

DIDACTIC FUNCTIONS OF EDUCATIONAL TEXTBOOK FOR SPECIAL COURSE OF PROFILE TECHNOLOGY TRAINING OF ENGINEERING AND TECHNICAL ORIENTATION

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The article deals with the peculiarities of designing the content of the special course for profile technology training. A number of innovative ideas, methods and approaches were formulated, a structural and functional model was developed, which formed the scientific and theoretical basis for the content designing of the textbook of the special course of engineering and technical orientation “Designing and Constructing of Engineering Objects”. The importance of the special course content was substantiated for pupils’ formation of the design and technological competence, creative technical potential, ensuring the conscious choice of pupils for their future professional activity of engineering and technical orientation.

The pedagogical conditions and methodical peculiarities of the content implementation of the special course in the educational process of the lyceum (senior school) were determined on the basis of the competent approach.

The peculiarities of the use of the special course were revealed in the educational process in a complex with the profile subject and as a separate course of choice.

The importance of the multifaceted and wide-ranging methodical apparatus of the manual for the special course were substantiated for the thorough mastery of pupils with the content of the special course “Designing and Constructing of Engineering Objects”, and the effective fulfillment of the profile training tasks according to its content.

The mechanism of quality control of pupils’ knowledge on the basis of design and development activities was determined.

The results of experimental testing are presented in order to find out the effectiveness of the manual content of the special course for profile training in technology engineering.

Key words: profile technology training, special courses, design and technological competence, designing of content, scientific basis, conscious choice of profession, pedagogical conditions, methodical peculiarities, methodical apparatus.

Formulation of the problem. In the process of Ukraine's integration into the educational, economic and cultural space of Europe, specialized technological education, its content is one of the most pressing problems of the theory and practice of modern school education in Ukraine. In the conditions of the development of highly informative and high-tech societies, the introduction of a new model of profile technological education into the educational process, which is based on the trends of technological education of economically developed countries and the principles of personally oriented, competence and activity approaches, becomes of great importance.

Ukrainian society is developing in the period of scientific and technological progress, the development and introduction of the most advanced technologies and technologies in all industries of industrial production. The successes of Ukrainian scientists, designers, technologists and manufacturers are significant in the most science-intensive industries — aviation, space and military. Therefore, the preparation of a new generation of scientific and technical specialists to ensure the engineering and technical future of Ukraine is one of the priority tasks of national importance.

Taking into account the above, it is very necessary to carry out profile training of pupils of the lyceum to the basics of design and development activities, which would ensure a conscious choice of faculties and higher educational institutions of *engineering and technical orientation* and prepare to master the necessary professions for the country. In the process of positive solution of this problem special role belongs to special courses, the content of which will help to acquire by pupils' knowledge and skills on the basics of designing and constructing of objects of technology, the formation of their design and technological competence, which involves the creation of training manuals of special courses with appropriate contemporary content.

It should also be taken into account that in today's conditions of development of society, the independent creative activity of pupils in the field of technology becomes of great significance. Therefore, the role of teaching aids in the engineering and technical direction that would adequately perform the functions of a teacher is substantially increasing. From a passive medium, the manual should become an active didactic system that would provide pupils with an independent solution to their creative tasks, self-control, self-examination, the formation of their creative personality, their subject-specific design and technological competence and key competencies. As it comes to the core technology training, the content of this manual should provide a conscious choice

for pupils of their future engineering and engineering profession. Therefore, the main purpose of the content of the manual should be the formation of technologically educated personality, prepared for independent living and active transformation activities in a modern high-tech information society.

Thus, the creation of a manual for a special course, the content of which would ensure the solution of the above objectives of profile training technology engineering is extremely important.

Analysis of recent research and publications. A considerable number of scientific papers of scientists of the Institute of Pedagogy of the National Academy of Sciences of Ukraine [1-6; 12; 13] are devoted to the development (improvement) of the structure and content of textbooks as the basis of the methodical system of competence-oriented learning, the study of the competence of textbooks and their importance for the tasks of the New Ukrainian school, the consideration of the textbook as a means of developing communicative competence of senior pupils, etc. In particular, the peculiarities of the structure and content of textbooks and special courses for profile education were considered [1; 2]. Theoretical and methodological principles and methodical peculiarities of designing the profile subjects content of the technological profile of senior high school pupils' training [8; 9; 10] have been developed. The peculiarities of the development of scientific and methodological support of the content main components of the profile technology training in the professional lyceum [11] have been revealed.

The stages of creation of modern textbooks and manuals [7] have been determined.

1. Awareness of didactic controversy in the educational process, the solution of which is not ensured by well-known educational literature (there is a need to resolve this contradiction).

2. Formation of the ideal image of the process of creating educational literature. At this stage (the stage of synthesis), creative activity is multidimensional. It is analytical, combinatorial, reproductive, problematic-oriented with the entry to the creative level of designing — obtaining objectively new information content, that is, obtaining new system properties of the projected image of the process and its result.

3. Working design as an implementation of the ideal model (creating a maintenance manual).

4. Making a textbook as an instrument of pedagogical technology — a means materializing the ideal image, which was developed in the previous stages. The type of activity of the training designer at this stage is mainly reproductive, that is, according to known rules and technologies.

Scientists devote a great importance to the methodical apparatus of the textbook, which must meet the following requirements [7]:

- facilitate the formation of pupils' technological and technological competence;
- to take into account the peculiarities of pupils' perception of the relevant educational material;

- encourage pupils to perform a variety of mental activities;
- intensify the imagination and fantasy of pupils, enrich their emotions;
- to deepen and specify the knowledge acquired earlier, to constantly associate new ones with those already acquired;
 - to ensure the diversity and gradual complication of the forms and methods of students' educational activity, its purposefulness and perspectives;
 - to formulate questions and tasks concretely, clearly, clearly for pupils, stylistically competent;
 - to determine the number of questions and tasks in accordance with the amount of time allocated to studying this material.

An analysis of literary sources makes it possible to draw the following conclusion. There is a significant number of scientific works that address a wide range of problematic issues for creating textbooks and manuals. However, scientific works, which would solve the problem of creating teaching aids special courses engineering and technical direction for profile technology training and the effective implementation of their content in the educational process are completely absent.

Formation of the purposes in the article. The purpose of the article: to highlight the peculiarities of designing the content of the textbook of the special course for the profile training of engineering technology and methodical features and pedagogical conditions for the implementation of the created content in the educational process of the lyceum (senior school).

Main part.

1. Contents of the manual, pedagogical conditions and methodical peculiarities of its realization.

In general, the effectiveness of the structure and content of the manual for profile training of technology of students of the lyceum depends to a large extent on innovative ideas, methods, approaches (first of all competent) that are used in the process of its creation, the application of simulation processes, etc., which is scientific and theoretical basis for creating the contents of the manual. Equally important in the content of the manual is the availability of developed methodological approaches for the effective implementation of its content. Of particular importance is all this in the process of designing the contents of the manual for a special course for profile training technology engineering. In the context of the above consider the features of designing the contents of the textbook of the special course "Designing and Constructing of Engineering Objects" and the implementation of its content in the educational process of the lyceum (senior school).

First of all, it should be noted that the content of the special course should ensure the formation of the subject design and technological competence of pupils, their creative personality, creative technical potential. Since the special course is intended for profile training of technologies, its content should maximally promote professional self-

identification and self-realization of pupils, conscious choice of their future professional activities engineering and technical direction. This can be ensured provided: the content of the special course will maximally disclose the peculiarities of the professional activities of specialists in the field of technology, including information on the life and creative activities of prominent designers and scientists, etc.

In order to design the modern content of the manual of the special course of engineering and technical direction, which could ensure the effective fulfillment of the above-mentioned tasks, the following innovative (conceptual) idea is formulated, first of all: "Teaching of lyceum pupils to the basics of designing and constructing objects of equipment at the profile level should be carried out on the content of the main types of technical creativity of specialists (design, design, rationalization, invention), differentiated to the level of students ". The idea is based on the content of the program and manual of the special course for the profile training of technology engineering and technical direction " Designing and Constructing of Engineering Objects" and became *a content line* of structuring its teaching material.

A number of other ideas have been used to provide pupils with a conscious choice of their future profession, related to the technique and creative approach to performing production tasks, higher education institutions of engineering and technical guidance in the process of designing the content of the manual. In particular, the following ideas became important in this context: to maximally illustrate in the content of the manual the professional activity of specialists and other training material of the production plan; to disclose the peculiarities of the professional activity of specialists related to the design and construction of new technical objects and the rationalization and invention related to these processes; use the content of educational information that reveals the tasks and responsibilities of specialists, qualification requirements for their profession; information about the life and activities of prominent designers and scientists, etc.

Designing the modern innovative content of the special course of engineering-technical direction also requires model support. For this purpose, a structural and functional model of the design technology was created. It contains 2 main blocks: conceptual-methodological and procedural. The first of them includes: the scientific basis and methodological aspects of designing content, operational-content and productive blocks. The process unit contains the main stages of designing the content: theoretical, design, reflexive, technological, experimental and implementing (Pic.1, See page 258).

Let's consider another aspect of the problem of creating teaching aids for special courses of engineering and technical direction.

As you know, the core of the technological profile content of senior high school pupils is profile subjects and special courses. Profile subjects are designed to realize the goals, objectives and content of each particular profile, which are studied deeper and wider than is provided by the educational standard. Special courses reflect the specifics of a specific training profile and, together with the profile, determine its es-

sence. They should provide in-depth and expanded study of the content of individual sections of profile subjects, may include additional related sections, the content of which orientates the students to a set of possible professions in line with the chosen education profile, etc.

Theoretical and methodological principles of creation of specialized subjects of the educational branch “Technologies”, designing of their content, etc. in the department of technological Institute of Pedagogics of National Academy of Sciences of Ukraine have been developed.

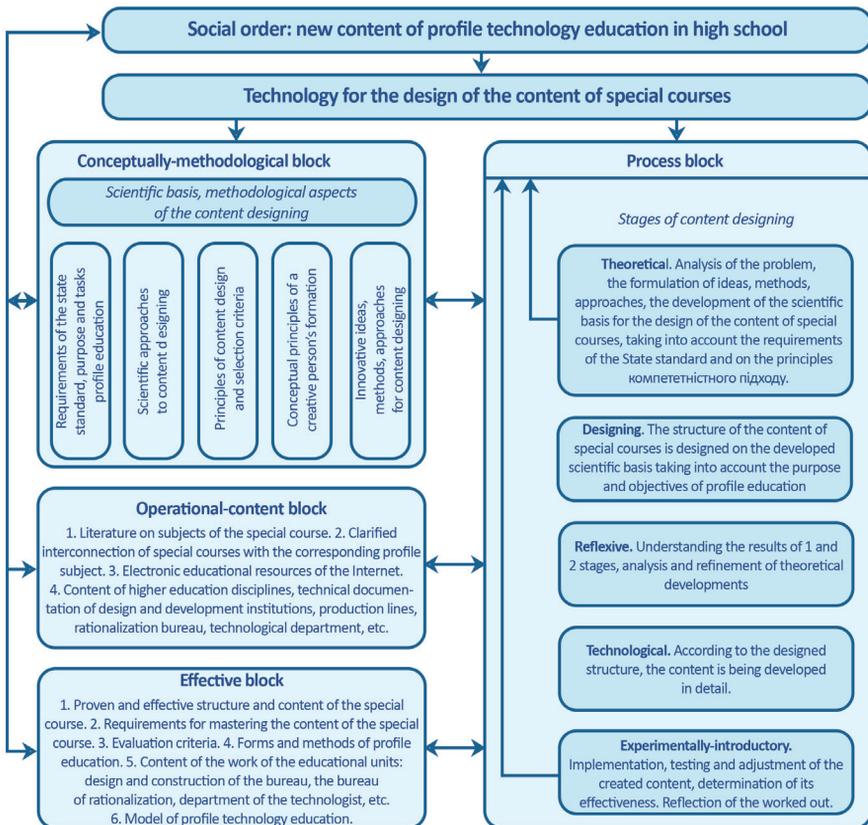


Fig. 1. Structural and functional model of technology of designing the content of special courses in the educational industry “Technologies”.

At the same time, special courses in the broad aspect of problem theoretical issues, the development of their content are practically not investigated. Therefore, an important aspect of the problem of creating special courses on technology engineering is to solve a wide range of issues: ensuring the necessary interconnection and complementarity of the content of the special course and corresponding profile subject, determining the pedagogical conditions and methodical features of the implementation of their content in the educational process of the lyceum in the complex; definition of pedagogical conditions for the use of special courses in the educational process, regardless of the profile object (that is, as an independent subject) and the design features of their content in this case; definition of methodical features of the implementation of the content of the special course as an independent subject on the basis of a competent approach, etc.

Taking into account the above, a new innovative approach is created for creating the content of a special course in technology engineering. Its essence is that the designed content of the manual should provide the possibility of multipurpose use of the special course in the educational process of the lyceum. Namely: the special course should be successfully used in conjunction with the profile subject in the lyceums, who chose the technological profile, and as a separate subject in lyceums, which do not have a technological profile. The said is an important pedagogical condition for designing the content of the special course "Designing and Constructing of Engineering Objects" as well as for the effective implementation of its content in the educational process.

Let's consider the essence and methodical features of designing the content of the special course "Designing and Constructing of Engineering Objects" in accordance with the first appointment. In the curriculum of the profile subject "Technical Design", which is posted on the website of the Ministry of Education and Science of Ukraine, very important issues of designing technical objects (products) by specialists and students are revealed: "Technical task for the design of a technical object (product)", "Understanding of technical task", "Design concept", "A sketch test of constructive design. Draft project", "Technical and operational design"; the complex of issues that contribute to the formation of a student's creative personality is considered. However, only a special subject «Technical Design» cannot cover and disclose all issues relating to the process of creating the product from the idea to its implementation in the finished product, to ensure the development of design abilities of students, the formation of design and technological competence at a high level. Therefore, the teacher should use the appropriate special course, which is an important component of the varied component of the content of the technological profile of senior pupil training. The content of such a special course should correspond to the subject content of the profile object and, accordingly, expand, complement, refine the educational material of the profile item.

Taking into account the above, in the manual of the special course «Designing and Constructing of Engineering Objects», the range of questions concerning the process of designing technical objects (products), development of designing abilities of pupils was

expanded. Important importance is given to the comprehensive consideration of issues relating to technical contradictions, their essence and significance in the process of designing and constructing engineering objects. Pupils need to be well aware that a newly developed technical object is the result of a solution to technical contradictions that the technical contradiction is the driving force behind the creation of new technical objects, which in most cases are inventions. In many cases, various types of innovative offers have been introduced into the product. The indicated educational information in pupils is formed knowledge of such types of technical creativity of specialists as rationalization and invention. In connection with the above graduates of the Lyceum, as future designers and inventors, should be well aware of the importance of the process of patenting, to understand that such a patent, where such information can be read. The content of the manual for the special course is detailed in the following educational information.

In addition, the manual "Designing and Constructing of Engineering Objects" devotes considerable attention to considering a wide range of important issues of designing objects by specialists and pupils, methods and means of teaching pupils design, development of their design abilities, etc. Thus, the contents of the manual for the special course significantly expands, deepens, specifies, etc. content of the profile subject "Technical design". The above-mentioned is *an important pedagogical condition and methodical features of effective implementation of the content of the special course "Designing and Constructing of Engineering Objects" in the educational process in conjunction with the profile subject.*

The use of the profile of the subject and the special course in the complex will promote the effective mastery of the pupils the basics of design and development activities. In this regard, the teacher must correctly orientate: what training information and in what case take from the programs of the profile and special course and how to combine them in order to expand and deepen pupils' knowledge of the design and construction of products, the formation of creative personality and design and technological pupils' competence; what forms and methods to use for the implementation of the content of the profile and special course; as it is expedient to visualize the professional activity of specialists, disclosed in the content of these components of the variable component of the technological profile of training senior pupils, etc. *These are important methodological features of the implementation of the contents of the manual of the special course in the educational process of the professional lyceum on the basis of a competent approach.*

The second direction of the use of special courses — in lyceums, which have not chosen a technological profile. There, the special course is used in the educational process, regardless of the profile subject, that is, as an independent study subject (course of choice). In this case, the content of special courses in technology should be designed so that it could independently provide the design and technological competence of pupils, creative technical potential, conscious choice of their future professional activities engineering and technical direction.

Special course "Designing and Constructing of Engineering Objects" has already been selected by some schools and implemented in the educational process as an independent subject. *The results of the experimental testing* of the content of the special course indicate that it provides the fulfillment of the above tasks. Therefore, it was important in this context to clarify the factors, *pedagogical conditions and methodical features that contributed to the successful implementation of the content* of the special course in the educational process as an independent subject. Analysis of the contents of the manual, taking into account the results of the experiment, the educational process using its content, has made the following conclusions.

1. As noted at the beginning of the article, in order to obtain the modern effective content of engineering and technical direction, the scientific and theoretical basis for designing the contents of the manual for the special course "Designing and Constructing of Engineering Objects" (ideas, methods, approaches, model, etc.) has been developed.

2. The basis of profile training technologies in the professional lyceum in the content of the special course "Designing and Constructing of Engineering Objects" (as an independent subject) became a holistic project and close to the productive educational activities of pupils according to the structure of modern scientific high-tech production: technical design and construction, design technological processes, technical equipment of production (in the school — educational workshops), manufacturing technology, presentation of the manufactured product. Therefore, in the course of mastering the content of the special course pupils' activity is provided on the basis of the activity of the production design bureau, the technologist's department, the experimental model shop, the presentation hall. This contributed to the creation of (in the right amount) of the educational environment close to the production, in which they took place in the form of a business role-playing game. The essence of such creative activity was that each pupil chose a creative role for himself in the game: a designer, a constructor, a technologist, a game leader. At will pupils changed their roles. As the results of the experiment showed, for professional training of pupils in the content of the special course "Designing and Constructing of Engineering Objects", the presence in the business game of roles, imitating creative technical activity of specialists of professional level is very important.

The methodological approach described above to the organization of the educational process for pupils' mastering of the basics of design and development corresponds to the innovative, organizational form and is *an important pedagogical condition and, at the same time, methodical features of the effective implementation of the content of the special course* of engineering and technical direction on the basis of a competent approach.

3. During the implementation of the content of the special course "Designing and Constructing of Engineering Objects" in the lyceum, the following is used:

- innovative forms of organization of the educational process: creative cooperation of students in small groups, business role-playing game "Design Bureau".

- interactive methods of profile education of students to the basics of designing and constructing engineering objects: "brain attack", "shadow brain attack", "synectics", "use of analogies", etc.

As the results of the experiment showed, the use of innovative forms of organization of the educational process and interactive teaching methods contributed to the effective implementation of the content of the special course, which is also *a pedagogical condition and methodical peculiarities of its implementation*.

4. In the special course "Designing and Constructing of Engineering Objects" a connection was made with related special courses of the technological profile and the basics of knowledge of other sciences (physics, biology, economics, general technical disciplines of higher educational institutions, etc.). Such a scientific approach to designing the content of the special course of engineering and technical direction provided *the basis for innovative and inventive activity of pupils of the lyceum, which should also be attributed to the pedagogical conditions for the effective implementation of the content of the special course*.

II Methodical Toolkit: Features and Tasks.

Methodical tool of the manual "Designing and Constructing of Engineering Objects" is multifaceted and wide-ranging. It provides a thorough, mastery of the manual's contents, effective use of the knowledge and, accordingly, the fulfillment of the tasks of profile education in its content, the formation of the subject design and technological competence and key pupils' competencies. Methodical apparatus includes: the question of updating the basic knowledge of pupils, practical work, creative tasks for the fixing of the educational material of the theme, control questions, recommended literature on the topic, the key concepts, "World of Professions", "Prominent Scientists in the field of science and technology", "Dictionary of New Terms". One of the components of the mechanism for controlling the quality of pupils' knowledge in the manual is the system of test tasks from the entire course "Designing and Constructing of Engineering Objects".

The multifaceted and wide-ranging methodical manual of the manual is *a very important pedagogical condition for a thorough mastery of the students by its content*, and hence the effective implementation of content in the educational process. Let's consider its components in detail.

Before each new topic on pupils' mastering the basics of designing and constructing engineering objects at the profile level, pupils are asked to update the knowledge acquired at the previous lessons and classes in the primary school in the process of implementing creative technical projects on the design and products construction. The results of the experiment showed that the logical analysis by the pupils of these questions, the formation of substantiated responses on the content of the special course, systematization and generalization of knowledge at the level of the basic school (in particular, obtained in the course of implementation of creative projects on designing and constructing products) contribute to qualitative assimilation by the pupils of the new educational material at the

profile level, its practical application and, as a consequence, the formation of design and technological competence of pupils. The foregoing ensures the implementation of the basic principles of didactics (continuity, consistency, perspective) in the process of pupils' mastering of the basics of design and development at the profile level.

After pupils' assimilating with theoretical issues that are important for the design and construction process of products, the manual provides for practical work. In the process of their implementation, pupils' skills and abilities are used to apply the methods, techniques, techniques, rules, principles, etc. that are learned in practice, which contributes to the development of design and technological competence in pupils. These skills are separate elements that form part of the overall design competencies regarding the practical implementation of learning design and construction operations.

In order to form pupils' skills and abilities of independent search of knowledge, self-control on the level of educational achievements in the structure of the manual provides for the pupils to perform creative tasks on the subject of the educational material of each topic. It should be noted that the pupils' fulfillment of creative tasks includes one more goal — purposeful pupils' preparation for the design of selected technical objects in the process of implementing creative technical projects. This is especially true of the logical chain of topics devoted to the consideration of the stages of production and professional design of a new technical object: "Understanding the technical task", "Design concept", "Scheduled verification of constructing design. Draft project", "Technical and operational design", "Experimental and research sample".

In order to update the training activities, focusing the students' attention on the key concepts and key issues that students must learn, the manual provides a section called "Key Concepts."

The heading "Dictionary of New Terms" provides definition of new terms that are used in the content of the training material. Knowledge of their essence will facilitate understanding and comprehension of the learned teaching material of the manual.

The "World of Professions" and "Prominent Scientists and Designers in the Field of Science and Technology" are intended to familiarize pupils with the world of occupations associated with the design and construction of engineering objects; prominent scientists and designers; information about their tasks and responsibilities, qualification requirements, etc.

The final structural component of each topic is the "Control Questions" heading.

The manual also contains the "Test Tasks" for self-checking the knowledge acquired by pupils from practically all of the tutorials. They are varied and differentiated in terms of complexity, reproductive and creative content. Depending on the goal set by the teacher, such tasks allow to carry out operational control, self-control and intercontrol of the level of pupils' educational achievements at all stages of training. Each test questions has five answers. Among them there are those that give an approximate, incomplete or incorrect answer, and only one of them gives the most complete answer to the question posed.

The set of questions: questions on actualization of pupils' basic knowledge, creative tasks to consolidate the educational material of the subject, control questions, test tasks, creative tasks for checking and self-checking the knowledge and skills acquired by pupils, criteria for knowledge evaluating, skills, formed competencies, defined by the authors of the article as a control mechanism of knowledge quality of the lyceum pupils.

Conclusions. In the conditions of development of high-tech and high-tech societies, the introduction of a new model of profile technological education, which would be based on the trends of technological education of economically developed countries, becomes of great importance in the educational process.

The basis of the content of the pupils' technological profile in lyceum, in addition to profile subjects, there is another important component — special courses. Special courses reflect the specifics of a concrete training profile and, together with the profile, determine its essence. They provide in-depth and expanded study of the content of individual sections of profile subjects, may include additional related sections, orienting pupils to a set of possible occupations in the direction of the chosen teaching profile, etc.

Therefore, in the article the peculiarities of designing the content of the special course for the profile training of technology engineering and technical direction were revealed. A number of innovative ideas, methods and approaches were formulated, a structural and functional model was developed, which formed the scientific and theoretical basis for designing the textbook content of the special course of engineering and technical direction "Designing and Constructing of Engineering Objects".

The pedagogical conditions and methodical peculiarities of the special course content in the educational process of the professional lyceum on the basis of the competence approach were determined.

The peculiarities of the use of the special course in the complex with the profile subject and as a separate course of choice were revealed.

The importance of the multifaceted and wide-ranging methodical apparatus of the manual for the special course for the thorough mastery of students with the content of the special course, the formation of the subject design and technological competence of the pupils and key competencies was substantiated.

The results of experimental testing are presented in order to find out the effectiveness of the manual's content of a special course for profile technology training of engineering and technical orientation.

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ДИДАКТИЧНІ ФУНКЦІЇ НАВЧАЛЬНОГО ПОСІБНИКА ДЛЯ СПЕЦКУРСУ З ПРОФІЛЬНОГО НАВЧАННЯ ТЕХНОЛОГІЙ ІНЖЕНЕРНО-ТЕХНІЧНОГО СПРЯМУВАННЯ

У статті розкрито особливості проектування змісту спецкурсу для профільного навчання технологій. Сформульовано низку інноваційних ідей, способів і підходів, розроблено структурно-функціональну модель, що склало науково-теоретичну основу проектування змісту навчального посібника спецкурсу інженерно-технічного спрямування «Проектування і конструювання об'єктів техніки». Обґрунтовано важливість змісту спецкурсу для формування в учнів проектно-технологічної компетентності, творчого технічного потенціалу, забезпечення свідомого вибору учнями своєї майбутньої професійної діяльності інженерно-технічного спрямування.

Визначено педагогічні умови й методичні особливості реалізації змісту спецкурсу в навчальному процесі ліцею (старшій школі) на засадах компетентнісного підходу.

Розкрито особливості використання спецкурсу в навчальному процесі в комплексі з профільним предметом і як окремо взятого курсу за вибором.

Обґрунтовано важливість багатогранного й широкопланового методичного апарату посібника спецкурсу для ґрунтовного оволодіння учнями змістом спецкурсу «Проектування і конструювання об'єктів техніки», ефективного виконання завдань профільного навчання за його змістом.

Визначено механізм контролю якості знань учнів з основ проектно-конструкторської діяльності.

Наведено результати експериментального апробування з метою виявлення ефективності змісту посібника спецкурсу для профільного навчання технологій інженерно-технічного спрямування.

Ключові слова: профільне навчання технологій, спецкурси, проектно-технологічна компетентність, проектування змісту, наукова основа, свідомий вибір професії, педагогічні умови, методичні особливості, методичний апарат.

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ДИДАКТИЧЕСКИЕ ФУНКЦИИ УЧЕБНОГО ПОСОБИЯ ДЛЯ СПЕЦКУРСА ПО ПРОФИЛЬНОМУ ОБУЧЕНИЮ ТЕХНОЛОГИЙ ИНЖЕНЕРНО- ТЕХНИЧЕСКОГО НАПРАВЛЕНИЯ

В статье раскрыты особенности проектирования содержания спецкурса для профильного обучения технологий. Сформулирован ряд инновационных идей, способов и подходов, разработана структурно-функциональная модель, что составило научно-теоретическую основу проектирования содержания учебного пособия спецкурса инженерно-технического направления «Проектирование и конструирование объектов техники». Обоснована важность содержания спецкурса для формирования у учащихся проектно-технологической компетентности, творческого технического потенциала, обеспечения сознательного выбора учащимися своей будущей профессиональной деятельности инженерно-технического направления.

Определены педагогические условия и методические особенности реализации содержания спецкурса в учебном процессе профессионального лица на основе компетентностного подхода.

Раскрыты особенности использования спецкурса в комплексе с профильным предметом и в качестве самостоятельного учебного предмета в учебном процессе профессионального лица.

Обоснована важность многогранного и широкопланового методического аппарата пособия спецкурса для эффективного овладения учащимися содержанием спецкурса «Проектирование и конструирование объектов техники», эффективного выполнения задач профильного обучения по его содержанию. Отмечена важность методического аппарата пособия для выполнения основных принципов дидактики в процессе профильного обучения технологий.

Определен механизм контроля качества знаний учащихся.

Ключевые слова: профильное обучение технологий, спецкурсы, проектно-технологическая компетентность, проектирование содержания, научная основа, сознательный выбор профессии, педагогические условия, методические особенности, методический аппарат.