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The structural-content model of forming the soft skills of future specialists

One of the main priorities of the country's educational policy, along with increasing the availability of high-quality vocational education that meets the requirements of innovative economic development and the needs of society and its members, is the formation of a system of skills that ensure the free integration of future specialists into the world labor market. Future specialists should be ready to adapt to the rapidly changing conditions of international competition, constantly improve their professional level, constantly develop the ability to work effectively in their specialty, form a professional career. In particular, the issue of improving the quality and effectiveness of training specialists in information and communication technologies is of particular relevance. In this regard, in this article, based on the methodology of scientific research, a systematic activity approach, a meaningful approach, and an axiological approach are chosen as approaches to the study of the formation of soft skills of future information and communication technology (ICT) specialists. The results of fundamental research conducted in the countries of the far and near abroad on the training of ICT specialists and the formation of soft skills for the development of a model for the formation of soft skills of future ICT specialists are analyzed. In addition, the article highlights the interrelated components that ensure the holistic and systematic functioning of the structural and content model for the formation of soft skills of future ICT specialists: 1) purpose; 2) content; 3) technology; 4) result, 5) reflexive. It is important to constantly increase your professional interest, desire for achievements, professional level, improve decision-making skills in the face of changing uncertainty, forming soft skills of future ICT specialists.

Keywords: higher education, information technology, information and communication technologies, future ICT specialist, skills, soft skills, model, modeling, pedagogical modeling.

Introduction

Scientific research in the direction of forming soft skills of future ICT specialists is distinguished by the unique complexity and compatibility of its implementation strategies. Whereas, supplementing evidence-based innovative facts is important for the development of science. The scientific and methodological bases of the research related to the field should be developed in order to constitute the mentioned facts. Therefore, one of the important tasks in the organization of scientific research for the formation of soft skills of future ICT specialists is the classification and selection of methodological foundations. The selected methodological foundations should be in accordance with the goals and tasks of the research. It is important to create a structural-content model for the formation of soft skills of future ICT specialists through methodological approaches. The basis for creating a structural-content model for the formation of soft skills of future ICT specialists is the model, modeling and pedagogical modeling. Additionally, theoretical and practical research on

the formation of soft skills plays an important role in clarifying the structural components of soft skills development approaches in future specialists.

The purpose of the study is to create a structural-content model for the formation of soft skills of future ICT specialists. To achieve the goal of the study, the following tasks were set: - review of the meaning and content of the concepts of research methodology and approaches, determination of methodological approaches to the study of the formation of soft skills of future ICT specialists; - implementation of pedagogical modeling to create a structural-content model of formation of soft skills of ICT specialists, identification of components of the structural-content model and justification of their interrelation.

Materials and methods

In this study, the following research methods were used: - theoretical methods: methods of analysis, systematization and generalization of foreign and domestic scientific-pedagogical literature, dissertation and monographic research materials, results of experiments were used to study the problem of formation of soft skills of future ICT specialists. Pedagogical modeling method was used to create a structural-content model for the formation of soft skills of future ICT specialists. The ICT sector is becoming one of the main factors in the development of the digital economy. ICT and information infrastructure contribute to the creation of new business models, goods and services, new discoveries and inventions, and are the scientific and technological key to the radical transformation of the organization of business models, indirectly increasing the overall competitiveness of the economy as a whole [1].

Constant development of hardware and software requires ICT professionals to adapt quickly to such changes. In the condition of such a rapid changing environment, they should not only acquire specific knowledge and skills in the field of information technologies, but also learn new methods of learning, and conducting an independent research in the field. This is because ICT specialists play an important role in the creation, training, distribution and application of information, as well as in solving technological problems within the organization [2].

A specialist in the field of information technologies who has been well-trained must solve the following types of professional tasks:

- design-construction;
- design-technological;
- design;
- scientific research;
- analytical [3].

In this regard, formation and development of important professional skills in future ICT specialists plays an important role. In research works in the field, skills are divided into hard and soft skills. Hard skills are technical knowledge gained from any life experience and include formal and informal learning. These skills can be developed through practice, repetition and education. However, skills, commonly referred to as “soft skills”, are also required in order to succeed as a specialist [4]. Soft skills refer to a set of interpersonal skills that enable people to improve their relationships and work performance [5].

Results and discussion

In the current conditions of world development, the complex transformation and integration of information technologies and business takes place. The collaborative interaction between these two fields is deepening, and they are becoming a source of development for each other. The society in the state of Industry 4.0 requires a change in the attitude of the person regarding the goals and objectives of higher professional education. This can be used as a basis for justifying the relevance of training a competitive ICT specialist with developed soft skills in the field of information and communication technologies (ICT), who is capable of developing and implementing start-ups. This is because the future ICT specialist manages complex dynamic systems characterized by the characteristics of human-technology, human-symbol system, and human-human professional groups. In this regard, it is important to implement comprehensive measures to develop the soft skills of future ICT specialists. In this regard, it is important to implement comprehensive measures to develop the soft skills of future ICT specialists.

“Soft skills” refer to interaction, articulation and interpersonal skills and are essential for ICT professionals and for training quality ICT graduates. Soft skills will result in graduates who can demonstrate effective communication skills with clients and colleagues, increasing their future employment opportunities [6].

It was noted in scientific publications that the effectiveness of the work of IT specialists depends on their leadership qualities and creativity [7], will and responsibility [8].

There are 10 soft skills that are most often mentioned in the researches related to the activities of ICT professionals. These are: communication, critical decision making, interpersonal skills, negotiation, problem solving, self-confidence, self-management, teamwork and value ethics [9, 10].

A model of the formation of soft skills of future ICT specialists was created based on the analysis of the aforementioned fundamental research works. The *purpose component* of the model includes a system of goals and objectives for the formation of soft skills of future ICT specialists. In addition, it acts as a factor of content improvement of model components. As a result of creating a structural-content model, we defined the goal of forming soft skills of future ICT specialists (Fig.)

The development of soft skills of future ICT specialists is aimed at implementing the 4th direction of state strategy "Kazakhstan-2050" on modernization of educational methods called "Education and professional training is the main orientation of the modern education system, personnel training and retraining", and "Supporting the Development of Talented Youth" section of the Law of the Republic of Kazakhstan "On State Youth Policy". Moreover, it will help to solve the problem of "... emphasis on the development of universal 21st century skills" such as the ability to think critically, work with large amounts of data, work effectively in a team, and quickly adapt to changes", identified as one of the components of the strategic goal of the Republic of Kazakhstan by 2025.

Structural-content model of formation of soft skills of future ICT specialists: *main goal* – formation of soft skills of future ICT specialists; with the systematic connection of internal components of the model, it works to form soft skills of future ICT specialists. In addition, it will be a tool for organizing practical activities aimed at forming the soft skills of future ICT specialists.

The structural-content model of the formation of soft skills of future ICT specialists is considered as a single system divided into interconnected internal components. Additionally, relying on the theoretical-methodological foundations of the formation of soft skills of future ICT specialists includes the following actions: complementation of the meaning, content of soft skills and their components; effective organization of formation of future soft skills (purpose, content and methods, forms and tools); and determination of criteria, indicators, clarification of the methodologies necessary for the study of level assessment, corrections and partial changes to the content of educational programs.

Interrelated components that ensure the unified and systematic functioning of the structural-content model were determined as follows: 1) purpose; 2) content; 3) technology; 4) results.

The *purpose component* of the model ensures the direction and content of the process of forming soft skills of future ICT specialists, the identification of training technologies, and the establishment of strategic and tactical goals in training for the formation of soft skills. In addition, it indicates the current, intermediate and main goals of the study of the learning process.

The *content component* of the model is the methods, tools and forms of organizing educational activities for the formation of soft skills of future ICT specialists. It includes all the content of the educational process aimed at forming the flexible skills of future ICT specialists: the content of the educational programs of the subjects of the educational programs, the program of the additional course "StartUp Engineering". In relation to our research problem, let's take a closer look at the additional course program "StartUp Engineering".

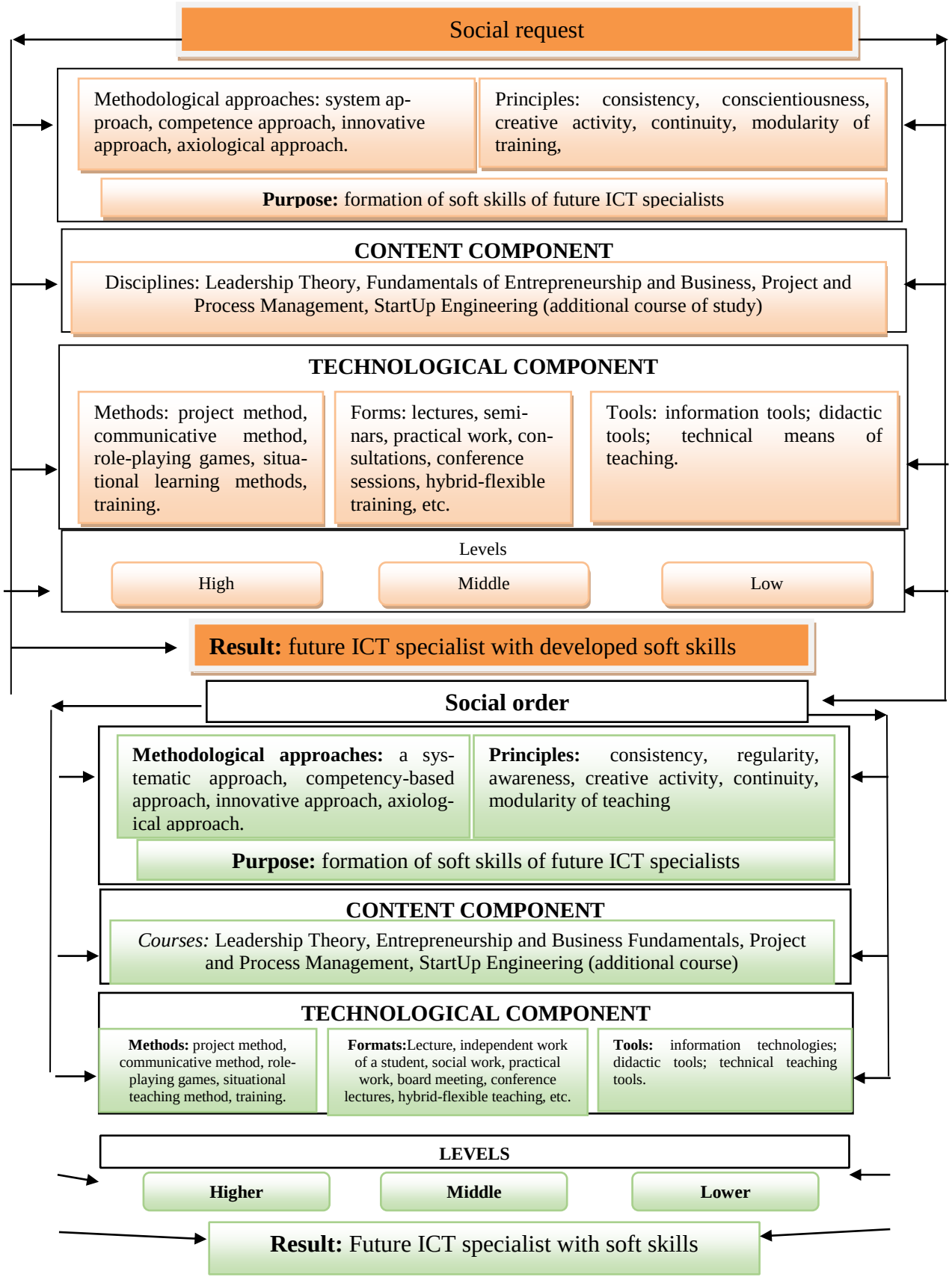

Figure – Structural-content model of formation of soft skills of future ICT specialists

The purpose of the course: Development of soft skills of future information and communication technology specialists. Increasing the number and quality of Kazakhstan startups. To provide an understanding of the process of technological entrepreneurship, to develop teamwork and business skills and flexibility necessary for an IT entrepreneur.

Goals:

- formulation and development of an innovative idea;
- formation of a talented and capable team of Startup;
- development of a strategy, and a reasonable and feasible business plan;
- using all possible ways of raising capital for startup development and scaling;
- conducting startup assessment;
- development of business skills and flexibility necessary for an IT entrepreneur.
- conducting research and polling (testing) of the target audience

Course length: 90 hours (including 15 hours of lectures, 15 hours of practical work, 30 hours of independent work of listener, 30 hours of guided independent work of listener).

Course content

Module I. Introduction to Startup. Business or employment? When to launch your first startup? Identifying your strengths: what will help you succeed?

Module II. Creating an idea. From Dream to Idea: The Walt Disney Method. Elaboration and clarification of ideas. Choosing an idea. Exclusivity of the idea. Description of the business idea. SWOT analysis method.

Module III. The basis of the Startup. Startup partners or own initiative? The need for a partner. Leadership in a Startup. Startup mission. Promotion of project development: long-term planning. Ethics in business. Social responsibility of business.

Module IV. Business model decoration. Study of promising areas of business. Business model canvas. Creating business strategy and competitive advantage. B2B, B2C, B2G sales systems. Business plan: structure. Business plan: presentation formats.

Module V. Product decoration. Product: definition and forms. Buyer's problems with the product. Products that offer innovative solutions. Prototyping: Why Do It?

Module VI. Market research. Main market segments. Segments: best or general. Segment scale: TAM, SAM, SOM. Product demand in the market. Defining the portrait of the buyer. Competitive advantages of the product. Technology as a competitive advantage. Analysis of competitors. Compare your product with a competitor's product.

Module VII. Registration of Startup in Kazakhstan. Pvt or LLP. Taxation systems. License for business activities. Specificity of the legal address. Startup: a guide for beginners. Fundamentals of accounting. Responsibility of entrepreneurs. Intellectual property and its protection.

Module VIII. Promoting a Startup. Logo and corporate style. Website for business. Advertising channels. The basics of online promotion. Social media for business. Basics of SMM.

Module IX. Establishing and scaling a startup in the market. Introduction to the market. Stages of the product life cycle. Product Life Cycle: Growth Stage. Shortening the service life of the product. Sales funnel. Factors to reduce the cost of the product. Digitization of business processes. Expanding the offer through related goods and Services. Coverage of new market segments. Market trends and their impact on sales growth. Customer/buyer loyalty. Business scale. Franchise Basics. Business expansion into new regions/countries. Investments in business. Pitch deck: the basics. Effective Pitch Rules.

The content component of the model is a system of trainings (on the topics of interpersonal communication, time management, leadership, creativity, critical thinking, empathic culture, emotional intelligence) that will enable the formation of soft skills in future ICT specialists.

Technological component of the model – synthesis of methods, tools and forms of educational work organization for formation of flexible skills of learners. It is aimed at forming a system of professional knowledge about the mechanisms of implementation of startups and soft skills in future ICT specialists by updating the existing knowledge. Of course, future ICT professionals have different levels of soft skills. The activity of the technological component consists of training sessions that consolidate theoretically acquired knowledge and improve soft skills through the implementation of educational technologies. Educational technologies include educational information technologies, Internet resources for feedback in educational activities; groupworks, contact hours with the teacher, etc.

The result component – the results of the professional activities in solving the task defined in the formation of soft skills of future ICT specialists, training in terms of soft skills, mastering the components of soft skills. This component includes methods for diagnosing the level of soft skills proficiency of future ICT specialists. High result of the soft skills proficiency of future ICT specialists means achieving a higher level in their professional training. In addition, the results component shows the effectiveness of the designed model and contains the criteria and levels of soft skills formation of future ICT specialists, as well as the expected results. The result component of the model performs the monitoring, analysis, complex correction function of the feedback and allows to analyze information about the progress of training, to correct the methodology of formation of soft skills.

Conclusion

The structural-content model of the formation of soft skills of future ICT specialists offered by us is characterized by the following: integrity, all components are interconnected, contain a certain semantic load, work towards the final result which is to achieve a high level of formation of soft skills of future ICT specialists. All established components of the model, their content and procedural content are interrelated, forming a whole pedagogical system aimed at solving the tasks set in the research. On the basis of the above, the formation of soft skills of future ICT specialists will increase their interest in professional activity, their desire for continuous self-improvement, professional training and the desire to make quick and correct decisions in conditions of changing uncertainty, the built-in skills of specialists who can quickly adapt to the conditions of various characteristics of professional activity.

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Болашақ мамандардың икемді дағдыларын қалыптастырудың құрылымдық-мазмұндық моделі

Еліміздің білім беру саясатының негізгі басымдықтарының бірі ретінде экономиканың инновациялық даму талаптары мен қоғамның және оның мүшелерінің қажеттіліктеріне сәйкес келетін сапалы кәсіби білімнің қолжетімділігін арттырумен қатар, болашақ мамандардың әлемдік еңбек нарығына еркін кірігуін қамтамасыз ететін дағдылар жүйесін қалыптастыру. Болашақ мамандар халықаралық бәсекелестіктің тез өзгеретін жағдайларына бейімделуге, өзінің кәсіби деңгейін ұдайы жетілдіруге, мамандығы бойынша тиімді жұмыс істеу қабілетін тұрақты дамытуға, кәсіби мансабын қалыптастыруға дайын болуы тиіс. Осыған байланысты, осы мақалада ғылыми зерттеулердің әдіснамасы негізінде болашақ ақпараттық-коммуникациялық технологиялар (АКТ) мамандарының икемді дағдыларын қалыптастыруды зерттеу тәсілдері ретінде жүйелі іс-әрекеттік тәсіл, мазмұнды тәсіл, аксиологиялық тәсіл таңдалды. Болашақ АКТ мамандарының икемді дағдыларын қалыптастырудың моделін әзірлеу, зерттеу үшін АКТ мамандарын даярлау және икемді дағдыларды қалыптастыру бойынша алыс-жақын шетелдерде жүргізілген іргелі зерттеу жұмыстарының нәтижелері талданған. Сонымен қатар, мақалада модель, модельдеу, педагогикалық моделдеу ұғымдары негізінде болашақ АКТ мамандарының икемді дағдыларын қалыптастырудың құрылымдық мазмұндық моделінің біртұтас әрі жүйелі жұмыс істеуін қамтамасыз ететін өзара байланысты компоненттері анықталған: 1) мақсаттық; 2) мазмұндық; 3) технологиялық; 4) нәтижелік, 5) рефлексивтік. Болашақ АКТ мамандарының икемді дағдыларын қалыптастыру арқылы олардың кәсіби қызығушылығын, кәсіби өсу мен жетістіктерге ұдайы ұмтылысын арттыруға, кәсіби деңгейін үздіксіз жетілдіруге, өзгермелі белгісіздік жағдайларында шешім қабылдау дағдыларын жетілдіру маңызды.

Кілт сөздер: жоғары білім, ақпараттық технологиялар, ақпараттық-коммуникациялық технологиялар, болашақ АКТ маманы, дағдылар, икемді дағдылар, модель, модельдеу, педагогикалық модельдеу.

Н.İ.Bülbül, М.С.Бекболат, К.М.Беркимбаев*, Г.П.Мейрбекова

Модель формирования гибких навыков у будущих специалистов

Одним из основных приоритетов образовательной политики страны, наряду с повышением доступности качественного профессионального образования, соответствующего требованиям инновационного развития экономики и потребностям общества и его членов, является формирование системы навыков, обеспечивающих свободную интеграцию будущих специалистов на мировой рынок труда. Будущие специалисты должны быть готовы адаптироваться к быстро меняющимся условиям международной конкуренции, постоянно совершенствовать свой профессиональный уровень и развивать способность эффективно работать по специальности, формировать профессиональную карьеру. В частности, особую актуальность приобретает вопрос повышения качества и эффективности подготовки специалистов информационно-коммуникационных технологий. В этой связи в данной статье на основе методологии научных исследований выбран системный деятельностный подход, содержательный подход, аксиологический подход как подходы к изучению формирования гибких навыков будущих специалистов информационно-коммуникационных технологий (ИКТ). Проанализированы результаты фундаментальных исследовательских работ, проведенных в странах дальнего и ближнего зарубежья по подготовке специалистов ИКТ и формированию гибких навыков для разработки модели формирования гибких навыков будущих специалистов ИКТ. Кроме того, в статье определены взаимосвязанные компоненты, обеспечивающие целостное и системное функционирование структурной содержательной модели формирования гибких навыков будущих специалистов ИКТ на основе понятий «модель», «моделирование», «педагогическое моделирование»: 1) целевое; 2) содержательное; 3) технологическое; 4) результативное, 5) рефлексивное. Важно постоянно совершенствовать свой профессиональный интерес, стремление к достижениям, профессиональный уровень, совершенствовать навыки принятия решений в условиях меняющейся неопределенности, формируя гибкие навыки будущих специалистов ИКТ.

Ключевые слова: высшее образование, информационные технологии, информационно-коммуникационные технологии, будущий специалист ИКТ, навыки, гибкие навыки, модель, моделирование, педагогическое моделирование.

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