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**FEATURES OF ONLINE LECTURES ON MEDICINAL CHEMISTRY  
 USING THE MICROSOFT TEAMS PLATFORM**

*The article is devoted to the peculiarities of conducting lectures online. Traditionally, classroom classes are the main form of learning in educational institutions. With the start of the coronavirus epidemic, educators around the world have had to look for new alternative ways of teaching for the first time, taking into account the need to limit contacts between participants in the educational process. Today, distance learning technologies have acquired a new meaning. Later, the world educational community returned to the classroom form of education. However, in February 2022, a full-scale war came to our country and new challenges arose regarding guaranteeing the safety of the educational process. The management of educational institutions of Ukraine, depending on the security situation in the region, decides on the format of the educational process: classroom, mixed and remote. During the mixed form of education, practical, seminar and laboratory classes are held in classrooms, and lectures are held online. An urgent problem today is the choice of technologies that will make it possible to ensure the delivery of educational material to students in a distance form in the most convenient format for them with the provision of the appropriate level of teaching of academic disciplines. During the conducted research, it has been determined that with distance or mixed form of education, modern information technologies should be the basis of modern educational space in every educational institution, regardless of geographical location, form of ownership, level of accreditation. Also, the features of conducting online lectures on Medical Chemistry using the Microsoft Teams corporate platform have been established, the use of which will contribute to the delivery of educational material to students in a distance form in the most convenient format for them, while ensuring the appropriate level of teaching of the academic discipline.*

*Key words: Medical Chemistry, mixed form of education, online, lecture, Microsoft Teams corporate platform, online education, multimedia presentation, digitization.*

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**THE DEVELOPMENT OF CRITICAL THINKING:  
 WRITING A TERM PAPER VIA FRAME ANALYSIS**

*The paper examines the experience of using the technology of critical thinking through reading and writing, supplemented by a frame analysis when organizing students' independent work – writing a term paper.*

*By frame we mean one of the ways of representing a concept, which, in turn, appears as a mental representation of the picture of the world recorded in the individual's psyche. Frame analysis is considered as one of the ways to develop students' critical thinking.*

*The paper focuses on clarifying the correlation between four key concepts: critical thinking, cognitive theory, constructivism as a learning theory, and frame analysis. The connection between critical thinking and students' independent work is examined. A detailed description of the three-stage model is presented as a technological basis for critical thinking, which is essential and fundamental while writing a term paper. This model reflects the stages of challenge, comprehension and reflection.*

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*At the stage of challenge, students need to familiarize themselves with a certain number of information sources to get a general idea of the topic of the term paper. At this step, which consists in updating knowledge on a certain topic and determining directions for its further study, the use of such a technique as “clusters” is offered.*

*At the stage of comprehension, students process new information, comparing it with the existing one and, thus, master a new structure of knowledge. At this point, the “Logbook” method is proposed. Moreover, frame analysis involves working on the key concept/concepts of a specific topic of the term paper.*

*At the stage of reflection, the received data are interpreted and described, that is, a term paper is created directly. Students in the form of an essay briefly outline the essence of the topic, formulate conclusions and express their points of view on the subject of their researches.*

*Key words: critical thinking, frame analysis, teaching critical thinking, cluster, concept, the stage of challenge, the stage of comprehension, the stage of reflection, term paper, independent work.*

**The statement of the issue.** Critical thinking is increasingly becoming a vital factor in foreign language teaching. As a result, students’ developing critical thinking is considered one of the foreign language teachers’ responsibilities. The teaching of a foreign language at the modern stage is based primarily on the pragmatic application of factual material embedded in linguistic frameworks. The teacher’s task is to expand the horizons of concepts in student’s picture of the world and to teach the possibilities of the language design.

Critical thinking itself and the strategies of its promoting have received much attention in pedagogical circles over the last two decades. The educators note that when using technology for the development of critical thinking, the motivation of students to be active in class increases, which in turn contributes to the achievement of the goals of learning a foreign language.

There are at least three reasons for teaching critical thinking, “firstly, if language learners can take charge of their own thinking, they can monitor and evaluate their own ways of learning more successfully. Second, critical thinking expands the learning experience of the learners and makes the language more meaningful for them. Thirdly, critical thinking has a high degree of correlation with the learners’ achievements” [17, p. 112].

We realize that the critical thinking is a complicated cognitive construct, “with an inductive, deductive and creative nature, comprising an heterogeneous set of skills and necessarily implying the motivation to use them” [4]. Based on this, we assume that learning and training a foreign language with the help of frame connections between individual areas of its application can contribute to students’ critical thinking development. Moreover, frames get a learning opportunity working by students’ participating in critical thinking. And a term paper is no exception as it requires students’ skillfulness to draw up the plan, support their arguments and put themselves in a definite academic framework.

**The analysis of relevant research.** A series of recent studies has indicated that there are certain possibilities of introducing frame technology into the process of teaching a foreign language. Much work on the potential of critical thinking itself and technologies of its developing has been carried out by Ukrainian and foreign educators as well [1; 2; 3; 4; 10; 12; 14; 17]. The essence of English language teaching and trying to outline its importance and richness as a field via an implementation of the concept of “frames” or “framing” to the explanation and analysis of English language teaching work have been carried out by M. Pennington and B. Hoekje [14].

S. Morgunova, for example, believes that “the function of frame technologies in teaching a foreign language is to ensure the implementation of intensive learning of lexical, grammatical and stylistic norms of a foreign language, effective extraction of information, perception and its reproduction in speech” [2, p. 70]. In addition, the use of frames in foreign language teaching enables logic and linguistic modeling of knowledge representation, contributes

to the formation of discursive foreign language communicative competence and the maximum activation of students' mental and personal qualities.

V. Sas, analyzing the two main ways of presenting semantic content or knowledge (declarative and procedural), concludes that in the process of learning a foreign language, both forms of presentation take place: in the form of assimilation of lexical material and its use in the process of formulating thoughts, they both existing in inseparable symbiosis [3, p. 43]. In [10] the authors analyze frame theory and its application to discourse-based English listening teaching paying attention to listening strategies – information prediction and keywords location.

We are sure different aspects of the critical thinking made by the educators create a favourable ground for the description of students' critical thinking development when writing a term paper.

**The purpose of the article.** This paper takes a new look at writing a term paper by means of the frame analysis deeply linked with the technologies of critical thinking development, integrating the process of thinking, the formation of students' communicative abilities, and their skills to work independently.

This paper begins by examining the four key domains in their correlation: critical thinking, cognitive theory, constructivism as a learning theory, and frame analysis. The second section examines the connection between critical thinking and students' independent work. In the third section the case study is presented by detailed description of the three-stage model as the technological basis of the critical thinking, being essential and fundamental for writing a term paper.

**The body of the research. Section 1.** In his analysis of the teacher's knowledge of theoretical frames of learning, F. Lunenburg [12] questions the need for critical thinking, cognitive, and constructivist theories as three broad categories to be considered fruitful both for teachers and students. Critical thinking forces us to abandon the traditional way of learning a foreign language and move to a model that teaches students to think critically. From the perspective of cognitive theory, learning should be oriented towards students being able to learn from their own experience or being able "to add new concepts to their cognitive structure by recognizing the connection between their prior knowledge and what they are learning" [12, p. 1]. Within constructivism, as a trend in education, a student's individuality is his/her ability to build knowledge and meaning while participating in the educational process.

Frame analysis is one of the basic methods of analyzing the specifics of the interaction of verbal and cognitive structures. The study of frames makes it possible to understand the mechanisms of conceptualization of concepts and phenomena of reality objectified in the language, that is why frame analysis becomes relevant not only among linguists, but also among literary critics and representatives of other fields of knowledge. Frames are information data formed in a certain way, which reproduce the knowledge acquired through experience about a certain stereotypical situation (the concept of "situation" has a general meaning, as it can denote an action, an image, a story, etc.) [8]. In other words, a frame is a mount, an angle of view through which information is presented. It is also a way of compactly storing information in the human mind. Thus, the benefit of using the frame analysis is expected to be useful and fruitful while teaching students how to write a term paper.

**Section 2.** We follow the opinion of many scientists that the structure of the educational process should be oriented toward the increasing of students' independent work. It obviously provides an opportunity of developing their intellectual and personal competencies and strengthening internal motivation as well.

Critical thinking can be purposefully formed in the educational process. It allows not only to notice contradictions, shortcomings, gaps in information, but also to analyze various sources in a balanced way, to understand one's own position, to have various strategies for working with information and solving problem situations. Critical thinking requires the teacher's

comprehending in the use of different methods. At the philosophical level, critical thinking implies the possession of various strategies of text interpretation, the acceptance of the fact of the fundamental “vulnerability” of any theory, the fact of the world multipolarity [15].

The majority of prior researches has applied that the technological basis of the critical thinking is a three-stage model (challenge – realization of meaning (comprehension) – reflection (reasoning)), which allows students to help themselves determine the goals of learning and search for information actively [4; 7; 16]. Moreover, we should point out that the technology for the development of critical thinking can be carried out through reading and writing.

At the first stage, the process of actualization of existing knowledge and ideas about the subject of studying takes place in the students’ minds. Since individual and group forms of work are combined, students’ participation in the educational process is intensified, cognitive interest being also formed. The result of these processes is their independent determination of the purpose of further educational activities. At the stage of comprehension, the student comes into direct contact with new information – the carrier of new ideas. It is very important that at this stage, with the help of a number of techniques, the teacher helps students monitor the process of their own understanding of new ideas. The stage of reflection is characterized by students’ consolidating new knowledge and reconstructing their own ideas diligently for new concepts to be included [5, p. 1345].

Most early studies as well as the current work focus on the term “independent work” as the numerous kinds of students’ individual and group activities within or out the classroom. This concept implies the looking through of required information, knowledge achievement and its applying for educational, scientific and professional tasks unfolding. D. Little believes that this type of activity is turned on students’ self-learning. Moreover, “independent work involves the implementation of different tasks of educational, productive, research and self-educational character, acting as a means of mastering the system of professional knowledge, methods of cognitive and professional activity, and formation of skills of creative activity” [11, p. 148].

**Section 3.** Writing a term paper is a long and time-consuming process, during which students have to navigate a huge flow of information on the topic provided to them, so a clear plan of action should be developed when writing a term paper. *At the stage of challenge*, a certain amount of literature should be read by students to obtain a general idea of the topic being studied. At the same time the clustering technique can be offered and presented as well. Generally, it means the primary processing of information in the form of its distribution into groups. “The cluster technique enables writers (students, in our case) to pull apart and dissect their thoughts on a topic, often leading to more details, more personality and ultimately a more interesting take on the subject” [18]. “It is a technique which provides an alternative way for writers to do the brainstorming before starting to write” [19, p. 137].

By means of clustering it is available to disclose possible relations among facts and ideas. Thus, we can conclude clustering is deeply connected with creativity as while constructing a clustering students attempt to come across things linked with the topic. Clustering requires a brief period of initial planning being very important for writing a term paper.

Clustering can also be considered to be another productive method for students to make the subject narrower. Clustering is widely known as diagramming or mapping, hence it is another way of generating material for a term paper. This method is useful for students to visualize data. Therefore, “visualization is a strategy that fosters creativity and critical thinking by allowing one to use their imagination and previous knowledge to activate new ideas and consider a variety of perspectives” [13]. The sample of clustering (mapping) may be seen here [9, p. 19].

*At the stage of comprehension*, students should process new information, comparing it with existing one and develop, thus, a new structure of knowledge. Students may be offered such a technique as a logbook. A. Chateau and H. Zumbihl state that “the introduction

of the logbook into the scheme meant to help learners increase their „critical reflection“ and accept responsibility for their learning” [6, p. 69]. The structure of the logbook is the following: the first column “What do I know about this topic?” (students put down these known them on the topic being studied) and the second one “What new have I learnt from the text / paper/ chapter?” (it is filled with thoughts new to students and the sayings of various researchers within the area being investigated). Thus, newly discovered information received from material processing, as well as recorded in the logbook quotes and comments, contributes to further production of the text of the term paper.

At this stage, the use of frame analysis is possible only after constructing the frame itself. The structure of a frame may be schematically similar to the structure of such a technique as “clusters”, but a frame, being one of the basic terms of cognitive linguistics, itself represents the structure of a concept. A frame is represented by a set of slots at different levels, among which the first-level slots are understood as basic ones, and the second-level slots, which specify first-order slots, are understood as terminal or final slots [10, p. 57].

An example of the use of frame analysis can be considered as the work on the key concept/concepts of a specific topic of a term work. For example, students of the field of knowledge 07 Management and administration, specialty 072 Finance, banking and insurance should pay attention to the object(s) of the study and activity: principles, forms, mechanisms of functioning and development of financial systems. Therefore, we consider it expedient to suggest framing these concepts. For this purpose, students study literature on finance, banking and insurance, and analyze lexicographic sources. During the analysis, these concepts are defined in the field of management and administration. Then students must write out contexts with stated terms from the methodological literature and analyze the contextual meanings of the terms under study.

The frame of the concept of “principles of financial activity”, for example, consists of two levels of slots. The first includes the “principle of legality”, “principle of planning”, “principle of openness”, and “principle of systematicity”. Slots of the second level – “legality”, “planning”, “openness” and “systematicity” correspond to slots of the first level, respectively. Each slot should be represented by a number of contexts where each principle is interpreted in its own way.

*At the stage of reflection*, the interpretation of the received data and their description is carried out; thus, a term paper is created directly. Such a technique as an essay writing can be offered. Students have the opportunity to outline the main points of the topic being studied briefly, formulate conclusions on the work done and express their points of view on a particular subject of their researches.

**Conclusions.** In summary, it has been revealed that the technology of developing critical thinking through reading and writing, especially in its modified form (using a technique of frame analysis), optimizes and promotes the successful writing of a term paper. Frame analysis, being a method for describing the structure of a concept, is possible after constructing a frame itself. The development of critical thinking plays a big role in the formation of universal information processing skills, namely, analyzing incoming information, evaluating it within reliability and using it to solve everyday and professional problems.

Future investigations are necessary to validate the kinds of conclusions that can be drawn from this study.

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### РОЗВИТОК КРИТИЧНОГО МИСЛЕННЯ: НАПИСАННЯ КУРСОВОЇ РОБОТИ З ВИКОРИСТАННЯМ ФРЕЙМОВОГО АНАЛІЗУ

*У статті розглядається досвід застосування технології критичного мислення через читання та письмо, доповненої фреймовим аналізом в організації самостійної роботи здобувачів – написанні курсової роботи.*

*Під фреймом розуміємо один із способів репрезентації поняття, яке у свою чергу постає ментальним уявленням картини світу, зафіксованої в психіці індивіда. Фреймовий аналіз розглядається як один зі способів розвитку критичного мислення здобувачів.*

*У статті акцентується на з'ясуванні кореляції між чотирма ключовими поняттями – критичного мислення, когнітивної теорії, конструктивізму як теорії навчання та фрейм-аналізу. Розглядається зв'язок між критичним мисленням і самостійною роботою здобувачів. Представлено детальний опис тріступеневої моделі як технологічної основи критичного мислення, яка постає суттєвою та фундаментальною в написанні курсової роботи. Зазначена модель відображає стадії виклику, осмислення та рефлексії.*

*На стадії виклику здобувачам потрібно ознайомитися з певною кількістю інформаційних джерел задля отримання загального уявлення про тему курсової роботи. На етапі актуалізації*

знань з певної тематики та визначення напрямків її подальшого вивчення запропоновано використання такого прийому, як «кластери».

На стадії осмислення здобувачі опрацьовують нову інформацію, порівнюючи її з наявною, і таким чином опановують нову структуру знань. На цьому етапі запропоновано прийом «Бортовий журнал». Більше того – фрейм-аналіз передбачає роботу над ключовими поняттями / поняттями конкретної теми курсової роботи.

На стадії рефлексії здійснюється інтерпретація отриманих даних та їх опис, тобто створюється безпосередньо курсова робота. Здобувачі у формі есе стисло окреслюють суть теми, формулюють висновки та висловлюють свій погляд на предмет дослідження.

Ключові слова: критичне мислення, фреймовий аналіз, навчання критичного мислення, кластер, поняття, стадія проблеми, стадія осмислення, стадія рефлексії, курсова робота, самостійна робота.

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## ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНІ ТЕХНОЛОГІЇ В ПРАКТИЧНІЙ ДІЯЛЬНОСТІ ВЧИТЕЛЯ

У статті представлено статистичні дані щодо кількості учнів, які нині навчаються за дистанційною, сімейною та змішаною формами здобуття освіти. Проаналізовано рівень кадрового забезпечення та педагогічного навантаження вчителів в умовах війни.

Важливе значення в таких умовах має впровадження інформаційно-комунікаційних технологій не лише в процес шкільної освіти, а й у процес підготовки вчителів до викладання навчального матеріалу, представлення звітів своєї роботи, у процес їх професійного розвитку, оновлення інформації з навчальних предметів, адже без ґрунтовних знань і умінь швидко й якісно використовувати ІКТ сьогодні не можна підготуватися до уроків повною мірою та підтримувати високий рівень уваги й зацікавленості учнів.

Під час підготовки до уроку з використанням інформаційно-комунікаційних технологій та інформаційно-цифрових ресурсів учителю важливо пам'ятати, що варто сформулювати план уроку, виходячи з його мети і завдань. Під час добору навчального матеріалу варто дотримуватися основних дидактичних принципів, зокрема системності та послідовності, доступності, а також диференційованого підходу.

При цьому комп'ютер є лише доповненням роботи вчителя, а не його основним інструментом для проведення уроку. Завдяки інформаційно-цифровим ресурсам відбувається індивідуалізація навчання, з огляду на інтелектуальні можливості кожного конкретного учня, контроль, підведення підсумків й оцінювання рівня засвоєного матеріалу, що відбувається швидко, об'єктивно та вчасно.

Автором представлено структуру та складові інформаційно-комунікаційної компетентності працівників освіти, аспекти діяльності, які можна виконувати швидше та якісніше завдяки використанню ІКТ. Також окреслено переваги й недоліки їх застосування у сфері освіти.

Ключові слова: інформаційно-комунікаційні технології, учителі, педагогічні працівники, учні, заклад освіти, інформаційно-комунікаційна компетентність.