and critical thinking, but also helps students to adapt

successfully to the upcoming conditions of further education, work and life. Since this pedagogical technology is aimed at the development of universal competencies and other soft skills.

It should be noted that critical thinking in RWCT technology is a process of correlating the information received by a person with what he/she knows, as well as with the development of decisions and what in them should be supplemented or rejected. Application of DCTRW teaches students the techniques and methods of implementing active actions, which are realized in several stages: the first - challenge; the second - reflection; the third - reflection" [13].

The main ways to develop critical thinking as a factor in the development of soft skills:

- constantly increasing one's knowledge, since the more knowledge one has, the more one analyzes and compares and analyzes it. Besides, to critically evaluate a problem, it should be examined in a multifaceted way, trace its temporal development and look at the problem situation in connection with other events;
- analyze texts, especially information from books and the Internet. It is obligatory to analyze the read text in detail to determine the purpose of writing, the thought behind it, the audience, the author's point of view on the problem.
- identify ways to solve the problem and the hidden meaning;
- ask meaningful questions;
- come up with different options to explain different life situations;
- explore alternative information sources;
- learn from other people's mistakes;
- exercise with the help of different kinds of logical methods and so on [14].

Proceeding from the topic of our research we should also proceed from the soft critical thinking skills outlined by the Delphi model, which was defined in 1990 by a group of American experts (47 experts from the USA and Canada) as a common understanding of the formal concept of critical thinking and its six cognitive skills.

Critical thinking, as defined by the Delphi model, pertains to a self-regulated and intentional process of making judgments that individuals use to examine, interpret, assess information, and derive overarching conclusions. These judgments are employed to elucidate conceptual, methodological, evidential, contextual, or criteriological reasoning, which forms the foundation of the entire thought process. Based on this model, six key cognitive skills of critical thinking have been identified, which have reached full agreement in their content description by all experts:

1. Critical thinking skill in the form of "Interpretation" - expressed in the ability to understand and articulate the meaning of various phenomena, meanings, events, etc. Interpretation also includes some sub-skills: "decoding meaning" (or paraphrasing), "categorizing" (or classifying), "clarifying meaning" (or reformulating);

2. Critical thinking skill in the form of "Analysis" is characterized by one's ability to identify among statements, questions, concepts and descriptions logical connections, etc. Analysis includes such sub-skills as: "testing ideas", "discovering arguments", "considering arguments";

3. Critical thinking skill in the form of "Evaluation" is denoted as the ability of a person to evaluate analytically statements or other representational forms. Evaluation includes such sub-skills as: "evaluating claims", "evaluating arguments".

4. Critical thinking skill in the form of «Inference» denotes a person's ability to express conclusions well and quickly. Inference includes the following skills: "clarifying evidence and corroboration", "hypothesizing alternatives", "drawing conclusions".

5. Critical thinking skill in the form of "Explanation" can be characterized by a person's ability to formulate a reasoning and explain it, to present his/her reasoning by means of convincing arguments. Explanation includes the following skills: 'presenting or formulating results', 'justifying procedures and methods explaining them', 'presenting arguments'.

6. Critical thinking skill in the form of "Self-regulation" as the ability to check many cognitive activities; Self-regulation includes such sub-skills as: "self-checking" and "self-correction" [15].

RESULTS

The main methods of research of the problem we have outlined are the following:

Theoretical methods of scientific research: aspect analysis of literary sources (theoretical, scientific, Internet resources), methods of synthesis and generalization and comparison;

Diagnostic methods of psycho-diagnostic study of the level of formation of soft skills of critical thinking in high school students of the Secondary General Education School named after Muzafar Alimbayev in Pavlodar city. 28 pupils of 10th grade and 28 pupils of 11th grade took part in it.

To determine the formation of soft critical thinking skills we used the testing methodology according to Lauren Starkey. Based on the study's purpose and objectives of evaluating soft critical thinking skills, six soft critical thinking skill indicators were identified along with two additional indicators: the seventh for critical thinking development and the eighth for performance. These indicators include: 1st – interpretation», 2nd – "analysis", 3rd – "evaluation", 4th – "formulation of conclusions", 5th – "explanation", 6th - "self-regulation", 7th - "development of critical thinking skills", and 8th - "ability to apply critical thinking skills in practice».

The study was carried out in two phases: an initial assessment in the 10th grade and a follow-up assessment in the 11th grade after a specialized course on developing critical thinking skills.

During the second phase, the study also investigated the correlation between the effective use of critical thinking skills and the level of soft critical thinking skill development. To achieve this, 11th-grade students were divided into two groups: one consisting of students who infrequently use critical thinking skills or do not use them at all, and another group consisting of students who actively use critical thinking skills.

The results of the level of development of soft critical thinking skills of students at the initial stage are shown in Table 1.

Table 1 - Results of the level of development of soft critical thinking skills in 10th grade students, in %

№		High	Medium	Low (acceptable)
1	Interpretation	4	46	50
2	Analysis	18	37	45
3	Appraisal	12	48	40
4	Formulation of conclusions	33	56	11
5	Explanation	17	52	31
6	Self-regulation	30	50	20
7	Overall level of development CT skills	2	54	44

The results of studying the level of development of soft critical thinking skills in 11th grade students (control stage), compared to 10th grade (initial stage) M are presented in Table 2.

Table 2 - Indicators of development of soft critical thinking skills in 11th grade students, compared to the initial stage, in %

№		High Grade 10	High Grade 11	Medium Grade 10	Medium Grade 11	Low Grade 10	Low Grade 11
1	Interpretation	4	7	46	40	50	44
2	Analysis	18	21	37	32	45	47
3	Appraisal	12	14	48	52	40	34
4	Formulation of conclusions	33	43	56	46	11	11
5	Explanation	17	23	52	49	31	28
6	Self-regulation	30	58	50	58	20	12
7	Overall level of development	2	10	54	55	44	35

CT skills						
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The figure 1 shows the results of the comparative analysis, in %, for clarity.

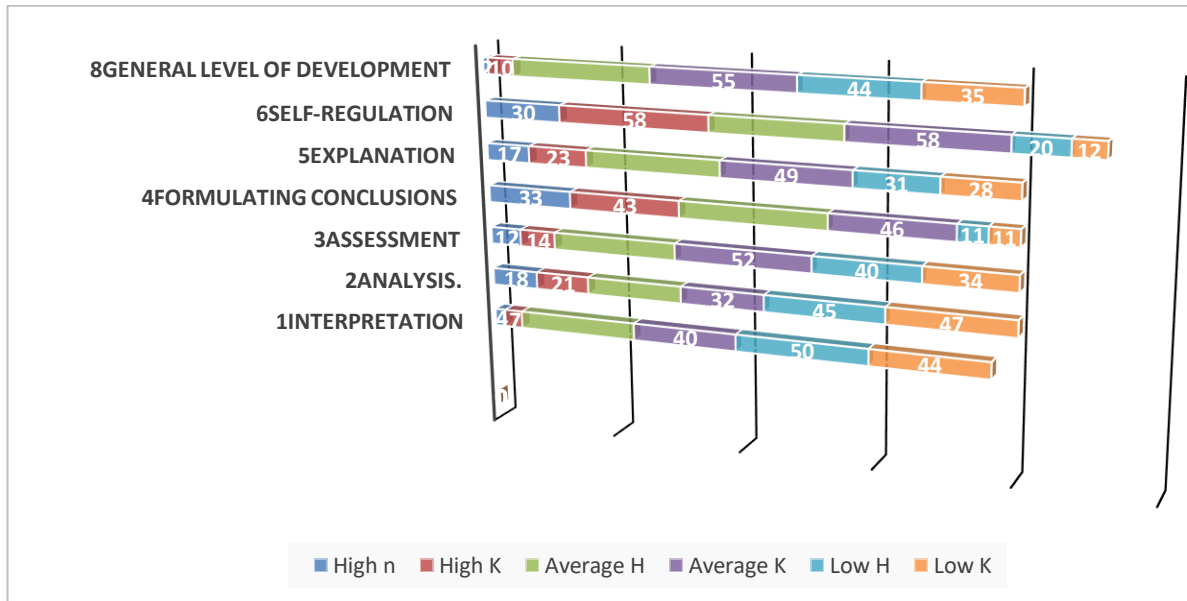


Figure 1 Results of comparative analysis of the development of soft critical thinking skills among high school students

Figure 2 indicates the results of the critical thinking skills effectiveness of the relationship between the level of critical thinking skills effectiveness (indicator 8.) and the level of soft CF skills formation (indicator 7).

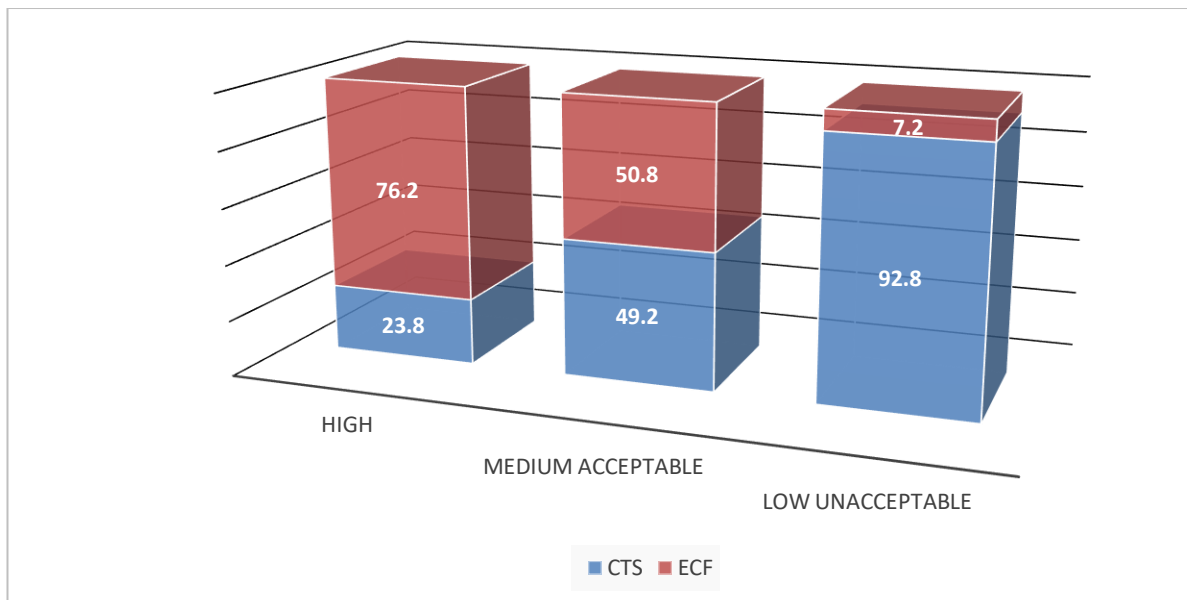


Figure 2 - Effectiveness of using soft critical thinking skills depending on their overall level of development (in %)

DISCUSSION

Soft skills or abilities necessary for the development of critical thinking in high school students, based on the fact that anyone can think critically. can think critically. can think critically. In this case, we can refer to the opinion of J. Piaget, who wrote that a person comes already by the age of 14-16 years the stage in which the best conditions are formed in order to more successfully develop critical thinking. For a person at the age of high school students to be able to think

critically, it is important to help him/her to form a number of soft qualities (L.I. Shcherbakova, N.V. Bykovsky, D.A. Vasilenko, V.N. Korgagin, D.A. Nikulin, D.S. Shepilov, D.V. Shnyakin, A.V. Yudin), among which we can highlight such as:

— meaningful readiness of a young person for the planning process. It is conditioned by the fact that quite a part of a person's thoughts arise chaotically, so it is necessary to organize all thoughts and to build their presentation in a consistent manner. It should be noted that the sign of moderation is the orderliness of a person's thoughts;

— The ability to think flexibly is defined by the notion that unless a young individual is open to understanding others' ideas, they won't be capable of generating their own thoughts and ideas. Flexibility in thinking empowers a person to withhold judgment until they have a sufficient range of information available to them;

— The perseverance in thinking stems from the idea that when faced with a challenging task, a person often delays its resolution. By cultivating persistence in challenging their thinking, an individual will inevitably achieve more favorable outcomes;

— Willingness to rectify personal errors during the thought process, as an individual engaging in critical thinking will not rationalize incorrect decisions, but will endeavor to derive conclusions, thus accruing experience from their own mistakes;

– Consciousness during the thought process is regarded as a crucial attribute because it signifies the capability to observe oneself while thinking and to oversee one's own logic;

– Expertise in discovering compromise resolutions is crucial. It is vital that a person's decisions are well-received by others, as otherwise, these decisions will merely be seen as personal opinions without broader impact.

The methodology for nurturing critical thinking among high school students advocates for the essential utilization of specific methods, techniques, and strategies that integrate the entire learning process, allowing each stage of training sessions to be methodically realized: challenge, reflection, and synthesis. Techniques for fostering critical thinking skills during the challenge stage include: Brainstorming, Memory mapping, Dissecting mixed logical chains, Value ladder method, and the «We Know, We Want to Know, We Learned» approach. Methods for enhancing critical thinking abilities during the comprehension phase encompass: Note-taking method, «Who? What? When? Where? Why?» method, Openwork saw method, Stop-and-Go reading (watching, listening), and the Carousel method. Lastly, strategies for developing critical thinking during the reflection stage involve: Gallery method, «Leave the Last Word for Me» approach, Synquain technique, Circles on Water exercise, and the RAFT strategy. The results of the level of development of soft critical thinking skills among 10th grade pupils have shown that half of pupils have a low but unacceptable level of critical thinking, characterizing such skill as interpretive abilities (according to indicator 1), 46% have an average level and only 4% of pupils have a high level. In general, by this indicator, pupils have obvious difficulties in interpreting the description of facts, events, statements, in determining the meaning of individual meanings, in describing them and in categorizing them.

Regarding the second criterion: to scrutinize and pinpoint the most crucial arguments and logical linkages, a superior level is attained by just 18% of students, while an average level is demonstrated by 37% of students, and a lower level is observed in the majority of students (45%).

In terms of the third criterion, «Evaluation», the majority of students exhibit a moderate or subpar level of critical thinking skills. Only 12% demonstrate a high proficiency.

As for the fourth criterion, «Formulating conclusions», more than 56% display an average proficiency, 33% exhibit a high level, and 11% possess a lower level of competence.

The fifth indicator «Explanation» also has an average level of 52%, a low level of 31% and an average level of 17%.

For the sixth indicator «Self-regulation»: average - 50%, high level - 30% and low level - 20%.

Based on the seventh metric «Overall Level of Critical Thinking Skills Development», it was observed that the predominance of 10th-grade students achieved an average acceptable level

of Critical Thinking (CT) skills formation - 54%. Only 2% demonstrated a high level of CT development, while an unacceptable low level was seen in 44%. These metrics highlight an inadequate level of soft critical thinking skills development.

The results of the study of the level of formation of soft critical thinking skills of 11th grade students (control stage), in comparison with 10th grade (initial stage), in accordance with the obtained data on all indicators, the best results are noted at the final stage, which can be shown on the example of a high level: «Interpretation» indicator - increase from 4% to 7%, «Analysis» - increase from 18% to 21%, «Evaluation» - increase from 12% to 14%, «Formulation of conclusions» - increase from 33% to 43%, «Explanation» - increase from 17% to 23%, «Self-regulation» - increase from 30% to 58%, «General level of CF skills development» - increase from 2% to 10%.

In total, 11th grade students have a higher level of development of soft critical thinking skills, as it is in the limit of average acceptable levels of development (55%) High level of development of soft critical thinking skills is defined in 10% of students (with an increase of 8%). Low level of unacceptable values (35%), with a decrease of 9%.

The results of the effectiveness of critical thinking skills from the position of their application in different situations and to achieve different goals. The first group included 65% of students not using critical thinking skills (CTS), the second group included 35% of students (actively using soft critical thinking skills (ECF).

High school students with an overall high level of development of soft CF skills made up the majority of the ECF respondent group: 76.2% (ECF) and 23.8% (CTS).

Pupils with an average acceptable level of soft CF skills development (according to indicator 7) are represented approximately equally in both the group in the ECF group (50.8%) and in the group with NCF (49.2%).

Meanwhile, the majority of students (or 92.8%) with low unacceptable levels of soft critical thinking skills were in the group with CTS.

These indicators show that the level of development of soft critical thinking skills is essential for the development of high school students, as it determines the degree of effectiveness of their use. Soft critical thinking skills are subject to development, albeit slightly, with the right approach and understanding of the importance on the part of students.

CONCLUSION

In the course of aspectual literature analysis the concept and characteristics of critical thinking as a soft skill are revealed and different approaches to the concept and content of critical thinking are outlined.

When considering the problem of the concept of «critical thinking» as a factor in the development of soft skills in high school students, it was established that logic and critical thinking are presented as a tool for the formation of soft skills in students, as they allow to guide and control the entire learning process, including their independent development for the acquisition of others not only knowledge, but also soft skills. The special connection between logic and creative thinking noted in students. The main ways of critical thinking development as a factor of soft skills development are outlined, including according to the Delphi model, which was defined in 1990 by a group of American experts.

Based on the Delphi model, six key cognitive skills and two additional ones were identified, within which the experimental study was conducted. The obtained indicators confirm that the level of development of soft critical thinking skills is a necessary condition for the development of high school students, as they show the degree of effectiveness of their use. Since we found that soft critical thinking skills were through the use of active techniques and methods were developed, albeit slightly. On this basis, it is worth recommending in school education, in high school, to use interactive techniques and methods of development of soft skills of critical thinking and necessarily take into account the age of students. In this case, try to educate students to understand the importance of the development of critical thinking as the main reason for the formation of soft

skills, which give them the opportunity not only to guide, but also to control the process of acquiring other knowledge and skills, independent development and success in many ways.

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