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AN EXPERIMENTAL STUDY OF THE EFFECT OF LEXICAL SEMANTIC MODELS IN TEACHING VOCABULARY IN EFL

Abstract

The present study aims to investigate the effect of lexical semantic models based on semantic fields on students` foreign vocabulary acquisition and word mastery. The research design of this study is based on experimental teaching, modeling, observation, and post experimental testing. Thirty-two 11th grade students of one of the schools-lyceums in Astana city participated in this study in academic year 2021-2022. This study explored learning process of two groups: experimental group and control group. In order to collect data about students' vocabulary mastery and lexical skills we used vocabulary tests and observation. Both groups received various treatments. During the treatment students in experimental group learnt new words in paradigmatic and syntagmatic relationship via semantic models based on field which included definitions, synonyms, antonyms, collocations, while students in the control group used the wordlists strategy which included a list of ungrouped words and translations into L1. The research results has shown that learning words based on lexical semantic models based on semantic fields is more beneficial for students comparing to wordlist strategy, as it facilitates better memorization and vocabulary retention, significantly enriches learners' vocabulary through synonyms and antonyms, improves understanding of word relationship and correct word usage and collocations in different contexts and enlarges learner's active vocabulary.

Keywords: lexical semantic field, modeling, experiment, vocabulary acquisition, paradigmatic, syntagmatic, lexical skills.

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АҒЫЛШЫН ТІЛІ САБАҒЫНДА ЛЕКСИКАНЫ ОҚЫТУДА ЛЕКСИКАЛЫҚ-СЕМАНТИКАЛЫҚ МОДЕЛЬДЕРДІҢ ӘСЕРІН ЭКСПЕРИМЕНТТІК ЗЕРТТЕУ

Аңдатпа

Аталмыш зерттеудің мақсаты семантикалық өрістердің негізінде құрылған лексикалық-семантикалық модельдердің жоғары сынып оқушыларының шет тіліндегі сөздерді меңгеруіне әсерін зерттеу болып табылады. Аталмыш зерттеуде эксперимент, модельдеу, бақылау және тестілеу сияқты эмпирикалық зерттеу әдістері қолданылды. 2021-2022 оқу жылында осы зерттеуге Астана қаласының мектеп-лицейлерінің бірінің 11-сыныбының отыз екі оқушысы қатысты. Бұл зерттеуде эксперименттік және бақылау топтарының шеттілдік сөздерді меңгеру үдерісі зерттелді. Оқушылардың сөздік қорын және лексикалық дағдыларын меңгеру туралы мәліметтер жинау үшін тесттер мен бақылау қолданылды.

Екі топта оқу үдерісінде түрлі тәсілдер қолданылды. Эксперимент барысында эксперименттік топтың оқушылары жаңа шеттілдік сөздерді анықтамалар, синонимдер, антонимдер мен сөз тіркестерін қамтитын парадигматикалық және синтагматикалық қатынастар арқылы байланысқан, семантикалық өріс негізіндегі лексикалық-семантикалық модельдер арқылы оқыды, ал бақылау тобының оқушылары топтастырылмаған аудармасы бар сөз тізімдері арқылы оқыды. Зерттеу нәтижелері семантикалық өрістерге негізделген лексикалық-семантикалық модельдер арқылы сөздерді оқыту тиімдірек екенін көрсетті, өйткені модельдер сөздік қорды жақсы есте сақтауға ықпал етеді, синонимдер мен антонимдер арқылы оқушылардың сөздік қорын айтарлықтай байытады, сөздердің өзара байланысын түсінуді жақсартады және әр түрлі контексте дұрыс сөз бен сөз тіркестерін қолданып, оқушының белсенді сөздік қорын кеңейтеді.

Түйін сөздер: лексикалық-семантикалық өріс, модельдеу, сөз меңгеру, моделирование, эксперимент, сөздік қор, парадигматикалық, синтагматикалық, лексикалық дағды.

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ЭКСПЕРИМЕНТАЛЬНОЕ ИССЛЕДОВАНИЕ ВЛИЯНИЕ ЛЕКСИКО-СЕМАНТИЧЕСКИХ МОДЕЛЕЙ ПРИ ОБУЧЕНИИ ЛЕКСИКЕ НА УРОКАХ АНГЛИЙСКОГО ЯЗЫКА

Аннотация

Целью данного исследования является изучение влияния лексико-семантических моделей, построенных на основе семантических полей, на усвоение иностранных слов старшеклассниками. В данном исследовании использовались такие эмпирические методы исследования, как эксперимент, моделирование, наблюдение и тестирование. В 2021-2022 учебном году в данном исследовании приняли участие тридцать два ученика 11 класса одной из школ-лицеев города Астана. В данном исследовании изучался процесс обучения лексике экспериментальной и контрольной групп. Тесты и контрольные работы использовались для сбора данных об овладении учащимися словарным запасом и лексическими навыками. В двух группах в учебном процессе использовались разные способы. В ходе эксперимента учащиеся экспериментальной группы изучали новые иноязычные слова с помощью лексико-семантических моделей на основе семантического полей, связанных парадигматическими и синтагматическими отношениями, включающими определения, синонимы, антонимы и словосочетания, а учащиеся контрольной группы обучались новой лексике с помощью не сгруппированных списков слов и их переводов на родной язык. Результаты исследования показали, что обучение иноязычным словам с помощью лексико-семантических моделей более эффективно, поскольку модели способствуют лучшему запоминанию словарного запаса, значительно обогащают словарный запас учащихся с помощью синонимов и антонимов, улучшают понимание взаимосвязи слов и расширяют активный словарный запас учащихся, что способствует правильному употреблению слов и словосочетаний в различных контекстах.

Ключевые слова: лексико-семантическое поле, моделирование, овладение словом, моделирование, эксперимент, словарный запас, парадигматический, синтагматический, лексический навык.

Introduction. One of the main difficulties of teaching a foreign language is poor vocabulary acquisition and vocabulary memorization which further leads to poor communicative skills in a foreign language. Therefore, school teachers are constantly searching for better practices and effective ways in teaching foreign vocabulary, since even simple communication cannot be achieved without certain vocabulary. Lexical knowledge does not only provide

a set of language rules about a word in a foreign language, but also knowledge and strategies of word use for effective and smooth communication in a foreign language. Vocabulary is the central part of the language that expresses forms and transmits knowledge about any objects and phenomena. Thus, vocabulary teaching and acquisition is an integral part of foreign language teaching. S.Thornbury states that all the words learnt by the students are stored not randomly, but in an highly organized and systematic way that reminds more a web or network, than a dictionary or a list of words which is called mental lexicon [1]. Vocabulary knowledge is a complex structure involving multiple components [2].

The experience of teaching practical English indicate and diagnostic and summative test results indicate that high school students have not sufficiently developed their lexical skills. As a result, students face challenges in expressing themselves in speaking and writing, for students challenge choosing a specific or a certain word to express their thoughts, make mistakes in collocating the words, hardly can distinguish synonyms, or paraphrase their ideas using antonyms, and their speech often lacks expressiveness. Adequate vocabulary acquisition would help learners to overcome difficulties in correct word usage, collocating words, enlarging vocabulary in mind, and enriching vocabulary to express them skillfully and correctly. In this regard, the effective presentation of lexical unit leads to effective acquisition, and enable to make the learning process engaging and motivating.

In this study we have developed an experimental design based on the following research question: *What is the effect of lexical semantic models based on lexical semantic fields on English vocabulary acquisition?*

Literature review. In applied linguistics and methodology of teaching English there exist a number of empirical studies aimed to study the effectiveness of vocabulary teaching and learning techniques and improving the lexical skills in oral and written speech of students using lexical semantic field as systematic vocabulary grouping. These issues are reflected in the works by Indriarti, I. [3], A.K. Meirbekov, B.G. Abzhekenova [4], Varlamova E.V. [5], Nordquist R. [6], Boran G. [7], Sathientharadol P. [8] and others. While analyzing some literature related to lexical semantic field and its application in teaching foreign languages we discovered that researchers use terms such as lexical semantic schemes, models, map referring to one and the same concept which is defined as a graphic (visual) organization of words showing the relationship between words and categorize word meaning based on semantic fields. According to this theory some words could form a semantic field under a common concept. In this research we restrict our focus on J.Trier's [9] version of field-theory who introduced this term. According to C.Wangru [10] a linguistic field composed of a list of incompatible words referring to items of a particular class. According to C.Wangru if we take "Kinship" as an example, father, mother, grandfather, grandmother, brother, sister, cousin, nephew, etc., form a semantic field. If we want to know the meaning of "cousin", we should be clear about the relationship between cousin and other relatives. Moreover, we must also know the position of "cousin" in the field [10].

Yu.Karaulov [11] defines the semantic field (SF) is the largest semantic paradigm that unites words of different parts of speech, the meanings of which have one common semantic feature. For example, the field of movement includes the words *go, run, walking, running, swimming, arrival, bouncy, frisky, skipping,* etc. Lexical semantic field (LSF) is a complex lexical microsystem, which combines the words according to the semantic principle and possesses a specific field structure. Lexical semantic field consists of micro fields. According to Yu. Karaulov [11] lexical semantic field is a broad concept which includes the problems of lexicology such as antonym, synonymy, polysemy, and word and concept correlation.

P. Sathientharadol in his research claims that using semantic fields to vocabulary teaching and learning could be an option to improve the learners' ability in studying vocabulary effectively, because after 1 month of using the semantic field to teach English vocabulary

for his students, it was found that the students performed statistically better in the post-test [8].

K.Meirbekov, B.G. Abzhekenova define the mind map as well developed method of vocabulary teaching which is a visible construct of new vocabulary. Vocabulary maps are also called dictionary maps and are organized to show grouping or word relationships. A mind map is also defined as a diagram that brings information together in a circular structure around a major topic or idea. Instead of text consisting of sentences, mind diagrams display information in the form of keywords, short phrases, and images [12].

Main body. Thirty-two 11th grade students in Kazakh-language High school (17 females, 15 males) of one of the schools-lyceums in Nur-Sultan city (Kazakhstan) participated in this study in academic year 2021-2022. In Kazakhstan, a school-lyceum is defined as a school with a deep study focus on some subjects such as physics, mathematics, and natural sciences. The testees' age ranged between 16 to 18. The experimental group of high school students consisted of 16 testees, including 7 males and 9 females. The control group consisted of 16 students as well, including 8 males and 8 females. All students have been learning English as a compulsory subject for nine years in primary and secondary schools. All the experiment participants volunteered to take part in this research and agreed to be observed during their study in EFL classes. Before starting the experiment and dividing the participants into experimental and control groups all participants had already passed the Oxford placement test, and were homogeneous and defined as intermediate level.

Methods. The present research employs methods of experimental teaching, modeling, observation, post experimental testing and qualitative and quantitative analysis of data. In this study we have used 'true' experimental design, namely the pre-test-post-test control and experimental group design. According to L.Cohen et al. [13] the main feature of experimental research is that researchers deliberately control and manipulate the conditions that determine the events in which they are interested, introduce an intervention and measure the difference that it makes. For data collection we used Google Forms and for statistical data analysis and validate the results of the study we applied ANOVA test.

Before starting treatment and an experimental and control groups individually completed pretest created in Google Forms. The purpose of the pretest was to determine students' prior lexical knowledge, if they can recognize and define the words, find synonyms and antonyms, to collocate the words correctly. The words were chosen from ESL textbook and curriculum to assure they had not already been taught particular words. The pretest was administered one week before the experimental study started.

The study used a two-group pre-test, post-test design, and summative assessment test results. The experimental teaching was conducted to test and identify the effect of implementing lexical semantic models based on semantic fields in the English language vocabulary acquisition. During one term which included 16 English language classes, experimental teaching using lexical semantic models was conducted in the experimental group and control group was educated traditionally using wordlist in presenting and practicing foreign vocabulary. I. Indriarti [3] defines wordlists strategy as one of the traditional strategies in teaching vocabulary, is a strategy which provides list of some difficult words and their meanings. When using this strategy a teacher directly demonstrates the target words to the students, then ask them to read and memorize the vocabulary items. This strategy is beneficial for the students to remember new words but in a short time, but fails to master the target vocabulary better.

Before the experiment started all thirty-two participants volunteered to participate in this research and gave their consent.

The posttest was paper-based and assessed learning of the same words each group was exposed to in the study. Also the results of the summative assessment of the unit were analyzed to explore the effect of lexical semantic models on general language acquisition and learning outcomes. After the experiment the post-tests were administrated to explore if any significant

changes occurred in learning vocabulary between the two groups.

The present study uses modeling as research methods in applied linguistics. Mostly the term "model" is defined as a type, sample (language pattern) of any text units (words, sentences); symbols, schemas for describing language objects (the schema of the component model in the syntax). According to O.S. Akhmanova modeling is a research method which consists in the schematic reproduction of an object that is difficult or cannot be directly observed [14]. The method of modeling is helpful in all those scientific fields where the object of science is inaccessible to direct observation.

According to K.L., Kabdulova K.L., M.L.Bolatbaeva an integral part of the modeling method is the construction–bringing various objects, parts, and elements into a certain mutual position [15].

Thematic texts from textbooks, workbooks for the 11th grade students and monolingual dictionary Concise Oxford Thesaurus [16] served as sources of the lexis choice for lexical semantic fields. According to E.V. Varlamova et al. [5] such texts enable teachers to sort out lexical units around which is appropriate to form a lexical semantic field to describe a notion more fully. These textbooks and dictionary was the basis for change the linguistic models of semantic fields, which enable teachers to sort out the lexis for a lexical semantic field on the basis of paradigmatic, synonymic, antonymic, derivational and syntagmatic (syntactic and lexical) relations. Such models based on semantic fields promotes students' deep understanding about lexical units and how to use them while doing various lexical semantic, written and oral exercises and enrich their vocabulary. See Fig.1.

Teaching materials and content in both groups were created and implemented strictly according to the State Educational Curriculum and the same coursebook "Action for Kazakhstan" for 11 grade students by Jenny Dooley & Bob Obee [17] published in 2020 recommended for High school students with mathematical and technical study focus. Supplementary materials for teaching vocabulary were chosen by considering the criteria of difficulty and relevance. To stimulate the participants and to increase students' motivation, interesting and appropriate activities were selected from the book "Oxford word skills (Intermediate)" and 'English vocabulary in use' (Intermediate). to practice and vocabulary and improve lexical skills. A total number of 100 words were selected from the above-mentioned sources. 2 modules were studied throughout the whole experimental study throughout 10 sessions.

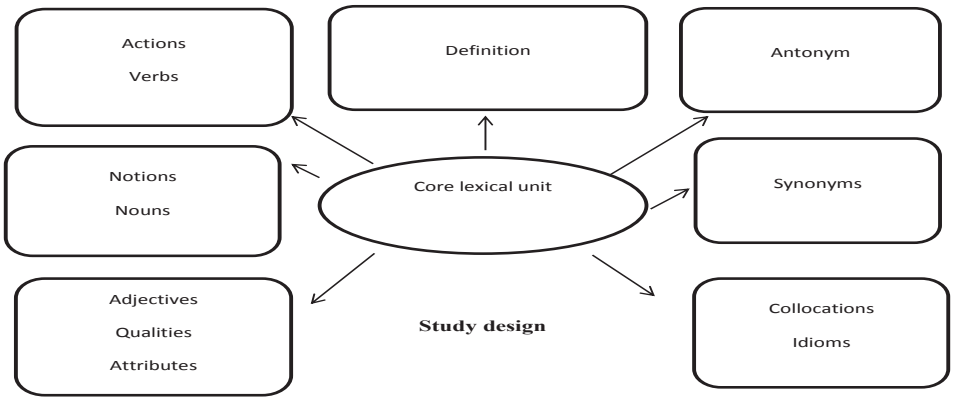

Figure 1. **The structure of lexical semantic model based on semantic field**

Results. At the beginning of the study the pre-test was held in both groups. It had a purpose to identify the early condition of the students' vocabulary knowledge before starting an experiment. It was conducted on Monday, September 8th, 2021 for control group

and on Wednesday, September 10th, 2021 for experimental group. As a pre-test a 20-item multiple-choice vocabulary test was administered. (See Table 1). Each item included one English word which was selected from the learners' course book. The participants were asked to choose the correct word. The average time to take this test was about 20 minutes. This pre-test also helped us to identify that the learners have not learnt the selected words before treatment.

Table 1. **Analysis of students' pre-test results on vocabulary knowledge**

SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Control group	20	74	3,7	1,063158		
Experimental group	20	64	3,2	0,694737		
ANOVA						
Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Between groups	2,5	1	2,5	2,844311	0,099892443	4,098171731
Within groups	33,4	38	0,878947			
Total	35,9	39				

The analysis of the pre-test taken before experimental teaching has started demonstrates that both groups: experimental and control group has approximately the same level of knowledge of vocabulary, average number of correct answers (control group gained 3,7 of correct answers, whereas experimental group gained 3,2). So, we concluded that two groups had equal level vocabulary mastery before starting the experiment. This results indicate that majority of students are not familiar with the words presented in the vocabulary knowledge test which served as a pre-test in our research.

After a pre-test was conducted 32 intermediate level learners were randomly placed in one of two classes: a control group class (16 students) and an experimental group class (16 students). The classes met twice a week for forty-five minutes.

The control group class implemented wordlists strategy (traditional method where a list of vocabulary is presented using definitions and translations into L1), whereas experimental group class used lexical semantic models in teaching vocabulary.

Lexical units for the learners in the experimental group were presented based on the model presented in Figure 1. according to the topics and modules.

Each group received different treatment. Initially, vocabulary in the main course book is not presented in lexical semantic field relationship and does not contain lexical semantic models. The vocabulary is presented in unrelated wordlist in the boxes. Therefore, lexical semantic models were constructed based on semantic and paradigmatic relationship around the core lexical unit in the experimental group, and a control group used the ready words of lists in the course book.

Treatment lasted over 10 sessions. The participants took part in their English class two times a week. Each session lasted about 45 minutes. Each group of participants received a different treatment. The treatment consisted of the two different techniques of vocabulary instruction: (1) Lexical semantic models, (2) vocabulary list technique.

At the end of the experimental period, two post-tests (vocabulary tests) were administered to investigate the effects of lexical semantic models and wordlist strategy on vocabulary acquisition and word mastery. The collected data were organized and submitted to statistical analysis. Data were analysed using two separate one-way ANOVA procedures, one to investigate the effects of lexical semantic models on learning synonyms, and antonyms, and the

other test aimed to measure the effects of lexical semantic models on students' word mastery and word usage including collocations. The post test was given on Monday, October 25th 2021 and on October, 27th 2021 for both groups. The post-test results of both group are shown in the tables below. (See Table 2 and 3)

Each vocabulary test consisted of 20 multiple-choice items. The items were based on the target words chosen at the beginning of the experiment. The allocated time for the test was 20 minutes.

Table 2. **Analysis of post-test (Students' knowledge on synonyms and antonyms)**

SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Control group	20	239	11,95	4,681579		
Experimental group	20	352	17,6	1,094737		
ANOVA						
Source of variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between groups	319,225	1	319,225	110,5289	8,34022E-13	4,098171731
Within groups	109,75	38	2,888158			
Total	428,975	39				

Table 3. **Analysis of post-test (Students' knowledge on word usage)**

SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Control group	20	250	12,5	4,052631579		
Experimental group	20	338	16,9	1,147368421		
ANOVA						
Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Between groups	193,6	1	193,6	74,46153846	1,73843E-10	4,098171731
Within groups	98,8	38	2,6			
Total	292,4	39				

According to the results of the post-test presented in Table 2 semantic models had a significant effect on learning synonyms and antonyms of the words. Control group test result shows average number of correct answers 11, 95, whereas an experimental group where vocabulary learning was based on lexical semantic models and fields average results shows 17,6 mastery. Data analysis shows that F is 110,5 which bigger than F crit 4,098 which indicates that there is a significant difference in groups results and H_0 is not accepted.

Data analysis of Table 3 similarly proves that an experimental group benefited from learning vocabulary through lexical semantic models and fields, as the results shows that learners demonstrated better results in post-test designed to test students' ability to choose the right word

and use the words correctly in the sentences and contexts. The average results of a control groups is 12,5, while an experimental groups' average score is 16,9. Table 2 also shows that F is 74,46153846 and F crit is 4,098171731, this indicates that the results of both groups are not equal.

Discussion. Moreover, during the observation it became clear that experimental group acquired new foreign vocabulary more systematically and effectively compared with the control group which gained lower percentage of vocabulary acquisition and word mastery. Post-test result shows that students in the experimental group after getting treatment by using lexical semantic models showed better results in vocabulary acquisition and improving lexical skills such as using the precise meaning of the word, differentiating the meanings of synonyms, collocating the words correctly, and being able to define foreign vocabulary. Based on these results it can be concluded that lexical semantic models were more effective to improve students` vocabulary mastery than wordlists strategy through translations into L1.

According to V.N. Renata [18] semantic mapping is one of the best approaches in teaching vocabulary in order to make students recognize about the relationship of the word. The results of the similar research made by Renata (2018) proved that semantic mapping strategy can enrich students' vocabulary well. It was concluded that there is an improvement of students' grade from the first to the second cycle, and enrich students' knowledge of words.

B. A. Mudogo in his similar research also states that semantic field theory approach is an excellent teaching strategy, though he recommends to use SFT approach when necessary in teaching English and follow the rules of the two languages in EFL classroom to reduce negative transfer and to enhance L2 acquisition [19].

According to D. Assanova, M. Knol. the monolingual means which disclose the meaning of a word in the foreign language include context, definition, visibility, synonyms, antonyms, word-forming elements that can provide a linguistic guess and lead to comprehension [20].

A.Vakilifard et. al in their related research also identified that semantic mapping had the most positive effect on word learning. They state that semantic mapping may act a graphic memory aid and as the strategy which involve learners' collaboration and active participation in the assignment [21].

Based on the data collected and the result of this research, it can be concluded that students' vocabulary mastery was improved. The improvement can be seen through the pre-test, post-test results.

Lexical semantic exercises based on semantic fields aim to teach students to follow the lexical norms such as:

- Correct usage of semantics;
- Correct lexical combinability and collocations;
- Adequate use of antonyms and synonyms;
- Correct word choice and logical use in a sentence;
- Following stylistic norms in word usage.

The results of the experiment on implementing lexical semantic models allow students to systematize their answers, and provide ideas using necessary vocabulary.

It is a common fact that all vocabulary represents a system associated with certain semantic meanings which include related groups such as synonyms, antonyms, lexical semantic and thematic groups, associative and functional fields. Using lexical semantic models facilitates students to learn not only separate lexical units, but also phrases, idioms, and collocations. Students start using new words correctly in a speech in case students were initially introduced with a new vocabulary correctly. When students see two words are often used together in the sentences or a context, they learn how words should be collocated in a foreign language.

Conclusion. The results of the experiment demonstrated that lexical semantic models based lexical and semantic fields facilitated students to develop the following skills:

a. Correct word usage in context and a sentence;

b. Ability to define and interpret words correctly;

c. determining the semantic shades of meaning by means of learning synonyms;

d. Enriching vocabulary by means of learning antonyms and synonyms of a new word related to the topic;

e. To develop associative thinking, improving memory;

f. students mastered vocabulary knowledge by means of idioms and collocations.

g. learners learn how words are interrelated.

Lexical semantic models can facilitate teaching monologue and dialogic speech, and develop speaking skills as students apply ready models in their speech related to the topic. Additionally, it was proved that lexical semantic models created which are based on semantic fields proved to be an effective method in teaching vocabulary providing faster vocabulary acquisition, enlarging vocabulary, expanding word stock, developing lexical competence and skills of students. Moreover, lexical semantic models enable students to use prior knowledge through the categorical arrangement of word concepts, and affect substantially and positively general vocabulary knowledge.

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КИБЕРВИРТУАЛЬНАЯ СРЕДА КАК ПЕДАГОГИЧЕСКОЕ СРЕДСТВО ФОРМИРОВАНИЯ КРЕАТИВНОСТИ БУДУЩИХ ИНЖЕНЕРОВ

Аннотация

Данная статья отражает особенности интеграции информационных ресурсов в систему высшего профессионального образования как необходимое педагогическое условие становления инженера двадцать первого века. Освещает вопросы актуализации формирования креативности будущего инженера посредством цифровых технологий в кибервиртуальной среде, расскрывает важность проникновения IT -технологий в подготовку будущего специалиста, возрастание роли внедрения онлайн-форм обучения в образовательные процессы расширяющего возможности формирования креативности будущего инженера, способного создавать инновационные инженерные продукты. Представлены плюсы использования данных цифровых технологий в образовательном процессе. Рассмотрены новые средства онлайн обучения студентов, которые в будущем будут конкурентоспособны и востребованы на рынке труда.

Теоретический анализ научной литературы, нормативно-правовых документов и собственный опыт автора, позволили выделить современные тенденции профессионального образования будущих инженеров в эпоху цифровизации, определить их направленность на научный поиск с целью создания инновационных технологических решений с применением IT-технологий; формирование навыков информационного поиска, IT-компетенций; интеграцию науки; образования и производства, путем