

5. Shynkaruk, L.V. (2016) Konstruiuvannia klasteru osobystisnykh yakostei biznes lidera: zarubizhnyi i natsionalnyi dosvid [Designing a cluster of personal qualities of a business leader: foreign and national experience] NUBiP Ukrainy. Seriiia «Pedahohika. Psykholohiia. Filosofiiia». K.: Milenium, 239. S. 286-292.

6. Yatskiv, L.F. Informatsiino-osvitnie seredovyshche yak osnova efektyvnoho resursno-oriientovanoho navchannia studentiv [Information and educational environment as the basis of effective resource-oriented student learning] Available at :: <http://acup.poltava.ua/wp-content/uploads/2015/02/2.pdf>.

## ИНФОРМАЦИОННО-КОММУНИКАЦИОННЫЕ ТЕХНОЛОГИИ В УПРАВЛЕНЧЕСКОЙ ДЕЯТЕЛЬНОСТИ РУКОВОДИТЕЛЯ ПРОФЕССИОНАЛЬНО-ТЕХНИЧЕСКОГО УЧЕБНОГО ЗАВЕДЕНИЯ

Л.Л. Билан, Н. С. Клименко

**Аннотация.** В статье освещены актуальные вопросы эффективного внедрения новейших информационных технологий в управление профессионально-техническим учебным заведением для создания единой информационной среды. Обосновано, что применение в управлении учебным заведением информационных компьютерных технологий позволит повысить эффективность учебного процесс, уменьшить время на выполнение текущей работы, предоставит возможность оперативного доступа к информации о деятельности учебного заведения.

**Ключевые слова:** информационно-коммуникационные технологии, управленческая деятельность, профессионально-техническое учебное заведение.

## INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE MANAGERIAL ACTIVITY OF THE LEADER OF PROFESSIONAL AND TECHNICAL EDUCATIONAL AGENCY

L. L. Bilan, N. S. Klymenko

**Abstract.** The article highlights current issues of effective implementation of the latest information technologies in the management of a vocational and technical educational institution for the creation of a unified information environment. It is substantiated that the use of information computer technologies in the management of an educational institution will allow increasing the efficiency of the educational process, reducing the time for performing current work, and providing an opportunity for prompt access to information on the activities of the educational institution. For a qualitative process of managing an educational institution it is necessary to continuously improve the material and technical provision of the educational institution; update software for management tasks; to implement an electronic library.

**Key words:** information-communication technologies, management activity, vocational-technical educational institution.

УДК 378: [37.011.3-051:62/64]

## THE ANALYSIS OF THE PROJECT-TECHNOLOGY ACTIVITY OF FUTURE TEACHERS OF LABOR STUDIES FROM THE COURSE OF «METHODS OF TEACHING DRAWING»

L.V. BOZHKO, an assistant of the department of technical disciplines and training

**SHEE «Kryvyi Rih State Pedagogical University», (Ukraine, Kryvyi Rih),**

E-mail: [ludmilaborhko@gmail.com](mailto:ludmilaborhko@gmail.com)

**Abstract.** In the article the features of the design and technology activity of the future teachers of labor studies and the semantic description of the concepts of «technical ability», «technical thinking» and «project - technology thinking» is scientifically argued, the methodology of stimulating of the design and technical thinking in future teachers at studying of graphic disciplines is given. The requirements to the graphic and technological preparation of future teachers of labor training in the context of competency approach, their professionally significant qualities are formulated based on a thorough analysis of contemporary transformations in education; the features of the

*methods of teaching drawing in promoting project and technical thinking of the future teachers of labor studies are revealed.*

**Keywords:** *design and technological activities, technical skills, technical thinking, methods of teaching drawing, graphic preparation of future teachers of technology, design and manufacturing tasks.*

**Актуальність (Introduction).** Modern production requires competitive professionals who are fluent in computer technology, have broad technical outlook, are able to acquire new techniques and the latest technological processes by themselves, quickly respond to immediate changes in the state of the technical means of labor, which are led by them, or change of the course of the process, to be able to predict possible effects of these changes, act atypically in extreme conditions. Therefore, the project design thinking is an important component of professional human activities, especially in the modern world. Today it is impossible to train specialists without the need to accumulating new knowledge and skills and improve their own skill level constantly.

The best conditions for the development of design and technical thinking of the future teachers of labor studies is created in the graphic and methodical preparation directly. Psychopedagogical studies indicate that the ability of man to graphic activity is one of the indicators of the level of technical thinking.

**Аналіз останніх досліджень та публікацій (Analysis of recent researches and publications).** Recently in psychological science and practice, much attention is paid to the technical abilities that some scientists attribute to art, namely A. Brehunets, B. Teplov, L. Himchuk etc. Questions of technical skills involved V. Alekseev, Yu Hilbuh, M. Davletshyn, M. Levitov, P. Jacobson from the position of psycho-pedagogical study of patterns of technical capabilities; S. Vasyleysky, E. Mileryan, V. Molyako, A. Nechayev, B. Nikitin, B. Rebus studied the capacity to certain types of technical direction, design, invention and generally labor technical skills; O. Botvinnikov, H. Cyrus, T. Kudryavtsev, B. Lomov, N. Menchinskay, I. Yakymanska studied the psychological processes that contribute to the success of the various components of the technical abilities etc.

**Мета (Purpose).** The purpose of the article is to reveal the meaning of the «technical ability» and «project technology thinking» of the future teachers of labor studies; justify the incentive features of the project technology thinking of students during the study of methods of teaching drawing.

**Методи (Methods).** In the process of research, the following methods were used: analysis, synthesis, generalization, systematization.

**Результати (Results).** Mr. Jacobson is known to approach for the first time for studying the actual technical capabilities. Based on the analysis of the technical activity, he proposed to include major components that characterize the technical capabilities: firstly, the technical features of thinking (rational approach to practical problems, taking into account the requirements of reality in its solving, adding elements of novelty in the solution, good operations planning); secondly, it is well developed spatial imagination; thirdly, the ability to combine; fourthly, manual (i.e. hand) dexterity.

P. Jacobson considered general personality traits are a distinct interest in technology, persistence in the search, without these qualities technical ability, in his opinion, wouldn't get the desired manifestation. Under the technical abilities P. Jacobson understood not the highest level of the achievement in art, but only «possibility to work successfully in the field of technology in the performance of tasks that can reasonably be supplied to students of a certain age range based on their knowledge, skills and technical expertise» [5, p. 214].

The studies of M. Levitov made an important contribution to the study of technical skills. His position was that the technical ability is a complex mix of qualities. M. Levitov [3, p. 58] distinguished between the technical capabilities two types of activities: the executive, in which «it is necessary according a clearly defined instructions to perform the same operation or several related transactions» and the creative - «the works of design, innovative and inventive, characterized by the fact that they investigated new ways of technical equipment». But, according to the author's study, you should not seek to «absolute difference» between both types of activity, as technical skills are the basis of both, although finding expression at different levels. The psychological components of executive technical activities, though belonging to the technical skills, but their requirements are lower than the creative technical work.

A variety of technical activities for its difficulty (level) and content shows the diversity of preparation, mastering of necessary knowledge, skills and abilities. But we can talk about some common psychological component of technology activities like general intelligence.

Analyzing psychology to engineering abilities, M. Levitov identified technical understanding and technical skill. In the technical sense he meant a correct and relatively rapid recognition of the structure and function of technical devices.

A person who is capable of engineering recognizes the technical object in another way than less capable. He/she perceives spatial relationships better: distance, size and shape of objects. In this perception a good eye plays an important role. The technical understanding requires memory (spatial memory size, distance, shape objects).

The development of technical abilities S. Vasyleyskyy, like several other researchers, considered a prerequisite for technological inventions. «Technical skills are defined and formed as a result of a fundamental orientation of a person on the technique, the production, the means of production ...» [1, p. 59]. In his view, the technical features of the observation and experience, technical thinking and imagination, ability, turning into «technical talent, are at the same time important prerequisites for the development of technological innovation».

Having analyzed a large number of innovative proposals, based on the practice, S. Vasyleyskyy [1] identified some degrees of innovation: at the level of trial and error; at the level of scheme (self-regulating level); at the level of deep fundamental scientific and technical justification.

Expect the line of innovation - from the practice to the theory – S. Vasyleyskyy pointed the other way – from the theory to the practice, from the theoretical to the practical technical thinking, from the science and engineering to the technical innovation.

Exploring the fundamental theoretical and practical aspects of the formation of the technical capabilities M. Davlyetshyn proposed the definition of the peculiar combinations of individual psychological personality traits that determine suitability for human technology activity that is the ability to understand technology, operate it, and the ability to produce technical products, capacity for technological invention and design. He identified technical thinking, spatial imagination, observation, manual dexterity in the structure of technical skills.

B. Rebus defined the creative technical activities as activities related to the design and creation of the various mechanisms, machines, devices and other technical facilities of the relevant elements of novelty. This activity is associated with a broad technical outlook and provides intensive activity of imagination and thinking. Trying to define the basic psychological components of technical creativity, B. Rebus divides it into discovery, invention and rationalization. According to the researcher, for inventive activity sufficient technical understanding, based on ownership is technical and skills as well as technical skill. The observation has an important role for the technical work. In this respect it is assumed that «the formation and development of technical observation depends not only on experience and knowledge of man, but from individual psychological characteristics of personality» [4, p. 92].

According to E. Govorova [2] technical abilities occupy a leading position in shaping the personality of future teacher of technology. This is due, so that they are related to the needs of technical production, its equipment and technology, scientific and technological revolution.

Thus, from the above analysis of processed sources we concluded that the *abilities* are the complex properties of the individual and to control their development we must know the basic components in their relationship form the structure of abilities. Under *the technical skills* we understand subspecies of special abilities – they are the individual psychological characteristics of personality that determine its suitability for technical activities of labor studies and technological education and the success of its implementation.

We can suggest that the formation and development of technical skills, along with the transfer of knowledge, is one of the main objectives of technological education based on the research of scientists forming abilities of future teachers of technology. The technical thinking is closely related to the process of the comprehensive and constantly interacts with it. The sophistication of thinking and skills determines the success in mastering the knowledge largely, empowers mastering a given content of knowledge. In turn, the nature and direction of the development of skills in the educational process, of course, determined by the content of learning

The project activity is one of the most promising components of the educational process, so that creates the conditions of the creative self-development and self-realization of students, creates the necessary life competencies. Self acquiring of the knowledge, their ordering, the opportunity to navigate at the information space, to see the problem and solve it, occurs because of the method of the project.

By A. Kobernik we understand the project thinking of students as a special form of human mental activity that combines different types of mental operations, aimed at the formation of the project plan, the developing of optimal solutions, the designing of creative tasks, the choice of materials and resources of mapping and visualization, creative planning process of design activity with specific project situations.

The promoting of the project thinking of future teachers is seen as a process of formation of positive dynamic change of the project thinking of the students influenced by the education, the training, the creation of a specific socio-cultural environment.

In the development of technical skills of the students as incentive of the project thinking are: techniques (imagination, analysis, synthesis, explaining, planning, problem, discussion, reflection and other methods.); learning tools (problematic task, slides, videos, design objects, portfolio, creative situations, projects, etc.); forms (debates, protection projects, workshops, competitions, exhibitions, conferences, etc.).

In general, the importance of the incentive of the project thinking in the development of technical skills of students appears that they are on target the student to curiosity and interest of this activity, allow differentiating and individualizing the student's cognitive activity, contribute to the development of self-learning activities.

The main way to stimulate the project and technical thinking of future teachers is the creation of problematic situations and formulating of creative tasks of design type.

As the basis of the creative process in art and technology activity scientists E. Klimov, T. Kudryavtsev, V. Madzihon, V. Molyako, A. Tarara use a three-stage scheme, which includes the following highlights: setting a creative task; solving the problem in graphic terms; emerging manufacturing facility artistic and technical creativity.

While studying, we found out what factors contribute to students' self staging of creative tasks. It turned out that the main problem in the above is the presence of certain motifs students of work. These are interests, daily necessities of life, sense of duty to the collective pupils, teachers, parents and others.

An important condition for the realization of the first phase of the creative process is *the artistic and technical observation*: the ability of students to analyze specific artistic and technical events, refer to them critically, notice flaws in the objects and processes of artistic and technical creativity.

The implementation of the second phase of the heaviest creative process based on a complex *analytic-synthetic activity* of the future teachers of technology. This phase involves the search of the leading idea of creative design, the developing of the principle of the invention, the concretization of the method of the solving the problem and its implementing in graphic term. In other words, the second stage of the creative process involves the creation of an ideal model of artistic and technical facility and its embodiment in the form of a graphic image. Terms of the successful implementation of this stage is highly creative imagination, technical thinking, and the ability to transform the mental image of the object that is created, and the relevant knowledge and skills.

The third stage of the creative process involves *the manufacture of the product for a given graphical image*. This stage is not without the elements of the creativity. The transition from the «theoretical» model of the product to the «practice» often brings new challenges and requires some research and intellectual tension. However, most of the work, when the task is usually simple, and the third stage is based on the graphic and labor and skills and does not require much creative effort that is carried by the reproductive activity.

The tasks that require creative processing, comparison, generalization, systematization play an important role in stimulating of students' interest to study methods of teaching drawing; which provide for the conduct of the experiment; contain the problem; provide for scientific and practical research. Home creative work can be different: posing questions for reflection, preparation of presentations in class, creating presentations, making the original products that requires

knowledge of drawing, crossword and the like.

The incentive of the project-technical thinking of students in the study of methods of teaching drawing is by updating the appropriate use of the following teaching techniques:

1. «Intellectual warm-up» – a dialogue between students in the form of questions and answers focusing on the material topics that is studied. The technique helps to identify the depth of the knowledge and, most importantly, the knowledge gaps of students; involves a fast paced verbal activity. For example: «What is the technical drawing?»; «What distinguishes the technical drawing from photographs, sketch or drawings?»; «How to make measures? «

2. «Believe it or not» – the technique by which you can trace the level of assimilation of the knowledge by sketching and interpreting them. Each question begins with the words: «Do you believe that...». Students must agree with this statement or disprove it. For example: «The method of the central projection is used in the visual arts», «A flat object is projected onto three planes».

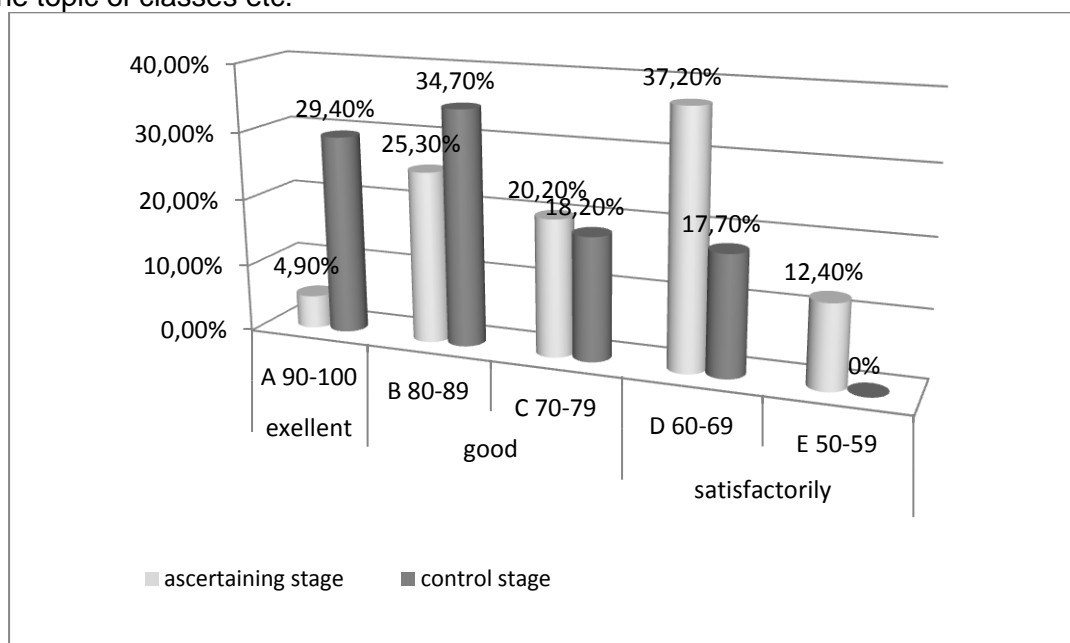
3. «A quick poll of the chain» – the first student asks another, and so forth, it is desirable to hold competitions on the correctness and speed of answering with the obligatory wrap-up and to mark the author of the most interesting questions and full answers.

4. «A graphic dictation», a vocabulary dictation - teacher dictates the concepts, terminology, students transcribe them with further check of works in groups with prepared cards with right answers.

5. The interview differs from ordinary conversation with provocative questions, and requires students to put themselves in the place of an outstanding personality in the graphics activity, or a famous designer and innovator.

6. «The question for the neighbor» – the students are divided into pairs, so each partner should make for the neighbor a question of the studied material. For example, «What are the disadvantages of graphics you know?» «What kind of software is advisable to produce drawings of architectural structures? What techniques of engineering graphics is advisable to use it?» and so on.

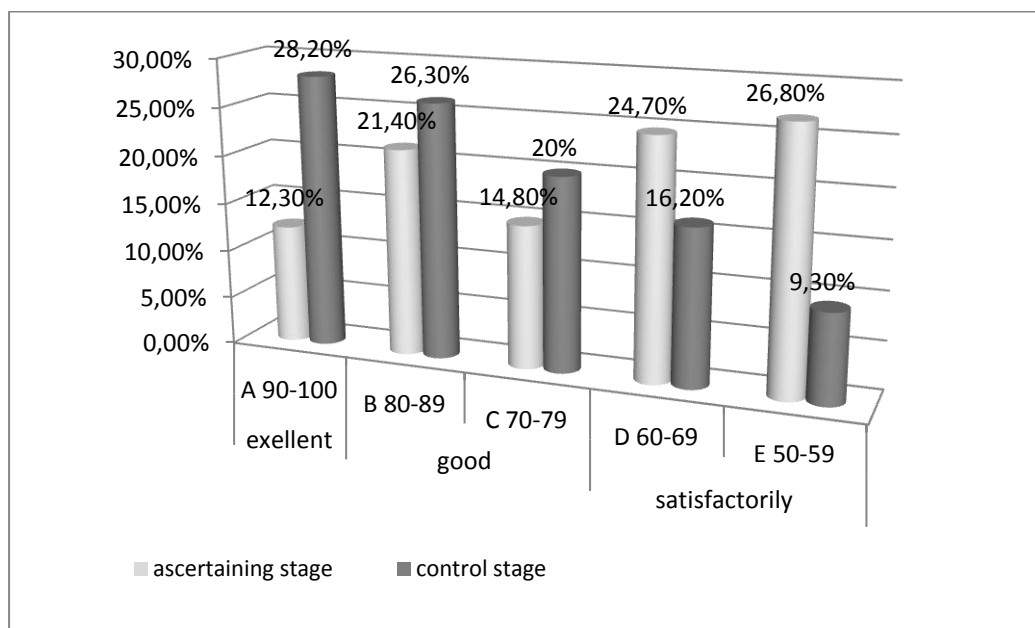
7. «Observation session», students usually like to observe and notice interesting things, unnoticeable at first glance. Invite them to participate in the session of the observation. Show a presentation, a number of illustrations, photographs, etc. and focus on the task: to find out what unites this material; to find extra photos and to explain their choice; to determine how the material related to the topic of classes etc.



**Fig. 1. The results of the progress of the discipline «Descriptive geometry and drawing»**

The forms of intermediate and final control of the knowledge assessment from the professional disciplines were students' responses on tests and examinations in the following disciplines as «Descriptive geometry and drawing», «Methods of teaching drawing». The results of diagnos-

tics of level of development of the project and technical thinking have found a qualitative improvement of the academic performance of students when using the techniques of updating (Fig. 1-2).



**Fig. 2. The results of the progress of the discipline «Methods of teaching drawing»**

**Висновки і перспективи (Discussion).** This proves a significant fact that characterizes the positive changes that have occurred in the cognitive sphere of the development of the project and technical thinking of students, and display of the signs of readiness of future teachers of labor studies to the teaching of drawing at school. This increase in students' personal direction for creative expression and self-determination in the conditions of educational-cognitive activity on studying of graphic disciplines aimed at the development of technical abilities proving a heightened interest and personal participation of the future teachers of labor studies in the academic and extra-curricular forms of its organization.

Thus, the analysis of the problem shows that the real creative work begins with an independent search task and complete the final incarnation of the developed ideas in a newly created product.

#### Список використаних джерел

1. Василейский С.М. Технические способности и условия их развития как предпосылка технического новаторства / С.М. Василейский // Проблемы способностей. – М. : Издво АПН РСФСР, 1962. – С. 122–126.
2. Говоров Є.М. Технічне мислення як складова професійної культури майбутнього вчителя технологій / Є. М. Говоров // Вісник Чернігівського національного педагогічного університету ім. Т.Г. Шевченка. – 2015. – Вип. 130. – С. 193–196.
3. Левитов Н.Д. Детская и педагогическая психология / Н.Д. Левитов. – М. : Просвещение, 1964. – 478 с.
4. Ребус Б.М. Психологические основы делового общения / Б.М. Ребус. – М. : Илекса, 2001. – 176 с.
5. Якобсон П.М. Эмоциональная жизнь школьников / П.М. Якобсон. – М. : Просвещение, 1966. – 291 с.

#### References

1. Vasileysky S.M. (1962) Technical abilities and conditions for their development as a premise of technical innovation. *Problems of abilities*. M.: publishing of the Academy of Pedagogical Sciences of the RSFSR. 122-126.
2. Govorov Y.M. (2015) Technical thinking as a component of the professional culture of the future teacher of technology. *Visnyk of Chernihiv National Pedagogical University named after T.G. Shevchenko*. V. 130. 193-196.
3. Levitov N.D. (1964) Pedagogical and Pedagogical Psychology. M.: Enlightenment. 478.

4. Rebus B.M. (2001) Psychological bases of business communication. M.: Ilexa. 176.
5. Jacobson P.M. (1966) Emotional life of schoolchildren. M.: Enlightenment. 291.

#### **АНАЛІЗ ПРОЕКТНО-ТЕХНІЧНОЇ ДІЯЛЬНОСТІ МАЙБУТНІХ ВЧИТЕЛІВ ТРУДОВОГО НАВЧАННЯ З КУРСУ «МЕТОДИ НАВЧАННЯ КРЕСЛЕННЯ»**

**Л.В. Божко**

**Анотація.** Науково обґрунтовані особливості проектно-технологічної діяльності трудових досліджень майбутніх учителів та семантично описані поняття «технічні здібності», «технічне мислення» та «проектно-технологічне мислення», методика стимулювання дизайну та технічного мислення майбутніх учителів при вивченні графічних дисциплін. Вимоги до графічної та технологічної підготовки майбутніх учителів трудового навчання в контексті підходу до компетентності, їх професійно значущих якостей формулюються на основі ретельного аналізу сучасних перетворень у сфері освіти; виявлено особливості методів навчання малюнка в ході проекту та технічне мислення майбутніх учителів трудових досліджень.

**Ключові слова:** проектно-технологічна діяльність, технічні навички, технічне мислення, методи навчання малюнків, графічна підготовка майбутніх вчителів технології, проектні та виробничі завдання.

#### **АНАЛИЗ ПРОЕКТНО-ТЕХНОЛОГИЧЕСКОЙ ДЕЯТЕЛЬНОСТИ БУДУЩИХ УЧИТЕЛЕЙ ТРУДОВЫХ ИССЛЕДОВАНИЙ ИЗ КУРСА «МЕТОДЫ ОБУЧЕНИЯ ЧЕРТЕЖА»**

**Л.В. Божко**

**Аннотация.** Научно обоснованные особенности проектно-технологической деятельности трудовых исследований будущих учителей и семантически описаны понятия «технические возможности», «техническое мышление» и «проектно-технологическое мышление», методика стимулирования дизайна и технического мышления будущих учителей при изучении графических дисциплин. Требования к графической и технологической подготовке будущих учителей трудового обучения в контексте подхода к компетентности, их профессионально значимых качеств формулируются на основе тщательного анализа современных преобразований в сфере образования; выявлены особенности методов обучения рисунка в ходе проекта и техническое мышление будущих учителей при трудовых исследованиях.

**Ключевые слова:** проектно-технологическая деятельность, технические навыки, техническое мышление, методы обучения рисунков, графическая подготовка будущих учителей технологии, проектные и производственные задачи.

УДК 378.663-057.21:001.89

#### **СТАНОВЛЕННЯ ТА РОЗВИТОК ПІДГОТОВКИ ІНЖЕНЕРІВ АГРАРНОГО ПРОФІЛЮ ДО ДОСЛІДНИЦЬКОЇ ДІЯЛЬНОСТІ**

**І. М. БУЦИК**, кандидат педагогічних наук, доцент, докторант кафедри педагогіки

**Національний університет біоресурсів і природокористування України**

*E-mail:* [i\\_butsyk@ukr.net](mailto:i_butsyk@ukr.net)

**Анотація.** У статті схарактеризовано організацію навчального процесу щодо формування дослідницьких здатностей на етапах зародження інженерної підготовки та підготовки інженерів для сільського господарства, впровадження методик з елементами дослідництва, широкого залучення студентів до науково-дослідної роботи, уведення науково-дослідної роботи студентів як обов'язкового елемента навчального процесу, зниження дослідницької підготовки інженерів аграрного профілю, спрямованість сучасної освіти.

**Ключові слова:** дослідницькі здатності, система, методична система, методика навчання, інженер аграрного профілю.

**Актуальність (Introduction).** Професійна підготовка інженерів аграрного профілю до дослідницької діяльності має свої історичні корені. Навчальний процес з давніх часів зазнавав постійного розвитку і удосконалення. Ті чи інші суспільні чинники впливали на зміни у підходах в організації навчального процесу, що і спричиняло зміну видів навчання, змісту, ме-