

English Lexical Competency of Engineering Specialties Students of Nonlinguistic Higher Institutions: The Cognitive Teaching Methods

Nataliia Tymoshchuk

Abstract: *The article deals with the problem of applying cognitive approach to teaching English terminological vocabulary to students of engineering specialties of higher educational institutions. Both the notion of "cognitive approach" and its interpretation by domestic and foreign scientists are considered. A comparative analysis of the formation of the English language lexical competence of students of engineering specialties has been carried out. It is proved that mastering of foreign language professional vocabulary is one of the main components professional foreign language because it increases the educational process efficiency, contributes to the formation of a competent specialist, competitive in modern conditions. It has been proved that the cognitive approach to teaching technical vocabulary significantly improved the students' ability to memorize the new terminological effectively.*

Keywords: *Both the notion of "cognitive approach" and its interpretation by domestic and foreign scientists are considered.*

I. INTRODUCTION

Nowadays much attention is paid to the highly professional training of the future young specialist. It should be noted that mastering of terminological vocabulary is its necessary prerequisite, because accumulation of knowledge involves mastering professional terminology. This point of view is relevant both for special subjects and socio-humanitarian ones. Certainly, English for professional purposes isn't an exception.

It is obvious that the need for communication in a foreign language has increased significantly, and proficiency in a foreign language is the key to a full exchange of scientific and technical information. Nowadays, English is not only a medium of international communication, modern linguists are calling it as a language of intercultural communication, referring to such social fields as politics, international relations, informatics, international (global) logistics and commercial activities. The factors mentioned above have caused considerable interest in English. However, the problem of improving existing and finding new effective methods of mastering foreign terminological vocabulary is scientifically important.

II. SIGNIFICANCE OF THE STUDY

At present, the cognitive approach is actively developing in domestic and foreign psychology, cognitive science, psycholinguistics and linguistics. The problem of cognitive approach in teaching students of English terminology vocabulary is observed in scientific intelligence of both foreign scientists (S.M. Jaeggi, M. Buschkuhl, J. Jonides, P. Shah [1]) and Ukrainian researchers (Bodnar S.V. [2], Borshchovetska V.D. [3], Melnyk R.A. [4], and Naumenko L.P. [5]). However, despite the considerable scientific interest to the notion of cognitive approach in the current psychological and methodological scientific literature, in our opinion, the issues of advantages and disadvantages of the cognitive approach to the study of vocabulary and determine the most effective ways of its acquisition are not fully understood and scientifically sound. The purpose of this publication is to analyze the cognitive approach to the study of professional terminology and to identify the most effective ways of mastering it by developing a system of cognitively oriented exercises for teaching students of non-language institutions of higher education in foreign language terminology.

III. THEORETICAL CONSIDERATIONS

Modern psychological science offers a number of models that analyze the mechanisms of human consciousness and are the basis for the latest didactic methods and tools. We mean the model of Robert Solso cross-sets, that is, the primary verification of the meaning of a word by its basic secondary features [6]; C. Osgood's semantic differential method provides the evaluation of stimuli by a three-component scale: evaluation – force – activity [7]; the model of semantic primitives proposed by the Polish linguist Anna Wierzbicka, who believes that the vocabulary of any natural language can be minimized to a small number of basic words, which will be sufficient to reflect certain categories and understanding the whole world [8]; a spatial and functional model that reveals the process of categorization of concepts, for example, the study of foreign engineering terms by topics; Eleanor Roche's prototype model interprets perceptions based on natural prototypes that are perceived by humans as the best models and are easily remembered [9][10]. It is clear that the current transformation of teaching methods is influenced by psycholinguistic studies, and modern scientists emphasize their cognitive orientation, attracting knowledge from other fields of science.

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Nowadays, scientists are researching and cognitive approach nominated in English-language linguistics as *Whole Language Content Approach*, *Cognitive Approach*, *Cognitive Academic Language Approach*, which aims to activate the human mental mechanisms such as cognition (understanding and awareness), memory, attention, thinking, intelligence [1, p. 239]. It is appropriate to note that the analyzed concept comes from two Latinisms: *cognitio* – cognition and *cognotatio* – thinking, reasoning, so it dualistic combines the process of cognition and mental processes of perception.

Cognitive technology is the educational process of intellectual development of students based on the idea of postoperative management of cognitive activity to achieve the planned learning outcomes [10, p. 151.]. M. Stupak distinguishes such cognitive teaching methods as heuristic observation method, comparison method, fact method, research method, hypothesis method, prediction method, error method and method of constructing theories [11].

According to V. Borshchovetska, who researches the problems of the cognitive approach to the study of vocabulary, the mechanisms involved in the processing of lexical information, as well as ways of assimilation and retention of new lexical information underlie the cognitive approach, which is a characteristic feature of the organization of speech-thinking and thinking study of foreign vocabulary [2]. Thus, teaching a foreign language vocabulary within a cognitive approach is based on the patterns of cognitive activity of students. Cognition is a specific type and form of human activity, because in its consciousness not the material world is modeled, but the result of its reflection. The results of cognition are embodied in the knowledge that drives a person to further their deepening and comprehension, to obtain new knowledge on their basis. Human language is a unique tool for organizing, processing and transmitting information, so the word as its main structural component plays an exceptional role in language development.

Selecting language material for the formation of English-language lexical competence of engineering students on the basis of cognitive approach should take into account the following criteria, i.e. the authenticity of the material, which represents typical scenarios of English-language professional-oriented technical discourse, serves as a source of extension of vocabulary; the presence of typical linguistic models / structures of English-speaking professionally oriented technical texts, terminological units, highly specialized vocabulary; socio-cultural orientation of the material, since the formation of students' lexical competence is inseparably linked to familiarization with American and British communication culture; cognitive value and informative content of materials; the adequacy of future professionals in the field of engineering; compliance with the foreign language teaching program for non-linguistic specialties. Modern scholars consider the use of different teaching methods as a basic prerequisite for improving the effectiveness of foreign language teaching at higher education institutions, offering such forms of organization of educational activities as “aquarium”, “two – four – together”, “brainstorming”, “studying – learning”, “unfinished sentences”, “circle of ideas”, “microphone”, “mosaic”, “court hearing”, “public hearings”, “change position”, simulation games, role play, discussion, discussions, etc.

In our opinion, tasks that correlate with the logical operations of thinking should be used for the conscious study of vocabulary. These include exercises for choosing the necessary lexical information, searching for extra words, grouping, formation of synonymous and antonymic pairs, guessing from the context, solving puzzles and crossword puzzles, language games, associative thinking, solving a problem situation. It is also appropriate to teach students the guesswork of the meaning of the word in context, drawing up associative mental maps and solving problem situations [5, p. 204].

IV. DATA ANALYSIS

We have used cognitively-focused tasks for two months (sixteen lessons) in foreign language vocational training. At the end of the term, control sections of knowledge were conducted. Their results revealed the significant positive changes in the development of students' proficiency in English engineering vocabulary. It should be noted that 19 students (38%) had high results, 10 students (20%) had average results, and 21 students (42%) had low results. Students who studied by researched method had the following results: 29 students (58%) had high results, 17 students (34%) had average results, and 4 students (8%) had low results.

The diagram (fig. 1) contains the educational results of students before and after using the cognitive approach in order to form a professional English-speaking lexical competence. Thus, the results of the tests demonstrated the effectiveness of using the analyzed approach when learning new foreign language lexical material.

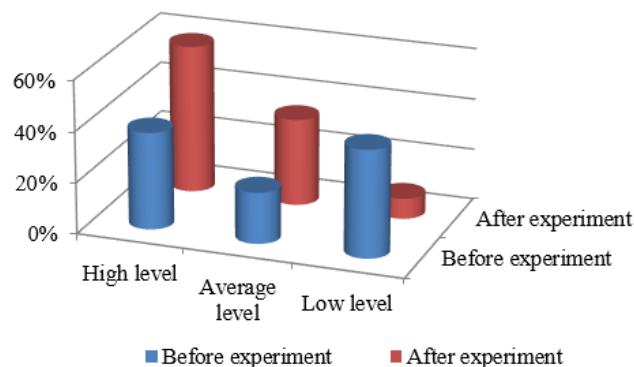


Fig. 1. Comparative analysis of proficiency in English vocabulary

V. CONCLUSIONS

Therefore, it can be argued that the cognitive approach applied to the formation of foreign-language (English) lexical competence is actively developing in modern didactics, so, of course, it is one of the promising areas of conscious learning for students of higher education. Cognition, attention, memory, thinking, intelligence, student identity are the basis for effective learning of a foreign language. The use of a cognitive approach helps to increase the level of knowledge of students, encourages them to actively work independently,



in particular, the selection, understanding and processing of information for its further use in professional activity. Taking into account the objective difficulties in studying technical terminological vocabulary by students, we consider cognitively oriented exercises more effective in combination with such interactive practices as play and problem learning. The didactic expediency of the analyzed approach consists in the organization of active speech-thinking activity of students mastering a foreign (English) professional vocabulary.

REFERENCES

1. Jaeggi, S.M., Buschkuhl, M., Jonides, J., & Shah, P. (2011) Short- and Longterm Benefits of Cognitive Training. Proceedings of the National Academy of Sciences of the United States of America, 108(25), 10081–10086 [in English].
2. Bodnar, S.V. (2014). Kognityvny pidhid do formuvannya leksychnoyi kompetentnosti studentiv ekonomichnykh spetsialnostey [Cognitive approach to forming lexical competence of students of economic specialties]. *Nauka i osvita – Science and Education*, 10, 34–38 [in Ukrainian].
3. Borshchovetska, V.D. (2004). Navchannia studentiv-ekonomistiv angliyskoyi fakhovoyi leksyky [Teaching Students-Economists English Special Lexis]. *Candidate's thesis*. Kyiv: KeivSLU [in Ukrainian].
4. Melnyk, R.A. (2014). Kognityvny pidhid do navchannia spetsialnoyi leksyky studentiv-ekonomistiv [Cognitive Approach to Teaching Special Lexis Students-Economists]. *Naukovyi chasopys NPU imeni M.P. Dragomanova – Scientific Journal of NPU named after M.P. Dragomanov*, 49, 124–129 [in Ukrainian].
5. Naumenko, L., Oliinyk, O. (2018). Kognityvnyi pidkhd u navchanni studentiv anhliiskoi terminoleksyky predmetnoi haluzi "mikroekonomika" [The cognitive approach to teaching students English terminological lexis of the subject field of "Microeconomics"]. *Psykholinguistyka (Filolohiia) – Psycholinguistics (Philology)*, Vol. 24, Issue 2, 236-253. [in Ukrainian].
6. Solso, R. (2001). *Cognitive Psychology*. Boston: Allyn & Bacon. [in English].
7. Osgood, C. E. (1956). *Method and Theory in Experimental Psychology*, Oxford [in English].
8. Wierzbicka, A. (1996). *Semantics: Primes and universals: Primes and universals*. Oxford University Press [in English].
9. Rosch, E. (1973). Natural categories. *Cognitive psychology*. V.4. [in English].
10. Rubtsova, M. (2015). Kognityvno-komunikatyvnyi pidkhd do navchannia leksyky na zaniattiakh z praktyky usnogo movlennia [Cognitive and communicative approach to teaching vocabulary during speech practice classes]. *Naukovyi visnyk Melitopolskoho derzhavnoho pedahohichnoho universytetu. Seriya: Pedahohika. – Scientific Bulletin of Melitopol State Pedagogical University. Series: Pedagogy*. 14. 150-154 [in Ukrainian].
11. Stupak, M.H. (2018). Kognityvni metody navchannia inozemnykh mov u VNZ [Cognitive methods of teaching foreign languages at universities]. Proceedings from 14th International Scientific Internet Conference "Advanced Technologies of Science and Education": Retrieved from: <http://intkonf.org/stupak-mg-kognityvni-metodi-navchannia-inozemnih-mov-u-vnz> [in Ukrainian].