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**ВИКОРИСТАННЯ ІНСТРУМЕНТІВ Е-НАВЧАННЯ ДЛЯ  
ЗАПОБІГАННЯ НЕГАТИВНИХ ЕМОЦІОНАЛЬНИХ СТАНІВ  
ЗДОБУВАЧІВ ВИЩОЇ ОСВІТИ**

**Анотація**

*Найновіші інформаційно-комунікаційні технології мають багато можливостей як для вдосконалення навчального процесу у сфері вищої освіти, так і для системи освіти загалом. Це той засіб, за допомогою якого на*

*практиці можуть бути реалізовані принципи інтенсифікації навчання, інтеграції психолого-педагогічної науки та практики, цілісності та безперервності навчального процесу. Завдання дослідження полягало у запобіганні негативних емоційних станів здобувачів вищої освіти з використанням інформаційно-комунікаційних технологій. Мета - вивчення педагогічних та психологічних особливостей засобів електронного навчання, які можуть запобігти формуванню емоційних розладів здобувачів. Показано, що інформаційні технології - це педагогічна технологія, що використовує спеціальні методи, програмне забезпечення та технічні засоби для роботи з інформацією. Запропоновано електронне навчання для досягнення педагогічних цілей: 1) розвиток особистості здобувача, підготовка до самостійної продуктивної діяльності в умовах інформаційного суспільства, 2) реалізація соціального замовлення, спричиненого інформатизацією сучасного суспільства, 3) активізація всіх рівнів навчального процесу. Використання інформаційно-комунікаційних технологій за допомогою мультимедійних лекцій, групових проєктів, колективна участь у наукових конференціях є одним із елементів педагогічної підтримки здобувачів вищої освіти, покращення їх психологічного стану, а також профілактичних засобів негативних емоційних станів.*

***Ключові слова:** електронне навчання, емоційні стани, масові відкриті онлайн-курси, здобувачі вищої освіти, інформаційні та комунікаційні технології.*

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## **ИСПОЛЬЗОВАНИЕ ИНСТРУМЕНТОВ Е-ОБУЧЕНИЯ ДЛЯ ПРЕДОТВРАЩЕНИЯ НЕГАТИВНЫХ ЭМОЦИОНАЛЬНЫХ СОСТОЯНИЙ СОИСКАТЕЛЕЙ ВЫСШЕГО ОБРАЗОВАНИЯ**

### **Аннотация**

*Новейшие информационно-коммуникационные технологии имеют много возможностей как для совершенствования учебного процесса в сфере высшего образования, так и для системы образования в целом. Это то средство, с помощью которого на практике могут быть реализованы принципы интенсификации обучения, интеграции психолого-педагогической науки и практики, целостности и непрерывности учебного процесса. Задача исследования состояла в предотвращении негативных эмоциональных состояний соискателей высшего образования с использованием информационно-коммуникационных технологий. Цель - изучение педагогических и психологических особенностей средств электронного обучения, которые могут предотвратить формирование эмоциональных расстройств соискателей. Показано, что информационные технологии - это педагогическая технология, использующая специальные методы, программное*

*обеспечение и технические средства для работы с информацией. Предложено электронное обучение для достижения педагогических целей: 1) развитие личности соискателя, подготовка к самостоятельной продуктивной деятельности в условиях информационного общества; 2) реализация социального заказа, вызванного информатизацией современного общества, 3) активизация всех уровней учебного процесса. Использование информационно-коммуникационных технологий с помощью мультимедийных лекций, групповых проектов, коллективное участие в научных конференциях является одним из элементов педагогической поддержки соискателей высшего образования, улучшение их психологического состояния, а также профилактических средств негативных эмоциональных состояний.*

***Ключевые слова:** электронное обучение, эмоциональные состояния, массовые открытые онлайн-курсы, соискатели высшего образования, информационные и коммуникационные технологии.*

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## USING E-LEARNING TOOLS TO PREVENT NEGATIVE EMOTIONAL STATES OF HIGHER EDUCATION APPLICANTS

### *Abstract*

*The newest information and communication technologies have many opportunities both for improving the educational process of higher education and for a system of education. This is the means by which the principles of intensification of learning, integration of psychological and pedagogical science and practice, the integrity and continuity of the educational process can be implemented in practice. The task is to prevent negative emotional states of higher education applicants using the information and communication technologies. The goal is to study pedagogic and psychological features of E-learning tools, which can help to inhibit the formation of emotional disorders of the applicants. It is shown that information technology is a pedagogical technology, which uses special methods, software and technical tools to work with information. It is proposed E-learning to achieve pedagogical goals: 1) development of applicant's personality, preparation for independent productive activity in the conditions of information society, 2) the implementation of the social order caused by the informatization of modern society, 3) the intensification of all levels of the educational process. The usage of information and communication technologies by means of multimedia lectures, group projects, collective participation at scientific conferences is one of the elements of pedagogic support of higher education applicants, the improvement of their psychological state as well as the preventive means of negative emotional states.*

**Keywords:** *E-learning, emotional states, Massive Open Online Courses, higher education applicants, information and communication technologies.*

**Formulation of the problem.** The changes, which have taken place in Ukraine at the beginning of the XXI century, are concerned not only political, legal, socio-economic spheres of human life, but also the field of education. The educational process plays a leading role in the solution of the tasks of professional

training of the specialists. Its goal is to acquire scientific knowledge, skills and versatile development by future professionals and to create comfortable conditions for mastering the knowledge.

The Law of Ukraine On Education emphasizes that the main principles of educational activities are human-centeredness, humanism, quality of education, providing equal access to education without any discrimination, scientific nature of education, unity of education, upbringing, and development. There is a growth of a person's role in the professional training of specialists. In developing the structure of curricula for the applicants, the attention is paid to effective combination of theoretical, practical, and teaching methods.

The job marketplace requires specialists who are able not only to think abstractly and logically, to generalize information, but also to create a fundamentally new creative product using the newest information and communication technologies. With their help, educational institutions create a global educational environment, which can improve quality of education and learning administration, realize the integrated curricula into practice, and provide positive motivation for informal and non-formal education.

**Aims and Objectives.** The aim of the research is to study pedagogic and psychological features of E-learning tools, which can help to inhibit the formation of emotional disorders of the applicants.

The objectives are: (1) to consider the main pedagogical goals of E-learning; (2) to determine the means of information and communication technologies; (3) to describe psychological peculiarities of using E-learning tools; (4) to define the preventive means of negative emotional states of higher education applicants.

**Object and Subject.** The object of the research is E-learning tools.

The subject of the research is the information and communication technologies, which prevent negative emotional states of higher education applicants.

**Methods.** To attain the aim and to accomplish the objectives, a complex of methods has been used: theoretical: analyses – to study the elements of the research

object and its qualities, synthesis – to study the object of investigation as an integral system, generalization and systematization of literature – to determine the fundamental principles of studying the object of investigation; empiric: psychodiagnostics methods – tests and techniques – to diagnose emotional states of personality according to the research aim; methods of data processing: quantitative and qualitative; techniques of statistical processing.

**Analysis of recent research and publications.** E-learning is based on innovative computer, multimedia and Internet technologies to improve the quality of education, facilitate resource access and networking.

The main pedagogical goals of E-Learning are: (1) to develop the information society; (2) to actualize an education; (3) to intensify educational process; (4) to form the competences and skills in higher education applicants; (5) to manage the educational process; (6) to extend scientific and methodological experience [1].

The level of knowledge, skills, and competences acquired by an applicant, is reflected in higher education standards of quality of higher education. The results of quality assurance include the outcomes of educational program of institution, the state of information support, and the results of training of higher education applicants, the level of professional competence of future specialists, the level of satisfaction with the quality of higher education of the applicants.

When preparing the specialists in transportation area, the educational institution uses blended education with appropriate quality assurance to improve lifelong learning, develop information and communication skills and competencies. The mastering the applicants of the specialty “Transport” is provided with modern information and communication methods that allow to solve the engineering problems, to get the basic skills of mathematical modeling of physical processes, to acquire a system of skills in the algorithmization of the computational process of the mathematical model.

The objectives of the educational program “Transport” are achieved by acquiring the following competences: 1) instrumental (the ability to conduct research at the appropriate level; the ability to search and analyze information from various

sources using modern information and communication technologies; the ability to choose and apply in practice methods of research, planning and carrying out the experiment; the ability to interpret the results and draw conclusions in the field of production, operation and repair of transport facilities; the ability to perform the research work with elements of scientific novelty; the ability to understand and take into account social, environmental, ethical, economic and commercial considerations that affect the implementation of technical solutions in transport; the ability to research, analyze and improve technological processes of transport; the ability to scientifically substantiate the choice of materials and equipment to implement the latest technologies in transport), 2) interpersonal (the ability to show initiative; the ability to act on the basis of ethical considerations), 3) systemic (the ability to identify transport objects to improve technology; the ability to analyze and synthesize when studying technical systems of transport objects; the ability to apply the laws and principles of engineering in specialization, high-level mathematical apparatus for the design, construction, production, installation, operation, maintenance and utilization of objects and processes in the field of transport).

Upon completion of educational program, the future specialists work as managing directors and chief executives, mechanical engineers, higher education teachers.

**Research methodology and organization.** According to Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), the learning environment and links to innovation play an important role in quality assurance [2]. An institution should have the educational program, which includes specialty competences and the intended learning outcomes. The purpose of the educational program is to provide training for specialists capable of solving nonstandard tasks, making optimal decisions, generating original and effective ideas for solving professional problems. The accent is made on the implementation of innovations [3]. Educational institution uses the benefits of modern information and communication technologies to form a skillful personality.

Nowadays, the individual has to master the qualities of an open dialog system in order to cope with life and professional crises, conflicts, the stages of selfdetermination. Personal and professional development should provide the upward movement through the formation of different competences. The achievement of basic competencies is not a sufficient result of education. The competences are the background for the achievement of skills when studying the basic disciplines of professional orientation. At the same time, a psychological factor, the ability to respond to changes, the flexibility in taking new decisions, the ability to overcome the stereotypes in thinking process, are one of the main problems in implementing the competent approach into education.

The job marketplace requires specialists who are able not only to think abstractly and logically, to generalize information, but also to create a fundamentally new creative product using the newest information and communication technologies. With their help, educational institutions create a global educational environment, which can improve quality of education and learning administration, realize the integrated curricula into practice, and provide positive motivation for informal and non-formal education.

In the context of information and communication technologies, multimedia, the Internet world network, and distance training courses is used. It helps to activate the cognitive activity of the applicants, to realize their creative abilities and to adapt the educative process to every applicant [4]. One of the main tools of educational work is multimedia lecture. With the help of information technologies, it involves demonstration of learning material on the big screen accompanied by a lecturer.

The information and communication technologies are the mediators between a learner and a teacher. Owing to the mediation, the conditions for perception, transfer and assimilation of learning material are formed.

The applicants use the information-retrieval systems, educational portals, library directories and file servers in the multimedia education environment. Multimedia training tools ensure the independence in acquisition of knowledge and the formation of professional competencies, the capacity for self-development. The

applying of multimedia as a tool of education helps to represent the information in different ways and to realize a creative approach in getting knowledge. Multimedia technologies can be used as an interactive multichannel cognition tool. It makes sense to the principles [5] when organizing an educational process using multimedia technologies.

Blended learning combines traditional academic learning with online courses, psycho-pedagogical theories, and technologies [6]. The lecturer embodies the role of a tutor since the communicative orientation of the educational process requires that both the applicant and the lecturer learn from each other. The classroom training is required. The applicants can adapt to the social environment as to the basis for professional activity. During the lectures or workshops, the applicants with a tutor analyze the effectiveness of their co-working. The lecturer creates a network, places educational materials with the public (lectures, instructions, tasks), checks the quality of tasks and tests, interacts with the applicants with information technologies. The applicants can be acquainted with the educational materials at all reasonable time, manage it, reinforce a skill, transfer the developed method of work to another material.

The lecturer creates a message for the applicant and the applicant plans his own work on a topic or a course. According to [7], the planning stage is one of the important in the education process. It concerns changes in personality of an applicant and his vision of the development of himself as a person in the future. The applicant evaluates his own achievements, formulates the goals, builds a program to correct his weaknesses.

One of the blended learning means is using the Massive Open Online Courses (MOOCs) during the study of the academic discipline. MOOCs can be provided to improve knowledge on any module of the academic discipline.

**Results of the study and their discussion. Methodological or scientific value. Among** the psychological characteristics of persons who use information and communication technologies, the one can distinguish persistence in achieving a goal, independence, making decisions based on their own criteria, creative activity,

introversion, self-awareness, low emotional intensity in communication, selfabsorption.

One of the negative aspects of information system development is computerbased anxiety. It is a fear that arises when working on or thinking about the computer. Although negative emotions may stimulate the increase in activity and lead to the success. The main stress-producing factor is the loss of control in compatibility with a computer. Activity, self-starter, self-confidence, emotional stability, and optimistic view of life help to overcome stress and improve the stress resistance.

There are many positive effects when using the information and communication technologies. The advantages are observed in testing activities. The lecturer gets quick achievement of test results. The user is free of time-consuming operations and can concentrate on solving professional tasks. The recording of test results is accurate and without errors. It is possible to carry out massive research through parallel testing.

The usage of information technologies helps to improve the operational efficiency due to standard instruction and tasks, which are independent of gender, age and mood. It is useful to get total results. The lecturer can turn a professional task into a computer version. He can create his own procedures, questionnaires, necessary for a concrete situation.

Information and communication technologies comprise the direct interaction with colleagues and applicants through the Internet, email, the local network of the educational institution. They make possible sending necessary information and holding the consultations. When using multimedia technologies in the educational process, the structure of a lecture is not changed. The lecturer varies timeframe, tables, tasks.

The usage of information and communication technologies as a tool of cognition helps in representing information in various ways and carries out a creative approach in working knowledge. In the learning process, multimedia technologies

are used as an interactive multichannel cognition tool [8]. It helps to develop the creative divergent thinking because the user is looking for several possible solutions.

Multimedia lecture as a combination of visual and audio effects combines text, sound, graphics, photos, videos in a single digital representation. This didactic tool creates efficiencies of perceptual and mnemonic processes, develops cognitive activity of the applicant, increases his motivation. It contains textual information, sound bites, diagrams, photos.

Multimedia lecture has a hypertext nature and establishes a balance in understanding the information. The slide presentation helps to structure and interpret information, activates the creative abilities of the user. The lecturer creates reflective tasks, the conditions for their alternative solutions and interactive relationships.

Multimedia learning tools influence the formation and development of human mental structures, including thinking. Images and sounds do not direct the user from the object to another one with the intermediate conclusions, as in the perception of printed information. Instead, they create the patterns of recognition that appeal to the sensual side of the subject.

The computer technologies may increase the capacity of human thinking and cause some changes in the structure of mental activity. In the continual and distant learning environment formed by the Massive Open Online Courses, the processes of organizing and interpreting multimedia information are essential. This information can be encoded and represented on screen in the form of mathematical symbols, tables, graphs and diagrams, images of processes. They are supplemented by sound and color images.

**Preventive Means of Negative Emotional States of Applicants.** The emotional sphere of the applicants is vulnerable to various disorders – ranging from indifference, despondency, loss of life interest and lethargy developing into apathy and depression to irritability, aggression and uncontrolled fits of anger. There can be a state of “emotional torpidity”, lassitude or exasperation and inability to feel joy, love, or creative impulse. Sometimes the applicants experience helplessness in situations, which are related to self-esteem, and significant situations. Interpersonal

conflicts intensify their emotional states. There can be fits of acute remorse that lead to self-oriented aggression, including self-blame and self-punishment. Anxiety grows, agitation intensifies, and there appear mood fluctuations and phobias. They may suffer from disturbed sleep: insomnia, problems with falling asleep, and nightmares. Depression carries a high risk of suicide.

The applicants of higher education institutions may have such prevalent manifestations of negative emotional states as general anxiety, impaired memory and concentration, aggression, unmotivated vigilance, and intrusive memories of the traumatic events. General anxiety is a symptom that occurs most frequently: at a physiological level (back pain, stomach cramps, and headaches), in mental health (constant anxiety, obsessive uneasiness, and “paranoid” phenomena), and in emotional experiences (apprehension, self-doubt, and a guilt complex).

The problem of sleep disorder and all entailed consequences are further aggravated by the applicants’ way of life. The heavy academic workload forces them into studying at night; meanwhile, apathy, a feeling of emptiness and senselessness, despair, a feeling of abandonment, loneliness, anger, guilt, fear, anxiety and helplessness prevent them from concentrating while studying or falling peacefully asleep, which exacerbate the situation. The applicants who used to study well try to conform to their level of acquiring knowledge. However, due to psychological, social, and economic problems, their academic rate can go down, which will have a negative impact on their self-esteem and general condition. The motivational constituent of personality will be the one to suffer the most.

There are serious problems in the field of interpersonal communication – in spousal and cross-generation family relations, and especially in young people’s coeval interaction with the same and opposite sex. Grief affects one’s relationships; the obvious traits are indifference, annoyance, and aloofness.

It becomes difficult to concentrate on anything to do or finish doing; for a while, a complicated activity can be perceived as something beyond one’s abilities at all. People with a posttraumatic stress disorder experience certain difficulty even in distinguishing between relevant and irrelevant stimuli; they find it impossible to

ignore anything extrinsic and choose from the context the most relevant information, which diminishes involvement in habitual activities and strengthens one's obsession with the trauma. Consequently, such people lose the ability to react flexibly to changing environment, which can result in studying problems and seriously impaired learning skills [9].

The intensity of the stressful situations impact involving a threat to human existence is so large that individual characteristics or previous neurotic states do not play a decisive role in the genesis of negative emotional states. Their presence can contribute to its development and can be reflected with time. However, negative emotional states can develop in catastrophic circumstances and concern almost everyone even in the full absence of obvious personal inclinations [10].

The excessive subjective complexity of a task, high responsibility for the result of the activities, influence of different negative obstacles, lack of information or lack of time, information redundancy are the factors of the emotional tension. Mental tension has a mixed effect on the activities. Its prominent forms can cause mental disfunctions and reduce the efficiency and reliability of the person's activities.

In the situation of examinations, there is level decrease in thinking, attention, memory and in the indicators of self-esteem scale, well-being, mood, working capacity. State anxiety and self-distrust may lead to the affective experience. Anxious applicants sharply react to their failures, work slowly and with a great number of mistakes in a compressed period. Fear of failure is dominated over pursuance of obtaining success. Success response has a big power for them.

The cognitive assessment of situation automatically causes the reaction of the organism to threat stimulus. Countermeasures appear and they are intended to decrease difficult situations. Negative emotional state, which is not relevant to intensive difficult situations, prevents the formation of adaptive behavior, leads to disturbance of behavioral integration and general disorganization of the human psyche [11].

Since the usage of E-learning tools, blended learning for applicants have positive effect on their mental activity, develop their personality, thinking processes, mental functions, it can be assumed that they have positive effect on the emotional states.

One of the blended learning means is involving the applicants in studying the Massive Open Online Courses within the limits of academic disciplines available during the learning process.

The applicants of the Donbas National Academy of Civil Engineering and Architecture (DonNACEA) of the specialty “Transport” study the course “Information Technologies in Scientific Research”. It is one of the compulsory academic disciplines in specialization training of future specialists in transport. When analyzing the results after learning the discipline it has been revealed several negative factors. The applicants' indicators of mood, attention, self-esteem scale, well-being, working capacity have the tendency to descend. They sharply react to their failures, work slowly and with a great number of mistakes in a compressed time frame. Fear of failure is dominated over pursuance of obtaining success.

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In 2017-2019, the applicants of the Donbas National Academy of Civil Engineering and Architecture (DonNACEA) have been offered to study the courses within the platform Prometheus. The applicants of the first and the fifth courses of the DonNACEA have taken part in the empirical research.

The applicants have been offered: (1) the questionnaire – to study the level of satisfaction with completing the online course, the degree of motivation for blended learning, the degree of effectiveness of the results; (2) the test “Self-assessment

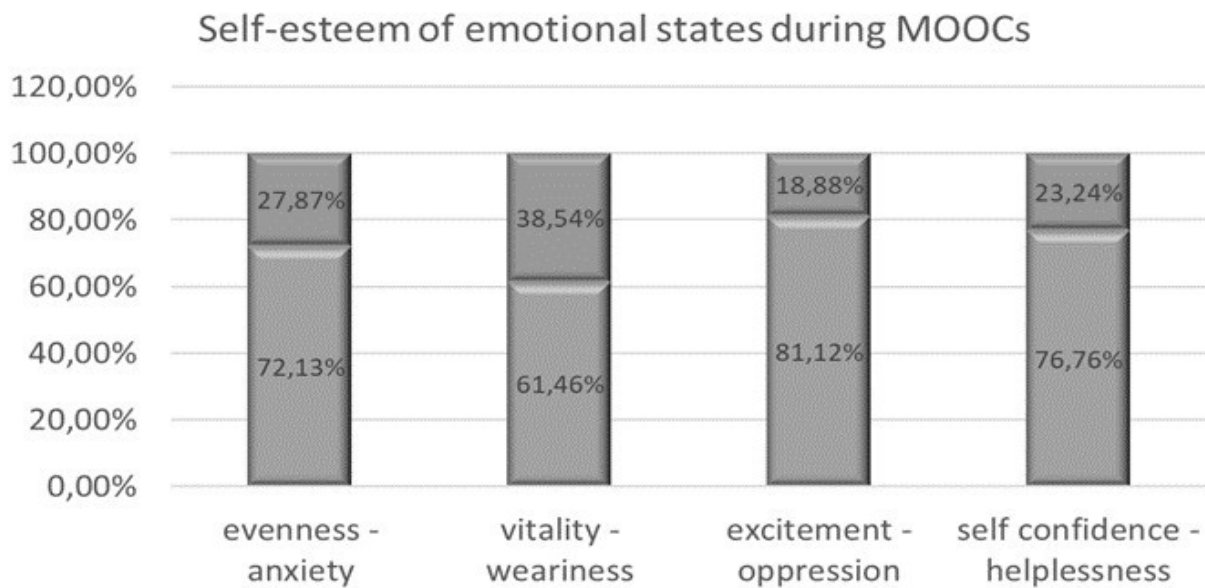
technique of emotional states” (A. Wessman and D. Ricks) – to study the self-esteem of the emotional states (evenness, anxiety, vitality, weariness, excitement, oppression, self-confidence, helplessness) during massive open online courses.

According to the self-reflection inquiry, the following results have been obtained after completing the course. For 93% of the respondents, the online course has helped them to master the courses within the platform Prometheus. For 85% of respondents it has been convenient to continue learning outside the computer classes. Only 46% of the applicants of the first course and 24% of the fifth course pass the massive online courses on their own, when it is not the scope of classroom studies.

The applicants additionally find out and learn new material in the online courses. They master the subject of their professional training and gain new competencies. The respondents like to study in their own schedule when they have free time. They note the clearness of instructions, the availability of videos, and the possibility to repeat the material and to solidify the knowledge with the help of exercises.

In the fifth course, the percentage of self-employed applicants is reduced to 23%. This fact may indicate the unwillingness to spend time on self-education and a lack of motivation of the applicants to study. More than 70% of both the first and the fifth courses applicants need additional online courses to develop their own competencies necessary for future professional activities. This is especially actual for the first-year applicants. The applicants of the first course want to have free access to additional material, scientific and methodological literature, textbooks. They are looking for being acquainted with the latest trends in the relevant professional field.

During the massive open online courses (see Fig.1), most of the applicants feel evenness, vitality, excitement, self-confidence.



**Fig. 1. The self-esteem of the emotional states during massive open online courses**

72% of respondents feel themselves generally confident and free from anxiety during massive open online courses. They have easy manners. 61% of respondents feel themselves fresh and full of energy. They are moderately vigorous. 81% of respondents are in a good mood. They are excited and full of enthusiasm. 77% of respondents feel themselves confident in their abilities. They are sure that their abilities are well, and the professional prospects are good. They feel themselves competent.

After passing the practical training by the applicants of specialty “Transport”, the professional competence has been measured. Criteria characteristics of professional competence are: 1) adaptation, psychological comfort in manufacturing, 2) realization of expectations of the applicants, 3) problems in manufacturing process [12].

The cognitive processes, motives and values, emotional-volitional regulation of 61% applicants have good indicators of their development. They have the state of personal and psychological comfort. The expectations of 58% applicants in relation to professional and personal qualities of enterprise managers, in regarding the professional activities of managers, in relation to the process on enterprise are

coincided with their expectations before passing the practical training. Only 4% of the applicants have difficult problems during the practical training.

For the formation of professional competence of the applicants, one of the most efficient means is the combination of traditional academic learning with online courses, psycho-pedagogical theories, information and communicative technologies using the learning tools: multimedia lectures, group projects, collective participation at scientific conferences.

In general, the applicants experience positive emotions when taking the online course independently.

**The main conclusions.** Thus, the review of the scientific literature and the results of the questionnaire and the test conducted during the massive open online courses and after their mastering, make it possible to admit the advisability of their usage. Thus, the introduction of blended learning helps applicants to grow as specialists and evaluate their own achievements.

The usage of E-learning tools has positive effect on professional activities of the applicants and positive effect on their emotional states. During the massive open online courses, they feel evenness, vitality, excitement, self-confidence. The results, obtained during the empirical research, allow the researchers to get more detailed data about the emotional states of the applicants. The massive open online courses may be recommended as an effective means of the blended learning. It is planned to transfer the academic discipline “Information Technologies in Scientific Research” for the future specialists in the field of transport into the MOOCs format and locate the course on the Prometheus platform.

Among the **prospect of our further research**, finding out the predictors of the applicants' emotional states in E-learning environment should be noted.

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