






Innovative technologies of vocational guidance work in higher medical educational institutions (Ukrainian and foreign experience)

Tecnologias inovadoras de orientação vocacional trabalho em instituições de ensino médico superior (experiência ucraniana e estrangeira)

Tecnologías innovadoras de la labor de orientación profesional en los centros de enseñanza médica superior (experiencia ucraniana y extranjera)

Budko Hanna Yuriyevna¹ , Ivakhniuk Tatiana² , Kiptenko Ludmyla³ ,
Hrebenyk Liudmyla⁴ , Karpenko Lyudmila Ivanovna¹ 

¹ Department of Pathology, Sumy State University, Medical Institute Rimsky-Korsakov, Sumy, Ukraine.

² Department of Huge Health, Medical Institute of Sumy State University, Sumy, Ukraine.

³ Department of Morphology, Medical Institute of Sumy State University, Sumy, Ukraine.

⁴ Department of Biophysics, Biochemistry, Pharmacology and Biomolecular Engineering, Medical Institute of Sumy State University, Sumy, Ukraine.

Corresponding author:

Budko Hanna Yuriyevna

Email: 1233566789b@gmail.com

How to cite: Yuriyevna, B. H., Tatiana, I., Ludmyla, K., Liudmyla, H., & Ivanovna, K. L. (2022). Innovative technologies of vocational guidance work in higher medical educational institutions (Ukrainian and foreign experience). *Revista Tempos e Espaços em Educação*, 15(34), e16901. <http://dx.doi.org/10.20952/revtee.v15i34.16901>

ABSTRACT

The article highlights the experience of the organization of career guidance in Ukrainian and foreign medical institutions of higher education. Today dictates new realities for campaigning for attracting applicants to the medical profession and the choice of further specialization by medical students. Globalization and informatization offer new opportunities for universities to advertise their educational services. Among the main innovative technologies of career guidance, we note the following artificial intelligence algorithms, creation of a new type of informational content involving new information technologies and communications, active maintenance of pages in social networks, media advertising, targeted advertising, direct communication with mentors and administrators. The COVID-19 pandemic has made its adjustments, increasing the share of Internet resources as a format for career guidance both externally (schools, colleges) and internally (university departments and hospitals where they take internships). The article provides a comparative analysis and dynamics of the number of students over the past three years in different

universities of Ukraine and different specialties. The aim of the work is to analyze the effectiveness of career guidance, taking into account the involvement of innovative technologies and predicting promising clusters of agitation in the medical university and students' choice of a particular specialty in the health care system. Active maintenance of popular among young people pages of medical specialties (medicine, medical psychology, dentistry) contributes to improved communication at the levels: applicant-university, student-university, master (bachelor) - employer. Information technology makes it possible to promptly deliver to applicants for higher education relevant information on the provisions of the admission campaign, the organization of the educational process and traditions of the university, the peculiarities of further employment. Also, the intelligence demonstrates the difference in approaches to the organization of the agitation cluster in Ukrainian universities and foreign universities.

Keywords: Advertising. Educational services. Higher medical education. Information technology. Vocational guidance.

RESUMO

O artigo destaca a experiência da organização de orientação profissional em instituições médicas ucranianas e estrangeiras de ensino superior. Hoje dita novas realidades para a campanha de atracção de candidatos à profissão médica e a escolha de uma maior especialização por parte dos estudantes de medicina. A globalização e a informatização oferecem novas oportunidades para as universidades publicitarem os seus serviços educativos. Entre as principais tecnologias inovadoras de orientação profissional, destacam-se os seguintes algoritmos de inteligência artificial, criação de um novo tipo de conteúdo informativo envolvendo novas tecnologias de informação e comunicação, manutenção activa de páginas em redes sociais, publicidade nos media, publicidade direccionada, comunicação directa com mentores e administradores. A pandemia COVID-19 fez os seus ajustamentos, aumentando a quota de recursos da Internet como formato de orientação profissional tanto externa (escolas, faculdades) como interna (departamentos universitários e hospitais onde fazem estágios). O artigo fornece uma análise comparativa e dinâmica do número de estudantes durante os últimos três anos em diferentes universidades da Ucrânia e em diferentes especialidades. O objectivo do trabalho é analisar a eficácia da orientação profissional, tendo em conta o envolvimento de tecnologias inovadoras e a previsão de grupos promissores de agitação na universidade de medicina e a escolha dos estudantes de uma especialidade específica no sistema de saúde. A manutenção activa de páginas populares entre os jovens de especialidades médicas (medicina, psicologia médica, odontologia) contribui para uma melhor comunicação aos níveis: aplicante-universidade, estudante-universidade, mestre (bacharelato) - empregador. As tecnologias da informação permitem fornecer prontamente aos candidatos ao ensino superior informações relevantes sobre as disposições da campanha de admissão, a organização do processo educativo e as tradições da universidade, as peculiaridades do emprego posterior. Além disso, a inteligência demonstra a diferença nas abordagens à organização do cluster de agitação nas universidades ucranianas e nas universidades estrangeiras.

Palavras-chave: Ensino médico superior. Orientação vocacional. Publicidade. Serviços educativos. Tecnologia da informação.

RESUMEN

El artículo destaca la experiencia de la organización de la orientación profesional en las instituciones médicas de enseñanza superior ucranianas y extranjeras. Hoy en día, la campaña para atraer a los aspirantes a la profesión médica y la elección de una mayor especialización por parte de los estudiantes de medicina presenta nuevas realidades. La globalización y la informatización ofrecen nuevas oportunidades a las universidades para publicitar sus servicios educativos. Entre las principales tecnologías innovadoras de la orientación profesional, destacan los algoritmos de

inteligencia artificial, la creación de un nuevo tipo de contenido informativo que implica nuevas tecnologías de la información y la comunicación, el mantenimiento activo de páginas en las redes sociales, la publicidad en los medios de comunicación, la publicidad dirigida, la comunicación directa con los tutores y los administradores. La pandemia de la COVID-19 ha hecho sus ajustes, aumentando la participación de los recursos de Internet como formato de orientación profesional tanto a nivel externo (escuelas, colegios) como interno (departamentos universitarios y hospitales donde se realizan las prácticas). El artículo ofrece un análisis comparativo y la dinámica del número de estudiantes en los últimos tres años en diferentes universidades de Ucrania y diferentes especialidades. El objetivo del trabajo es analizar la eficacia de la orientación profesional, teniendo en cuenta la participación de las tecnologías innovadoras y la predicción de los grupos prometedores de agitación en la universidad de medicina y la elección de los estudiantes de una determinada especialidad en el sistema sanitario. El mantenimiento activo de las páginas de popularidad entre los jóvenes de las especialidades médicas (medicina, psicología médica, odontología) contribuye a mejorar la comunicación en los niveles: solicitante-universidad, estudiante-universidad, maestro (licenciado) - empleador. La tecnología de la información permite entregar rápidamente a los solicitantes de educación superior información relevante sobre las disposiciones de la campaña de admisión, la organización del proceso educativo y las tradiciones de la universidad, las peculiaridades del empleo posterior. Además, la inteligencia demuestra la diferencia de enfoques en la organización del grupo de agitación en las universidades ucranianas y las universidades extranjeras.

Palabras clave: Enseñanza médica superior. Orientación profesional. Publicidad. Servicios educativos. Tecnología de la información.

INTRODUCTION

Vocational guidance in Ukraine is a relatively new phenomenon since there is no long-term tradition of market economy development. The 80s of the twentieth century were marked by the command-administrative structure of the economy and, as a consequence, education, including the recruitment of students in certain specialties and the distribution of graduates to the first jobs, was also completely subject to the planned settings (clearly painted and binding.) The 1990s were characterized by socio-economic instability, so there was no point in talking about the effectiveness or even relevance of campaigning for university enrollment, either. A similar difficulty manifested itself with employment. Since the beginning of the XXI century there has been a stabilization in higher education. Higher education institutions began to work out strategic development plans, which were supposed to attract a constant number of education applicants.

However, at that time higher education in Ukraine faced a demographic factor, which caused significant problems with potential applicants and, accordingly, a decrease in student enrollment. This state of affairs was also typical for medical universities, especially for classical specialties: "Medicine", "Pediatrics", "Dentistry", "Pharmacy, Industrial Pharmacy". The decrease in the number of applicants was caused by several social factors:

- decrease in the birth rate in the state as a whole; and decrease in school and college graduates;
- outflow of Ukrainian applicants for training in foreign universities;
- economic factors (increased fees for medical specialties);
- certain reorientation of applicants in traditional professions (doctor, teacher) to modern creative and technological specialties.

All these factors led to an urgent need for a broad and targeted campaign to attract applicants to medical schools. Vocational guidance work has become a relevant and demanded phenomenon in higher education institutions.

A separate cluster of career guidance activities for Ukrainian medical institutions of higher education has become the attraction of foreign citizens to study. Ukrainian medical universities are especially popular with applicants from Asia and Africa. However, the modern educational process in the global dimension is a dynamic process, so the reorientation of these students to medical educational institutions in other countries is possible. Therefore, an active propaganda campaign is now unfolding in the territories of Asian and African states to popularize Ukrainian medical universities. Most of this work is done through the use of remote innovative technologies: marketing programs and informational content.

A completely different situation is observed in Western universities, where the concept of career guidance is as familiar as academic or research work. Local institutions of higher education have separate departments dedicated to conducting a propaganda cluster that ensures the university's recognition in the country and abroad. In addition, physician-mentors are peculiar organizers of the career guidance cluster (Dolfini, 2020).

Hundreds of universities are purchasing algorithms that use artificial intelligence to conduct career guidance work. We are talking about the distribution of the scholarship fund, forms of education (Engler, 2021). Now we observe a picture, according to which artificial intelligence is becoming an active player in the field of higher education market competition.

Megatrends of innovative methods of career guidance in education are: the use of ICT, the development of CMS, personal cooperation, the role of the family). These innovations should be considered in a regional or national context, as career guidance systems have different traditions and challenges and are at different stages of development. Examples of innovative career guidance cover the entire spectrum of lifelong learning and all types of stakeholders (International trends and innovation in career guidance, 2020).

LITERATURE REVIEW

The issues of innovative technologies of vocational guidance work in educational institutions are actively covered in the works of domestic and foreign scientists. Since we are talking about the latest elements of technologies and tools, the work of the last 5 years is relevant. Works published earlier important and informative but have lost their relevance to the coverage of this topic because of the rapid scientific and technological progress and the introduction of qualitatively new innovative components.

Fundamental works, considering universal aspects of the use of new precepts in the conduct of career guidance in the educational cluster, are formed (International trends and innovation in career guidance, 2020; Athanasou & Perera, 2018).

The general features of innovation in the career guidance work of foreign universities are highlighted by Dodd et al. (2020), Keshf et al. (2021), Launikari et al. (2020). The regional and national aspects of the higher education cluster can be found in the works of South Korean researchers Ock et al. (2020), German scientists Fitzenberger (2019), American scientist Hyman (2020). Ukrainian studies of this problem are concentrated in the works of Tsekhmister et al. (2021), Cherusheva & Syniakov (2020).

Vocational guidance work in the innovative dimension in the institutions of higher medical education is reflected in Dolfini (2020), Engler (2021), Gennissen et al. (2021).

METHODOLOGY

The article uses general scientific and philosophical research methods. The culturological method gives a general characteristic of innovative technologies in the modern socio-cultural space and the work of the vocational guidance cluster of the higher medical school. Thanks to the comparative analysis two results are achieved: 1) the difference between the propaganda career

guidance for applicants and for students of higher medical institutions is indicated; 2) the differences in the organization of career guidance in domestic and foreign medical universities are determined. Synergetic scientific-philosophical methodology provides an opportunity to investigate the problem of innovative technologies in vocational guidance work objectively and axiologically, studying both its short-term aspects and strategic prospects of development.

RESULTS

One of the aspects of career guidance work in higher medical education is a campaign for applicants. In Ukraine this cluster is developing quite rapidly, as medical universities faced an acute problem of lack of sufficient number of those willing to obtain a specialty related to the direction of health care. Institutions of higher medical education, being in conditions of fierce competition, apply all possible elements to encourage applicants. First and foremost, it is about innovative technologies. The times when applicants found the necessary information about the university on their own are a thing of the past. Now it is vital for the university to bring all the information to the future applicant for the medical profession. The COVID-19 pandemic has made these processes even more difficult, leaving almost no opportunity for live communication. Most information is broadcast through the media and Internet resources. It is necessary not only to broadcast the information, but also to find the target audience. Modern methods of artificial intelligence and marketing services cope with this perfectly. Targeted advertising, SMM content allow for quality communication with the offers offered by the institution of higher education.

Medical institutions of higher education have successfully used elements of computer-based education in the absence of opportunities to present the necessary material as performed by a preceptor (Fallavollita, 2017). E-learning is relevant both for applicants who are offered a new model of education and for students who can evaluate the effectiveness of this format in real time. Computer visualization, database modeling, electronic knowledge testing tools, personalized courses, and individualized learning strategies are all incomplete lists of the most common innovations in medical training. With the active introduction of new technologies, career guidance automatically involves these components in its arsenal.

The format of career guidance as a long-term career strategy is relevant. Maree (2020) considers the connection between successive waves of career counseling as psychological aspects, the globalization of the economy, and the revolutionary nature of technology. Each such wave is characterized by distinctive features and characteristics. The process of career strategy intervention is a result-oriented business model - the realization of professional formation and growth. In fact, the "struggle for a specialist" begins long before the applicant chooses his or her future profession. At the subconscious level there is a brainstorming process that advertises this or that specialty, giving it significance and importance.

The realities of today shape the career guidance work in the context of the competition of universities and their struggle for applicants. Although the purpose of this work is to identify and purposefully develop the talents and abilities of young people, taking into account their professional and cognitive interests in the choice of future specialty (Cherusheva & Syniakov, 2020).

Guidance works within a tradition of concern for the well-being and dignity of the individual (Athanasou & Perera, 2018). This is why legal and ethical standards must be respected when introducing new technologies of an innovative nature. It is no secret that today there are many types of advertising that influence human consciousness. In this context, we consider the use of such technologies in informational content of career guidance is unacceptable. Respect for the dignity of a person's beliefs should always be an axiom and not become a field for any manipulative actions.

Professional competence, on which career guidance is based, according to the ideas (Tsekhmister & Lysenko, 2018) should include the following aspects:

- motivational and axiological - the formation of well-established goal settings that stimulate learning, education, self-development and self-improvement;
- cognitive - basic system of knowledge of the fundamentals of the health care system, obtained from proven and reliable sources of information;
- socio-personal - improvement of non-linear thinking and ability to non-standard but effective solutions in professional activity;
- professional-activity - transformation of all obtained knowledge into an arsenal of professional training to implement a successful career.

There is a clear connection between the level of applicant's participation in career guidance and the readiness of the school student for a career. This connection can be seen both in those cases where individuals are interested in receiving information about the university, profession, training conditions, etc. (Dodd, Hanson & Hooley, 2020).

A group of researchers (Fitzenberger, Hillerich-Sigg & Sprietsma, 2019) compared career guidance in the United States and Europe. Specifically, the U.S. education model is characterized by a focus on encouraging applicants to attend college and helping with organizational issues (preparing admissions documents, dealing with welfare issues, tuition, and scholarship fund). The European model is more focused on offering a choice between the classical academic direction of higher education and professional direction. At the same time, for example, in Germany, which is considered a model of organizational work, the propaganda campaign is aimed at teenagers 15-16 years old. Such a model of career guidance work has an exclusively short-term goal - to help a young person make a choice of format and place of study. As for the long-term prospects through the formation of professional skills and future employment, the effect of the mentioned agitation is insignificant.

A group of researchers (Gurantz et al., 2020) conducted research on the effectiveness of using distance communication technology - virtual communication. The results demonstrated an increase in college enrollment. This model allows an efficient use of time without wasting it on the organizational preparation of meetings in a classroom format. All the necessary information is received by those interested.

An interesting experiment was conducted by Hyman (2020) in Michigan, USA. The Department of Education there sent more than 50,000 letters of invitation to colleges (including medical schools). A large percentage of those interested in such offers are children from poor families.

In Ukraine, the state has preferential admission terms for applicants who are orphans or children of combat veterans. In the informational content of career guidance such aspects should also be indicated to ensure the possibility of higher education for all segments of the population.

In order to provide an adequate recommendation for applicants, guidance counselors must conceptualize issues and identify student career prospects from an experience perspective (Suryadi, Ratna Sawitri & Hanifa, 2018).

Researchers use Q-methodology, a hybrid qualitative-quantitative method by which career orientations of medical students are investigated. A study conducted in the Netherlands (Gennissen et al., 2021) identified three key future career planning tendencies:

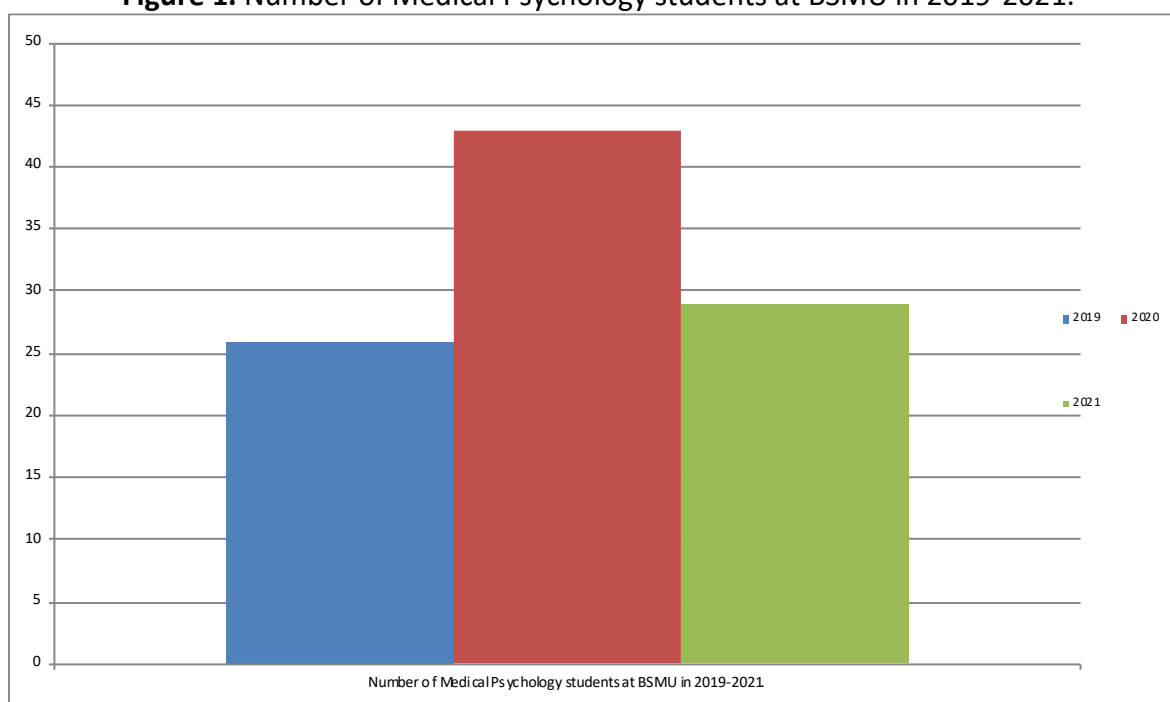
- emphasis on self-organization and self-development;
- the value of a balance between professional and personal life;
- the need for recognition of one's work.

We analyzed the quantitative indicators of student enrollment in different specialties in the field of knowledge: "Healthcare" in different medical universities of Ukraine. At the same time, we paid attention to the dynamics and diversity of the application of career guidance.

In particular, at the Bukovinian State Medical University, the specialty "Medical Psychology" shows stable indicators in terms of the number of students who have chosen this specialty. Having

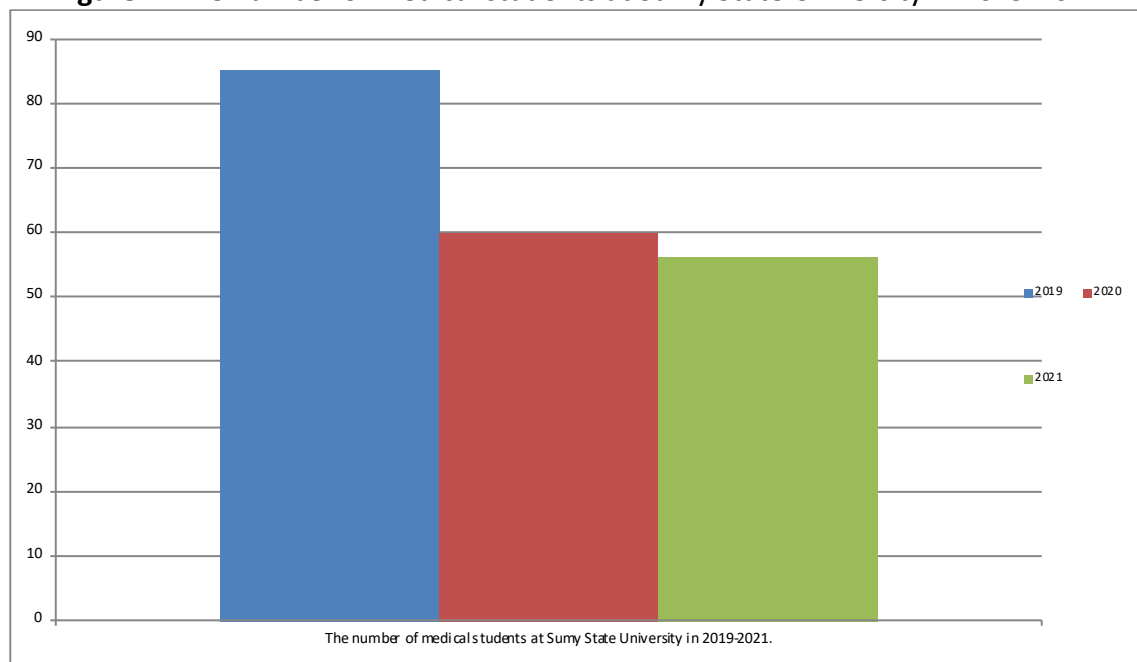
analyzed the reports on the career guidance work done, we note that the growth in the number of psychology students began with the time of active implementation of innovative information technologies and communications. Note that until 2019, the specialty “Medical Psychology” had no demand from applicants and from 2016 to 2018 enrollment in this specialty did not yield any results. The situation has changed dramatically since the use of media and Internet resources in career guidance work. In particular, at the Bukovinian State Medical University, the specialty “Medical Psychology” shows stable indicators for the number of students who have chosen this specialty. Having analyzed the reports on the career guidance work done, we note that the growth in the number of psychology students began with the time of the active implementation of innovative information technologies and communications. Note that until 2019, the specialty “Medical Psychology” had no demand from applicants and from 2016 to 2018 enrollment in this specialty did not yield any results. The situation has changed dramatically since the use of media and INTERNET resources in career guidance work (Figure 1).

Figure 1. Number of Medical Psychology students at BSMU in 2019-2021.



Dozens of articles about the specialty of medical psychologist in the media, active maintenance of pages of specialty “Medical Psychology” at BSMU provided a stable indicator of students who chose the university for medical and psychological education. As for the prospects of further career guidance work, we are talking about the application of targeted advertising designed to increase the target audience to whom educational and informational content is offered.

At the Medical Institute of Sumy State University, the dynamics of applicants who have chosen the specialty “Medicine” is constant with some tendencies to decrease. This indicates the effectiveness of the work done with the applicants. However, it should be noted the need to introduce innovative technologies to improve the effectiveness of the work carried out and increase the number of students in subsequent years (Figure 2).

Figure 2. The number of medical students at Sumy State University in 2019-2021.

The influence of information technology is now expanding. This process also applies to the pharmaceutical sector (Tsekhmister et al., 2021), which is facing new opportunities for better quality of care. Consequently, career guidance for applicants who plan to choose a pharmacy profession has also begun to intensify in the future. The pharmaceutical health care sector is moving into the era of e-health, leading to its informatization.

The use of information technology and communications is widespread in the career guidance cluster. First and foremost is the increase in pathways for higher education information as well as the use of information technology and communications as a referral service (Supriyanto et al., 2019).

Always relevant in the career guidance work of Ukrainian medical universities was the holding of open days. These are peculiar excursions to familiarize applicants with the key aspects of university life. With the spread of the COVID-19 pandemic, holding such events has become problematic. Therefore, the format was changed to a virtual excursion tour with appropriate information support.

Vocational guidance at the university should not end with the student's enrollment. Guidelines for further employment or professional development start from the first day of the student's studies, thus motivating him and preparing him for the realities of the medical field. In particular, Keshf & Khanum (2021) proposed a set of career guidance questionnaires for first-year students in Pakistan. Among these questions, we note two key items:

- Do you need any help or guidance now or in the future regarding your career?
- Do your current or future career goals match your skills, abilities and interests?

Such surveys make it possible to answer the question about the result of the career guidance work for the applicant (not the actual obtaining of student status, but the semantic understanding of the future profession). In addition, the student has the opportunity to assess his or her potential and prospects for further education and work. This is especially important for students of medical specialties, who, after receiving their master's qualification, must undergo another educational stage - internship or residency. Of course, the university is interested in having students stay at the same institution of higher education for advanced training after the 6-year cycle of medical training.

The greatest interest among medical students is information about the specialty to choose for residency, the hospital where the internship will take place, the professional direction of

physician practice, etc. To these questions, according to Ock et al., (2020), students need a qualified answer, which should be provided by the professionals in charge of career guidance for students and those upgrading/changing their qualifications at the university.

A relevant element of innovative technology in career guidance in medical universities is the concept of knowledge management (Karamitri, Talias & Bellali, 2017). This model is relevant for both types of career guidance we investigate. At the stage of admission to medical school, the applicant should be guided to actualize those disciplines that are necessary for admission to a medical institution of higher education. Successful passing of external independent evaluation (IEE) in Ukrainian language (as a basic discipline) and special subjects (chemistry, biology, mathematics) ensures admission and further medical specialization. Knowledge management in this aspect implies an emphasis in the career guidance work on the study of those school subjects, which are necessary for admission to the university. In the learning process, the student also regulates the process of knowledge management with the help of tutors. This is realized in the student's choice of appropriate qualifications and a set of disciplines that allow the formation of the necessary knowledge, skills and abilities.

In the Western medical education cluster, the trend toward the need for professional counseling for young people is spreading (Maree, 2021). This element has only strengthened its position with the spread of the Covid-19 pandemic. Innovative and professionally directed career counseling is the best way to communicate the benefits of obtaining a major from a particular area of social activity. Such practice relies on the formation of conceptual life positions based on the construction of one's own future (in our case - career planning). Guidance counseling provides a necessary adaptation element to start the process of professional self-identification of a person. The main leitmotif of counseling is not the imposition of the advantages of the medical profession (like any other), but the prospects of self-building a career. Counseling by electronic means ensures the continuity of career guidance, despite external factors. In this way, interested individuals are provided with the necessary information to develop their own strategy for choosing and mastering a profession.

The period of industrialization in the Western world is characterized by the creation of transnational companies, in particular the medical and pharmaceutical cluster. A new reality in the issue of staffing is being formed (Van Esbroeck, 2018). Accordingly, career guidance work is carried out taking into account the proposals in the labor market. Western medical and pharmaceutical universities have already passed the stage of transformation of their curricula, ensuring the continuity of improvement or change of qualifications in accordance with short-term prospects in the market. Ukrainian higher medical education institutions operate according to a linear scheme of training medical specialists. Accordingly, career guidance work for medical university students does not provide dynamics, forming in them a traditional understanding of their specialty and the specialty they have chosen.

Innovative technologies allow the formation of qualitatively new information content on the popularization of obtaining a medical profession. This will contribute to the short-term enrollment of applicants to medical university. We are talking about a strategic goal - formation of awareness of the benefits of career prospects in the medical field. Such guidance will make it possible in the future not to depend on demographic or socio-economic factors that hinder the development of the medical industry as a whole. Obtaining a physician's specialty should be an important cluster of the state's harmonious health care system.

DISCUSSION

Consider the notion of career guidance mobility (Launikari et al., 2020), which involves providing stakeholders with information and advice about the educational process, despite any

factors that potentially hinder it. Representatives of the Gatsby Foundation (Holman, 2021) point out that quality career guidance is necessary for social mobility. Gatsby's specific precepts for career guidance have now been formed, among which can be noted such components as: informativeness, communicativeness, individual approach, synergistic model of connection between learning and work, experience.

Consequently, the use of innovative technologies in conducting career guidance work provides a key factor - the availability of information about professional training at the university at all levels. The creation of information content that can be delivered to the interested parties without any obstacles, turns innovative technologies into an effective cluster of career guidance. Social networks, targeted advertising, interpersonal communication between student and mentor online allows for constant contact and interaction between stakeholders. The promise of information technologies and marketing elements is obvious and requires further scientific study and feasibility justification of use in institutions of higher medical education.

The format of career guidance remains a matter of debate. In Western countries there has been a transition to career guidance counseling based on the principles of:

- effectiveness of cooperation (mutual interest in the end - the choice of profession);
- trust in the mentor (consultant);
- encouragement of self-organization (long-term strategic career planning);
- use of information computer technology;
- involvement of marketing software offers.

In developing countries, including Ukraine, the acute demographic crisis and socio-economic factors have led to fierce competition between medical universities for applicants for medical specialties or qualifications and have led to the dominance of another format of career guidance, the campaign model. This short-term strategy allows the enrollment of students for training, however, the ability to plan long-term projects for the development of higher medical education, is rapidly decreasing.

The use of innovative technology for students who graduate from high school is justified because the likelihood of entering college or university increases (Kramer, 2020). The realization of this likelihood, however, depends on many factors that have not yet been sufficiently explored, either in the information technology dimension or in the marketing sense. In this case we are talking about a certain inducement to action without a guarantee of the final result. However, the demand for the use of innovative technologies is obvious.

CONCLUSION

Vocational guidance work in Ukraine is a relatively new phenomenon since there are no long traditions of market economy development. There is an urgent need to systematize two fundamental aspects of career guidance work in medical institutions of higher education in Ukraine:

- input career guidance work (attracting applicants to study at the medical university and obtain a specialty related to the health care system);
- exit career guidance (work with students during their studies to identify, based on the analysis of their abilities, the best option for further employment).

Innovative technologies used in career guidance at medical universities can be divided into two main clusters:

- information and technological communications;
- marketing activities;
- philosophical and psychological techniques.

It should be noted that career counseling has now been reoriented from the principles of the propaganda format into advisory models. Such guidance provides not the choice of a medical profession (for the applicant) or a professional medical qualification (for the student), but the

opportunity to plan and implement a career outlook. Developing an individual's strategic vision of long-term career aspects is a more effective tool than short-term career choice decisions. A conscious position on the choice of the future medical profession activates self-organizing components: self-education, self-motivation and self-education, which contributes to successful learning and obtaining the necessary knowledge, skills necessary for the medical field.

The use of innovative technologies in the career guidance work of medical institutions of higher education allows to maintain competitiveness in the market of educational services. Involvement of information and computer technologies performs a communicative function, providing the presentation of necessary information content about the benefits of obtaining a specialty or qualification of a doctor. The introduction of marketing elements allows effective advertising of educational services provided by medical universities. Psychological practices using personal approach and philosophical-synergetic methods of self-organization are important components in career building.

Authors' Contributions: Yurievna, B. H.: conception and design, acquisition of data, analysis and interpretation of data; Tatiana, I.: analysis and interpretation of data, critical review of important intellectual content; Ludmyla, K.: drafting the article; Liudmyla, H.: acquisition of data; Ivanovna, K. L.: analysis and interpretation of data, critical review of important intellectual content. All authors have read and approved the final version of the manuscript.

Ethics Approval: Not applicable.

Acknowledgments: Not applicable.

REFERENCES

- Perera, H. N., & Athanasou, J. A. (2019). Introduction: An international handbook of career guidance. In *International Handbook of Career Guidance* (pp. 1–22). Springer International Publishing. https://doi.org/10.1007/978-3-030-25153-6_1
- Cherusheva, H. B., & Syniakov, A. V. (2020). Vital problems of the career guidance work in higher education establishments: The Socio-economic context. *Statistics of Ukraine*, 89(2–3), 107–116. [https://doi.org/10.31767/su.2-3\(89-90\)2020.02-03.12](https://doi.org/10.31767/su.2-3(89-90)2020.02-03.12)
- Dodd, V., Hanson, J., & Hooley, T. (2021). Increasing students' career readiness through career guidance: measuring the impact with a validated measure. *British Journal of Guidance & Counselling*, 1–13. <https://doi.org/10.1080/03069885.2021.1937515>
- Dolfini, L. (2020). Doctors as mentors: the need for career guidance during medical school. *Postgraduate Medical Journal*, 96(1136), 365. <https://doi.org/10.1136/postgradmedj-2020-137836>
- Engler, A. (2021, September 14). *Enrollment algorithms are contributing to the crises of higher education*. Brookings. <https://www.brookings.edu/research/enrollment-algorithms-are-contributing-to-the-crises-of-higher-education/>
- Fallavollita, P. (2017). Innovative technologies for medical education. In *Human Anatomy - Reviews and Medical Advances*. InTech. <https://doi.org/10.5772/intechopen.68775>
- Fitzenberger, B., Hillerich-Sigg, A., & Sprietsma, M. (2020). Different counselors, many options: Career guidance and career plans in secondary schools. *German Economic Review*, 21(1), 65–106. <https://doi.org/10.1515/ger-2019-0027>
- Gennissen, L., Stegers-Jager, K., van Exel, J., Fluit, L., de Graaf, J., & de Hoog, M. (2021). Career orientations of medical students: A Q-methodology study. *PloS One*, 16(5), e0249092. <https://doi.org/10.1371/journal.pone.0249092>
- Gurantz, O., Pender, M., Mabel, Z., Larson, C., & Bettinger, E. (2020). Virtual advising for high-achieving high school students. *Economics of Education Review*, 75(101974), 101974. <https://doi.org/10.1016/j.econedurev.2020.101974>
- Holman, J. Good career guidance (2021). Org.Uk. Retrieved from: <https://www.gatsby.org.uk/education/focus-areas/good-career-guidance>
- Hyman, J. (2020). Can light-touch college-going interventions make a difference? Evidence from a statewide experiment in Michigan: Can light-touch college-going interventions make a difference? *Journal of Policy Analysis and Management*, 39(1), 159–190. <https://doi.org/10.1002/pam.22155>

International trends and innovation in career guidance – Volume II. Country case studies. (n.d.). Europa.Eu. Retrieved from: <https://www.etf.europa.eu/en/publications-and-resources/publications/international-trends-and-innovation-career-guidance-volume>

Karamitri, I., Talias, M. A., & Bellali, T. (2017). Knowledge management practices in healthcare settings: a systematic review: Knowledge Management in Healthcare: A Systematic Review. *The International Journal of Health Planning and Management*, 32(1), 4–18. <https://doi.org/10.1002/hpm.2303>

Keshf, Z., & Khanum, S. (2021). Career guidance and counseling needs in a developing country's context: A qualitative study. *SAGE Open*, 11(3), 215824402110401. <https://doi.org/10.1177/21582440211040119>

Kramer, J. W. (2020). Experimental evidence on the effects (or lack thereof) of informational framing during the college transition. *AERA Open*, 6(1), 233285842090853. <https://doi.org/10.1177/2332858420908536>

Launikari, M., Ahlroos, N., Hagen, E., & Stefánsdóttir, D. (2020). Developing guidance competences for learning mobility. In *Career and Career Guidance in the Nordic Countries* (pp. 191–205). BRILL. https://doi.org/10.1163/9789004428096_013

Maree, J. G. (2020). How global change necessitates innovation in career counseling: Linking economic, industrial, psychology, and career counseling waves. In *Innovating Counseling for Self- and Career Construction* (pp. 67–84). Springer International Publishing. https://doi.org/10.1007/978-3-030-48648-8_4

Maree, J. G. (2021). Innovating and contextualising career counselling for young people during the Covid-19 pandemic. *Suid-Afrikaanse Tydskrif Vir Sielkunde [South African Journal of Psychology]*, 51(2), 244–255. <https://doi.org/10.1177/0081246321999507>

Ock, M., Han, Y.-J., Choi, E. Y., Pyo, J., & Lee, W. (2020). Perceptions of medical students regarding career counseling in Korea: A qualitative study. *International Journal of Environmental Research and Public Health*, 17(10), 3486. <https://doi.org/10.3390/ijerph17103486>

Supriyanto, G., Widiaty, I., Abdullah, A. G., & Yustiana, Y. R. (2019). Application expert system career guidance for students. *Journal of Physics. Conference Series*, 1402(6), 066031. <https://doi.org/10.1088/1742-6596/1402/6/066031>

Suryadi, B., Ratna Sawitri, D., Hamidah, & Hanifa, F. (2018). Career orientation of senior secondary school students. *SHS Web of Conferences*, 42, 00005. <https://doi.org/10.1051/shsconf/20184200005>

Tsekhmister, Ya., Goncharuk, D., Datsiuk, N., Tsekhmister, B., Lysenko, O. (2021). Knowledge management system in pharmaceutical healthcare sector: A conceptual research. *Journal of Pharmaceutical Research International*, 290–297. <https://doi.org/10.9734/jpri/2021/v33i44b32679>

Tsekhmister, Y., & Lysenko, O. (2018). The process of the future pharmacists' professional competence formation at the higher medical educational establishments. *Fundamental and Applied Researches in Practice of Leading Scientific Schools*, 25(1), 70–76. <https://farplss.org/index.php/journal/article/view/275>

Van Esbroeck, R. (2008). Career guidance in a global world. In *International Handbook of Career Guidance* (pp. 23–44). Springer Netherlands. https://doi.org/10.1007/978-1-4020-6230-8_2

Received: 17 December 2021 | **Accepted:** 2 February 2022 | **Published:** 24 March 2022



This is an Open Access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.