Chornobai B. V. Peculiarities of assessing agricultural engineers readiness to apply innovative technologies during the study of agricultural machinery

When reforming education in Ukraine, global trends in global integration and changes in the educational paradigm should be taken into account and they require a highly qualified, competitive specialist. Accordingly, the requirements for professional training of vocational higher education institutions are growing, which creates a problem of forming readiness to use innovative technologies in the context of the professional training and personal development of intending specialists in agricultural engineering as one of the most important issues. There is no unambiguous understanding of the essence of the problem so there is no single way to solve it.

Therefore, the article defines the criteria of forming readiness for the use of innovative technologies by intending specialists in agricultural engineering (mechanical technicians) in their further professional activity. A review of recent publications on forming readiness, as well as on the definition of criteria, indicators and levels of readiness was conducted.

The analysis of the concept of “criterion” and “indicator” was made, taking into account several approaches to the interpretation of terms, such as the use of one language dictionaries, including the pedagogical interpretation. It should be noted that the “criterion” is a broader concept in its meaning than the term “indicator” and is defined as a measure, it was specified in the dictionaries and definitions of many scientists, i. e. “criterion” is a rule that should be used in diagnosing.

Four main criteria for forming readiness were suggested: cognitive, motivational, activity, personal. For each defined criterion, several indicators of its manifestation were indicated. On the basis of the selected criteria and indicators of their manifestation the following levels of formation of readiness of intending specialists in agricultural engineering (mechanical technicians) were developed: low, medium, sufficient and high.

Thus, we singled out a four-level scale for assessing the readiness to use innovative technologies by intending specialists in their further professional activities. Due to this, we can state that advancing these levels of readiness of the intending professionals can provide a better level of training mechanical technicians.

Key words: *specialist in agricultural engineering, criterion, indicator, level, innovative technologies, readiness, institution of vocational education, professional activity.*

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Shumylo M. Yu.

THEORETICAL PRINCIPLES OF MEDICAL EDUCATION DEVELOPMENT IN THE USA

Studying the history of the formation and development of the medical education system revealed the peculiarity of its individual stages, the specifics of the economic level of American society, political situation, social needs and culture of formation in a certain period. At each stage, the task of meeting the educational needs of American society was addressed. The article analyzes the state of research of the investigated problem in domestic and foreign scientific sources. It is generalized that the main attention of scientists is focused on the general issues of formation of the medical education system: its beginning, modernization and reform at different stages of development. The historical and pedagogical aspect of studying the system of doctors’ professional training is one of the most important in the research, as it provides an understanding of the achievements or drawbacks of the past. Modern higher medical education in the United States is a unique phenomenon, largely due to its historical development, full of social and economic challenges, and the ability of American government to respond quickly and effectively to the needs of the time. An important milestone in the development of American medical education was the creation of coordinating and monitoring organizations. The National Board of Education was established to coordinate the education system, and the American Medical Association and the Association of American Medical Colleges were established in medical education. This was the beginning of the introduction of educational standards provided in medical schools. Significant changes in the field of higher medical education in the United States started with the publication of a report by A. Flexner, who proposed to reduce the number of medical schools, complicate requirements for admission to medical schools, involve staff and students in research, strengthen state control in licensing medical schools. These Reformation processes became the point of gradual development of modern American medical education. In the twentieth century, the accumulation of knowledge and the development of medical science contributed to the differentiation of the medical profession in certain subsections.

Key words: *medical education, education system, education development, formation of education, theoretical principles, scientific research, organization, association.*

(статтю подано мовою оригіналу)

The current state of higher medical education in the United States is the result of centuries of history and culture of this country, as well as the influence of European universities that launched medical education. The major reform of medical education in the United States took place in 1910 after a report by A. Flexner [4], a researcher at the Carnegie Foundation who established to improve the level of teaching. Thus, the researcher inspected 155 existing American and Canadian medical schools. In his report, he formulated conclusions, criticizing the current system of

medical training and revolutionized the structure of higher medical education. In his opinion, the inadequacy of the higher medical education in the United States was expressed in lack of equipment in classrooms, insufficient number of teachers and inadequate admission requirements, thus, many graduates did not have basic professional knowledge and skills. The problem was due to a large number of commercial medical schools and the lack of admission selection. Implementing his own principle of "educational patriotism" – the predominance of social and educational interests over personal needs, A. Flexner proposed the following solutions: reducing the number of medical schools to 31 and improving the quality of their activities, integrating medical schools in colleges or universities with educational hospitals. The researcher identified criteria that are still followed in US medical education.

A number of researchers studied certain trends, aspects, problems and features of medical training in the United States. A thorough study of the history of American education from pre-colonial times till current days is presented in the fundamental works of American educational historians W. J. Urban and J. L. Wagoner. Analyzing the main stages, the authors provide an objective overview of each period in the development of American education on the background of national and world events. This is the first large-scale study of Indian colonization traditions, including educational ones. Besides, scholars are focusing on the education of national minorities and women. The importance of the study also implies that significant attention is focused on the study of the main contradictions of American education in the 21st century [13]. L. D. Web considers the formation of the US educational system in close connection with historical events. In the study of American higher education, the author proposes a new methodology for interpreting the significance of historical events for education, which is based on critical reading of the events and phenomena described by the reader [14]. M. Kenneth Ludmerer deals with the history of medical education in the United States, particularly in the 19th and 20th centuries. His work focuses on understanding medicine in broad intellectual, social and cultural contexts [9]. A thorough study of the current state of medical education was conducted by G. Wong. The author explores the internal and external problems, which medical students are facing. The main internal problems, according to the researcher, are the need to focus on the disease with relatively little attention to patient behavior, inconsistencies between inpatient and outpatient learning, excessive focus of teaching staff on research at the molecular or submolecular level, ignoring more basic research. External challenges include the exponential growth of knowledge, related technological innovations and social change. Solving these problems, according to the author, requires distinct institutional leadership [15].

Among Ukrainian scientists, engaged in complex systematic research of medical education in the USA, are T. I. Horpinich-Khalyboha and Yu. S. Hrebenyk-Kozachenko. Theoretical and organizational principles of professional training of future doctors in US universities became the subject of research of T. I. Horpinich-Khalyboha. The author conducts research within the 17th – early 21st century, analyzes the experience of training future doctors in US universities, which is manifested in the substantiation of theoretical and practical principles of the problem, features of forming a competent doctor at the undergraduate and postgraduate stages [1]. Organizational and pedagogical foundations for the formation of students' communicative culture in medical colleges in Great Britain and the United States have become a scientific achievement of the researcher Yu. S. Hrebenyk-Kozachenko [2].

Thus, analyzing the papers devoted to the study of various aspects of the medical education system in the United States, the following aspects can be inferred:

– not only the theoretical foundations, but also practical experience (methods, techniques, technologies) in US educational institutions of medical profile have been analyzed in scientific studies;

– various aspects of the outlined issue have been presented, in particular: cultural, social and political, pedagogical, economic, psychological, legal, historical, methodological ones;

– issues of training competitive specialists, introduction of more advanced standards of training are currently attracting attention;

– improving the quality of medical education is associated with the need for highly qualified specialists who must be prepared for responsible professional activities, and further lifelong learning;

– the experience of the US medical education organization, reflected in the works of American scientists, is valuable for understanding and borrowing its positive ideas for other countries, including Ukraine. It has been found that medical education in the United States, as a pedagogical phenomenon, has not been comprehensively analyzed, despite the undeniable practical value of research by Ukrainian and foreign scientists.

Literature review has been conducted to analyze articles referring to preconditions of medical education development in the USA and legislative orders have been analyzed.

The **aim of the paper** is to analyze the role of economic, political, cultural and social phenomena in development of American medical education.

An important stage in the development of higher medical education in the United States was the work written by American educator A. Flexner, which was published in 1910. In 1917, special guarantees were adopted for professional training in public schools, and in 1918, the National Commission on the Reform of Secondary Education proclaimed basic principles that in some way influenced the content of the initial stage of higher education [12, p. 312].

The formation of market relations in general and in higher education in the United States was accompanied by a complete lack of federal control. As a result, the activities of many educational institutions were marked by abuse, elements of deception and fraud. In response, non-governmental associations of professionals working in the field of education, and later associations of higher educational institutions were established. By the end of the 19th century,

the creation of such associations and unions became widespread. In 1918, the American Council of Education was founded. Educational institutions of all types are members of this organization. In order to combat unscrupulous educational institutions, which, in fact, sold diplomas of education and documents confirming the award of academic degrees, public professional associations were established in the late 19th century to solve the problem of recognition of diplomas issued by educational institutions and their accreditation. In six US cities, regional associations were formed in the most prestigious universities and colleges, developing a system of criteria for determining the level of an educational institution. Lists of accredited higher educational establishments, agreed by the federal and state governments, appeared, which stated that they did not interfere in the accreditation process to ensure university autonomy [7, p. 654]. Finally, in 1949, the National Commission on Accreditation was formed, which involved the presidents of 42 universities [12, p. 493].

If World War I did not play an important role in the development of higher medical education in the country, as the United States did not participate actively, the flu pandemic became a key to the development of epidemiology. From 1917 to 1923, the American Red Cross organized a number of educational and prophylactic programs aimed at combating infectious diseases such as typhus and tuberculosis, initiating the volunteer movement. In the middle of the twentieth century, the US higher medical education system was influenced by several important factors that were crucial to its development. Thus, in 1940, the Report of the Commission on Higher Medical Education was published, which for the first time described the process of training interns and residents. The Medical Education Liaison Commission was established in 1942 [6, p. 285].

US involvement in World War II played an important role in the development of medicine and medical education. During this period, there was a rapid accumulation of knowledge in the field of transfusion medicine, military traumatology, surgery and burn surgery, psychiatry, infectious diseases. The United States provided powerful medical care: blood and plasma were collected in large quantities in the United States and sent frozen to the battlefield, skilled workers were recruited to serve in special operation teams, antibiotics and other drugs were delivered to military hospitals.

During the Second World War, educational and scientific activities in the field of medicine developed rapidly. Research was carried out in the field of thoracic and abdominal surgery, traumatology, toxicology, pharmacology, psychiatry. This period was also marked by the growing social significance of the nursing profession. In general, this specialty gained popularity in the late nineteenth century. The School of Nursing at Harper Hospital in Detroit was opened in 1884. However, there were not enough educational institutions to provide educational services for future nurses, so the number of qualified nurses in the United States was small at the beginning of the war. In 1940, the American Nurses’ Association, the Red Cross, and the federal government decided that the network of relevant educational institutions had to be expanded. In addition, a large number of women of all ages were willing to volunteer and help with medical procedures. As a result, in 1943, the U.S. Nursing Cadet Corps was established, which offered free educational services to students between the ages of 17 and 35 who successfully entered the school. Training was provided in four basic areas – medicine, surgery, obstetrics and pediatrics. The experience of the Nursing Cadet Corps formed the basis for further training of nurses in the United States and had a positive impact on the establishment of this profession.

In the 1960’s, significant changes occurred, which were marked by considerable successes in various domains, including medicine. Opinions about the need to restructure medical and educational units in order to strengthen the prestige of the family doctor profession were becoming more and more persistent in academic circles. In 1966, the Willard Committee (Family Medicine Education Committee, named after its chairman), along with two other authoritative commissions, published a report recommending a change in the ratio of doctors-specialists to general practitioners in the United States and improved training in the field of family medicine. In addition, the Willard Committee called for the introduction of a new specialty in medical health care called “family practice”, developed its concept and outlined the relevant curriculum. The post-war period gave impetus to the development of higher education not only in connection with the emergence of new social needs, but also due to the influx of young people in need of education. Thus, in 1944, the US government established educational privileges for veterans and participants in World War II by adopting the so-called Servicemen’s Readjustment Act [5, p. 121].

To ensure their adaptation to peaceful living, as well as for economic reasons, the US federal government provided educational loans that allowed a significant number of young people to enter higher education, bringing with them the financial resources needed to develop universities and colleges. In general, the adoption of measures to adapt combatants to the conditions of peaceful life was an important step in US educational policy, as this was the basis for the emergence of a system of retraining citizens. The return of thousands of veterans to colleges resulted in the Higher Education Committee’s decision to reconsider the role of free economic education in postwar America. As a result, the so-called Truman Commission Report was published in 1947, which called for radical changes in the higher education system, the creation of a wider network of public colleges, and a doubling of the number of students enrolled in colleges by 1960 [8, p. 121].

Another influx of participants in hostilities in US universities occurred after the Korean War. The Veterans Adjustment Act of 1952 introduced a monthly allowance for war veterans. The benefits to veterans of the Vietnam War (Veterans Readjustment Benefits Act of 1966) were similar. In essence, both documents were a logical addition to the 1944 Act, as were subsequent amendments to them after the Iraq war. A separate milestone in the formation

of the higher education system in the United States is the struggle for equal rights for people of different ethnic and religious backgrounds, as well as those with disabilities. For example, in 1946, the Los Angeles District Court revealed that teaching Mexican children in some school facilities violated constitutional rights. In 1964, Congress passed the Civil Rights Act, which prohibited discrimination in public places, the education system, and employment. Among other documents that declared equal educational rights of citizens, it is worth noting the Indian Education Act of 1972 (Indian Education Act), which enshrined the right of Indians to comprehensive education based on their cognitive needs [8, p. 224].

The bilingual education of the American population was also improving. Thus, in 1963, one of the primary schools in Miami introduced bilingual education for immigrants from Cuba for the first time. This right was officially enshrined in the Elementary and Secondary Education Act of 1965, which, among other aspects, established funding from educational institutions and libraries for the purchase of literature about / for children of other races. The Improving America's Schools Act, signed by Clinton in 1994 declared an increase in funding on bilingual and multicultural education. A special place in the history of the American education system is the provision of educational rights to people with disabilities. Thus, in 1971, the federal court of Pennsylvania granted the right to free education to children with disabilities [10, p. 84].

In 1975, The Education for All Handicapped Children Act (EAHCA) was finally adopted, which guaranteed free appropriate education for children with disabilities. The Law had to be implemented by 1978 [8, p. 184].

In addition to assistance and social protection for people with disabilities, the United States developed a reliable system of educational support for low-income people. Indeed, the state, universities, and numerous foundations provided broad financial support to citizens for education. Thus, the Elementary and Secondary Education Act and the Higher Education Act of 1965 dealt with federal funding for children and students from low-income families, which later initiated the creation of numerous educational programs. These laws provided significant federal support for education. Another significant impetus in the development of the US education system occurred after the launch of the Soviet Union's first artificial satellite of the Earth in 1957 [8, p. 225].

In America, in response to the launch of the Soviet Union artificial satellite, a number of laws were passed, including the National Defense Education Act of 1958. This law directly defined the main goal of state policy in the field of education – strengthening the military and technical capacity of the United States. This law contributed to the growth of allocations for the development of basic research in universities, the involvement of highly qualified foreign specialists for the training of national personnel and the strengthening of the material and technical base of the Free Economic Zone.

In 1963, the law was passed on the availability of higher education, which authorized the loans for the construction of colleges. The Vocational Education Act of 1963 amended and expanded vocational education programs to provide opportunities for work and study. However, this large financial flow did not bring the expected results, which became clear at the turn of the 70's and 80's. In this context, there were many publications researchers, who analyzed the current state of the education system.

In 1991, a new educational initiative was adopted, the key points of which were: the development of educational standards in five (English, mathematics, science, history and geography) core subjects; development of a national testing system, the results of which had to be accepted when admitting students to universities and colleges [3, p. 42]. This initiative played an important role in shaping the concept of education in the United States, but it was not effective enough, and in the late twentieth century President Clinton's "Call to Action for American Education in the 21st century" was published, declaring that in order to prepare America for the 21st century the country needed a strong school with clear, achievable educational standards and high discipline. He issued the following 10-point call to action for American education in the 21st century: 1) set rigorous standards, with national tests in fourth-grade reading and eighth-grade math; 2) make sure a talented and dedicated teacher is in every classroom; 3) teach every student to read independently and well by the end of the third grade; 4) expand Head Start and challenge other parents to get involved in their children's learning; 5) expand school choice and accountability in public education; 6) make sure schools are safe, disciplined, and drug free, and instill American values; 7) modernize school buildings and support school construction; 8) open the doors of college to all who work hard and make the grade, and make the thirteenth and fourteenth years of education as universal as high school; 9) help adults improve their education and skills by transforming federal training programs into a simple skill grant; 10) connect every classroom and library to the Internet by the year 2000, and help students become technologically literate [11].

Conclusions. Thus, studying the history of formation and development of the education system revealed the uniqueness of its individual stages, the specifics associated with the social and economic level of American society, the trend of its cultural formation over time. At each stage, the task of meeting the educational needs of American society was set and fulfilled whenever possible.

The historical and pedagogical aspect of studying the system of professional training of doctors is one of the most important, because it provides a critical understanding of the achievements or defeats of the past. Modern higher medical education in the United States is a unique phenomenon, largely due to its historical development, full of social and economic challenges, and the ability of American government to respond quickly and effectively to the needs of the time. This is confirmed by a retrospective analysis of the development and functioning of the higher medical education system in the United States during the 17th – 21st centuries. The formation of the medical

education system in the United States began with the colonization of North America. In organizing the educational process, the first American colleges copied the English system of higher education. After the country gained independence due to economic development and rapid population growth, there was a need to meet the needs of health and education.

As a result, significant changes began in the system of professional training. In particular, the number of colleges and universities increased, and two basic principles of American higher education were formulated: the autonomy of the institution and the freedom of students to choose subjects and courses. Military conflicts in the United States and abroad served as a stimulus for the development of certain branches of medicine and the promotion of the medical profession.

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Шумило М. Ю. Теоретичні принципи розвитку медичної освіти в США

Дослідження історії становлення й розвитку системи медичної освіти дало змогу виявити своєрідність розвитку її окремих етапів, специфіку, пов'язану з економічним рівнем розвитку американського суспільства, політичною ситуацією, соціальними потребами та культурою становлення в певний період часу. На кожному етапі вирішувалися завдання щодо задоволення освітніх потреб американського суспільства. У статті проаналізовано стан дослідженості окресленої проблеми у вітчизняних і зарубіжних наукових джерелах. Узагальнено, що основну увагу вчених акцентовано на загальних питаннях формування системи медичної освіти, а саме її становленні, модернізації та реформуванні на різних етапах розвитку. Історико-педагогічний аспект вивчення системи професійної підготовки лікарів є одним із найвагоміших у межах дослідження, оскільки він забезпечує осмислення досягнень чи поразок минулого. Сучасна вища медична освіта в США є унікальним явищем здебільшого завдяки історичному розвитку, повному соціально-економічних викликів, і здатності американського правління швидко й ефективно реагувати на потреби того чи іншого часу. Важливими віхами в розвитку американської медичної освіти стало створення координаційних і контролюючих організацій. Для координації системи освіти було засновано Національний комітет із питань освіти, а для координації медичної освіти – Американську медичну асоціацію та Асоціацію американських медичних коледжів. Це стало початком упровадження стандартів освіти, яку надають у медичних навчальних закладах. Суттєві перетворення в галузі вищої медичної освіти США з'явилися з публікацією звіту А. Флекснера, який запропонував знизити кількість медичних шкіл, ускладнити вимоги для вступу до медичних навчальних закладів, залучати працівників і студентів до наукових досліджень, підсилити контроль держави в ліцензуванні медичних навчальних закладів. Ці реформаційні процеси стали точкою поступового розвитку сучасної американської медичної освіти. У XX столітті накопичення знань і розвиток медичної науки сприяли диференціації медичної професії на окремі підгалузі.

Ключові слова: *медична освіта, система освіти, розвиток освіти, становлення освіти, теоретичні принципи, наукові дослідження, організація, асоціація.*

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ВПЛИВ ПОМІРНИХ ФІЗИЧНИХ НАВАНТАЖЕНЬ І ПРИРОДНИХ ЧИННИКІВ НА ФУНКЦІОНАЛЬНИЙ СТАН ОРГАНІЗМУ СТУДЕНТІВ

Досліджено вплив помірних фізичних навантажень на функціональний стан і рівень фізичного здоров'я студентів під час канікулярного зимового відпочинку в гірській місцевості. Проведено анкетування студентів І курсу Одеської національної академії харчових технологій щодо самооцінки стану їхнього здоров'я, з'ясовано провідні мотиваційні чинники до занять фізичною культурою. Фізичні тести та функціональні проби дали змогу встановити здебільшого низький рівень фізичного здоров'я у студентів. У дослідженні використовувалися такі методи: теоретичний аналіз та узагальнення наукових джерел, антропометричні й фізіологічні методи, педагогічне тестування, метод математичної статистики. Вхідні тестування та функціональні проби дали можливість встановити, що в більшості студентів І курсу переважає низький рівень фізичного здоров'я. Наприкінці експерименту отримано результати, що свідчать про ефективність застосування запланованого обсягу фізичних навантажень в умовах зимового відпочинку. Спортивні зайняття на дозвіллі спрямовані на задоволення потреб людини у вільному виборі видів такої діяльності, активному відпочинку, прагненні до фізичного вдосконалення та зміцнення власного здоров'я, пошуку середовища для спілкування. Встановлено, що для підтримки та зміцнення здоров'я студентів у режимі дня доцільно використовувати різноманітні форми фізичної активності, а саме: ранкову гігієнічну гімнастику, спортивно-оздоровчі заходи, активний відпочинок на свіжому повітрі, дихальні вправи, вправи на розвиток м'язів ніг, тулуба й рук. Під час активного дозвілля в молоді реалізуються здебільшого біологічні потреби в руховій активності, здоровому способі життя, отриманні задоволення від занять різними формами фізичної культури. Отже, використання варіативних форм активного дозвілля, збалансованість фізичних навантажень та активного відпочинку в умовах високогір'я дали можливість встановити покращення функціонального стану організму студентів.

Ключові слова: *фізичне навантаження, функціональний стан, природні чинники, студенти, мотивація.*

Сучасна Україна з кожним роком потребує збільшення кількості висококваліфікованих фахівців, які для подальшої успішної праці повинні мати, крім професійних знань, достатній рівень здоров'я та фізичної підготовленості. А це своєю чергою вимагає пошуку нових форм і методів оздоровлення молоді під час навчання студентів у закладах вищої освіти [2, с. 88–90].