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THE PSYCHOLOGICAL FOUNDATIONS OF THE FORMATION OF PROFESSIONAL ORIENTATION OF HIGH SCHOOL STUDENTS BASED ON DIGITAL TECHNOLOGIES

Abstract

Vocational guidance plays a crucial role in assisting students in making informed decisions about their future careers by identifying suitable directions and spheres of professional activity. With the rapid advancement of digital technologies, it becomes imperative to explore how these tools can enhance the process of vocational guidance of high school students. This article explores the various digital technologies that can be utilized in vocational guidance programs by teachers and psychologists.

More precisely, in the paper, the benefits, challenges and perspectives of implementing digital technologies in the professional orientation practices are analyzed. Furthermore, the methods of conducting vocational guidance are considered and represented in a model. As for empirical study, an original online psychological test for the analysis of senior school students' preferences and attitudes towards five types of professions was carried out. The obtained results were broken down in terms of the level of compatibility with the occupation types.

The findings show that digital technologies provide favorable conditions and useful tools for organizing vocational guidance, conducting psychodiagnostic tests, and enabling feedback. For instance, online surveys and tests with the content analysis capability can be created with the use of special programs or applications. Modern educators and psychologists, who are encouraged to apply digital technologies in their professional activity, as well as school students, well-informed and skilled in new technologies, will likely to be interested in the digitalized career guidance.

Key words: vocational guidance, digital technologies, senior school students, online psychological test, professionally significant skills.

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ПСИХОЛОГИЧЕСКИЕ ОСНОВЫ ФОРМИРОВАНИЯ ПРОФЕССИОНАЛЬНОЙ ОРИЕНТАЦИИ СТАРШЕКЛАССНИКОВ НА ОСНОВЕ ЦИФРОВЫХ ТЕХНОЛОГИЙ

Аннотация

Профессиональная ориентация играет решающую роль в оказании помощи учащимся в принятии обоснованных решений относительно их будущей карьеры путем определения подходящих направлений и сфер профессиональной деятельности. С быстрым развитием цифровых технологий становится необходимым изучить, как эти инструменты могут улучшить процесс профессиональной ориентации старшеклассников. В этой статье исследуются различные цифровые технологии, которые могут быть использованы в программах профессиональной ориентации педагогами и психологами.

Точнее, в статье анализируются преимущества, проблемы и перспективы внедрения цифровых технологий в практику профессиональной ориентации. Кроме того, рассмотрены и представлены в виде модели методы проведения профессиональной ориентации. Что касается эмпирического исследования, то был проведен оригинальный онлайн-психологический тест для

анализа предпочтений и отношения старшеклассников к пяти типам профессий. Полученные результаты были разбиты по уровню совместимости с типами профессий.

Полученные результаты показывают, что цифровые технологии обеспечивают благоприятные условия и полезные инструменты для организации профессиональной ориентации, проведения психодиагностических тестов и обеспечения обратной связи. Например, онлайн-опросы и тесты с возможностью контент-анализа могут быть созданы с помощью специальных программ или приложений. Современные педагоги и психологи, которым рекомендуется применять цифровые технологии в своей профессиональной деятельности, а также школьники, хорошо информированные и владеющие новыми технологиями, скорее всего, заинтересуются цифровой профориентацией.

Ключевые слова: профессиональная ориентация, цифровые технологии, старшеклассники, онлайн-психологическое тестирование, профессионально значимые навыки.

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ЦИФРЛЫҚ ТЕХНОЛОГИЯНЫҢ НЕГІЗІНДЕ ЖОҒАРЫ СЫНЫП ОҚУШЫЛАРЫНЫҢ КӘСІБИ БАҒДАРҒЫН ҚАЛЫПТАСТЫРУДЫҢ ПСИХОЛОГИЯЛЫҚ НЕГІЗДЕРІ

Аңдатпа

Кәсіби бағдар оқушыларға кәсіби қызметтің қолайлы бағыттары мен салаларын анықтау арқылы болашақ мансаптары туралы негізделген шешімдер қабылдауға көмектесуде үлкен рөл атқарады. Цифрлық технологияның қарқынды дамуымен бұл құралдар орта мектеп оқушыларының кәсіби бағдарлау процесін қалай жақсартатынын зерттеу қажет болып табылады. Бұл мақалада педагогтар және психологтармен кәсіби бағдарлау бағдарламаларында қолдануға болатын әртүрлі цифрлық технологиялар зерттеледі.

Дәлірек айтқанда, мақалада цифрлық технологияларды кәсіби бағдарлау тәжірибесіне енгізудің артықшылықтары, проблемалары мен перспективалары талданады. Сонымен қатар, кәсіби бағдарлау әдістері қарастырылып, модель түрінде ұсынылған. Эмпирикалық зерттеуге келетін болсақ, жоғары сынып оқушыларының бес кәсіп түріне деген қалауы мен көзқарасын талдау үшін түпнұсқа онлайн психологиялық тест өткізілді. Алынған нәтижелер кәсіп түрлерімен үйлесімділік деңгейіне қарай бөлінді.

Нәтижелер бойынша, цифрлық технологиялар кәсіби бағдарлауды ұйымдастыру, психодиагностикалық сынақтарды өткізу және кері байланысты қамтамасыз ету үшін қолайлы жағдайлар мен пайдалы құралдарды қамтамасыз етеді. Мысалы, мазмұнды талдау мүмкіндігі бар онлайн сауалнамалар мен тесттерді арнайы бағдарламалар немесе қолданбалар арқылы құрастыруға болады. Кәсіби қызметінде цифрлық технологияларды қолдануға шақырылатын заманауи педагогтар мен психологтар, сондай-ақ жаңа технологияларды жақсы біліп, жетік меңгерген оқушылар цифрлық кәсіптік бағдарлауға қызығушылық танытуы мүмкін.

Тірек сөздер: кәсіптік бағдар, цифрлық технологиялар, жоғары сынып оқушылары, онлайн психологиялық тест, кәсіби маңызды дағдылар.

Introduction. Relevance of the study. The vocational guidance process plays a crucial role in helping individuals discover their career paths and make informed decisions. Traditional methods often involve face-to-face counseling, self-assessment tests, and access to physical resources such as books and brochures. However, with the advent of digital technologies, the vocational guidance landscape has witnessed significant transformations. These technologies offer numerous opportunities for enhancing the effectiveness, reach, and efficiency of vocational guidance.

The transition from high school to higher education or the workforce is a critical period in a student's life. Vocational guidance programs are designed to help high school students make informed

decisions about their future profession. They use diverse tests, surveys and other methods to let learners evaluate their interests, preferences and inclinations for a particular direction or type of professional activity, discovering in themselves professionally significant skills and personal qualities that will contribute to their career growth.

Digital technologies have become an integral part of the modern society and revolutionized various fields, including education. Various programs and applications allow to create online surveys and tests, multimedia presentations and videoclips for educational purposes. Considering the importance of selecting future specialization when graduating from high school, it is culturally appropriate to study the use of digital technologies for improvement and enhancement of vocational guidance programs for school students.

As such, the **aim of the study** is to analyze the benefits, perspectives, and difficulties of using digital technologies in the development of professional orientation programs, as well as to design and conduct an online vocational guidance test among high school students.

Tasks of the study:

- 1) to analyze the benefits and potential of digital technologies in the design of vocational guidance programs;
- 2) to consider the challenges of using digital technologies for formation of vocational guidance;
- 3) to analyze the connection between psychological characteristics of personality, such as personal traits and soft skills, and professional spheres;
- 4) to design and conduct an online professional orientation test for high school students, considering the types of personality and professions.

Literature review. Among Russian scholars, who studied the problem of vocational guidance of students A. K. Belousova should be noted. Examining the capabilities and instances of pedagogical innovations in the process of vocational guidance in terms of integration of basic and additional education, the author suggests introducing and explaining high school students the specifics of working with software suitable for this or that profession. For example, the «Adobe Photoshop» program is applied by graphic and web-designers; and students interested in this field may complete practical tasks to probe this application [1].

The possibilities of using universal digital technologies to support the professional self-determination of students were considered by E.V. Soboleva and her colleagues. Analyzing multifunctional digital technologies in the context of a new paradigm of learning, they proposed they idea to fully realize the capacity of existing common technologies, focusing on MS Excel. Furthermore, the researchers conducted a test among university students which assessed their level of formation of diverse qualities and skills significant for a particular type of profession [2].

Other Russian scientists E.A. Korotkova and M.A. Karabut analyzed the ways of integration of traditional approaches to career guidance and the functionality of digital platforms, designing a multi-level model of vocational guidance management in their region. They also pointed out several risks of digitalization of the process of career guidance, such as the virtualization of vocational guidance work, limitations of the forms and content of career guidance due to the interface of the designed platform [3].

Considering foreign scholars, H.El Mrabet and M. Abdelaziz in their article examined a smart school guidance system called "ETC guidance system", which contributes to the reduction of failure orientation cases and creation of a favourable environment for the successful adaptation of career guidance by schools with the regard of students' cognitive trends, using Internet of things and mobile devices [4].

R.N. Inderanata and T. Sukardi (2023) investigated the impact of integrated vocational guidance on readiness of school students for working in the field of mechanical engineering. They pointed out the problem of lack of realization of demonstrative method when teaching about machining practices with the redundancy of explanation method [5].

O.V. Almazova and her collaborators considered the use of digital technologies by teachers for vocational guidance of students with mental retardation (2020). They indicated not only the problems of digitalization of vocational guidance, but also the directions and content, methods and tasks of career guidance of students with mental retardation [6].

Other scholars, J. Kettunen and J.P. Sampson (2019) analyzed the challenges of application of ICT in career services by means of phenomenographic investigation method. They distinguished several aspects of challenges, according to career development experts' opinions on the issue: inadequate access to ICT and information, insufficient skills and competencies, as well as ineffective integration [7].

In Kazakhstani scientific community, researchers mostly examine the problem of integration of digital technologies in the educational process, rather than digitalization in vocational guidance. For instance, G.Z., Niyazova and U.A. Tursynbekov (2022) analyzed the changes in teaching methodology in the context of digital transformation of education [8]. Similarly, training of future mathematics about methods of teaching geometry in the light of digitalization of education was considered by N.S. Uteuliyev and his colleagues (2023) [9].

It should be noted that teachers' competency in terms of utilizing digital technologies for professional purposes is critical in modern education and vocational guidance. Understanding that Zh.I. Sardarova, G.N. Kismetova, et al (2022) investigated the ways of forming readiness of future teachers to use digital educational resources in modern digitalized education [10].

Material and methods. To achieve the aim of the research the following methods were implemented:

- 1) theoretical analysis of literature on the issue;
- 2) modelling the interconnection of personal characteristics and types of occupations;
- 3) method of psychodiagnostics, testing on the topic "Type of professions suitable to the psychological characteristics of a personality."

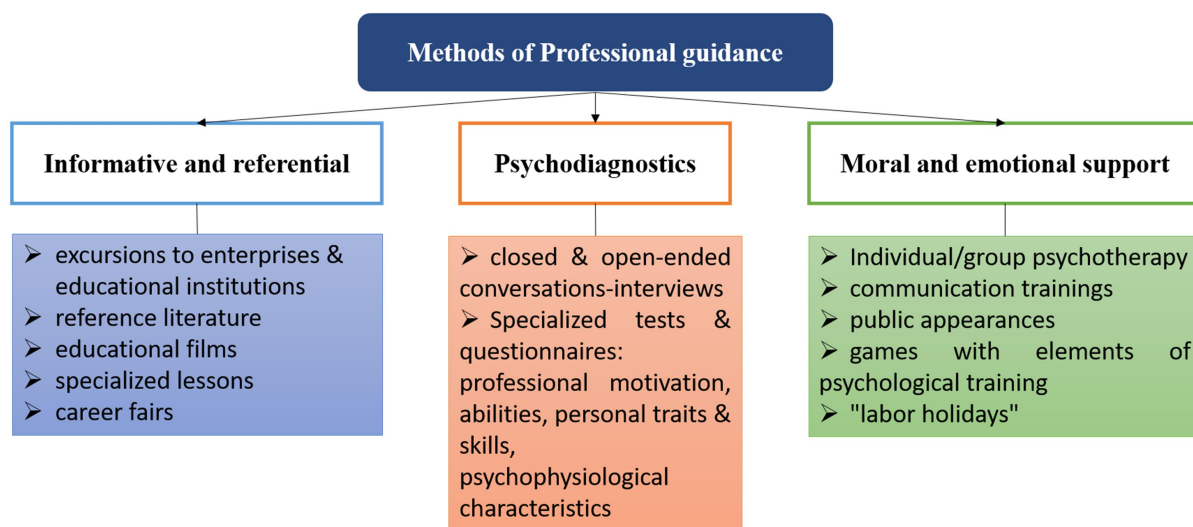
The test on vocational guidance was carried out among 60 senior school students of 56th and 95th schools in Almaty. It consists of 26 questions with three options.

Results and discussion. *Theoretical research.* First of all, let us revise the meaning of the term "professional orientation" or "career guidance". It can be defined as a system of measures aimed at helping young individuals choose a profession and specialty (UNESCO) [11]. These include the activities organized to form the persons' professional self-determination, considering their interests, inclinations and abilities, as well as taking into account the demands of the economy in specialists of this or that profile.

There are various methods of vocational guidance. They can be divided into three main types:

- Informative and referential;
- Psychodiagnostics;
- Methods of moral and emotional support (N.V. Shvetsova, 2020) [12].

The examples of professional guidance methods are demonstrated in Picture 1.



Picture 1. Methods of professional guidance

In terms of the use of digital technologies in the process of vocational guidance, we may point out the following aspects:

1. *Online Career Assessments.* Digital platforms offer online tests or questionnaires that assess what occupations suit the particular student's type of personality, analyzing their interests, preferences, skills, and aptitudes. These assessments provide personalized feedback and recommendations for potential career paths, enhancing the effectiveness of vocational guidance.

Regarding implementation of psychodiagnostics, it is more convenient to conduct online psychological tests than paper-based ones due to the simplicity of collecting, storing and analyzing data. For instance, Google Forms with understandable interface allow to create diverse questionnaires and tests, providing visualized data analysis. Both test takers and researchers will find it easy to use digital technologies for professional guidance.

2. *Virtual Reality (VR) Applications.* Virtual reality applications allow students to explore various career settings, providing a realistic and immersive experience. Students can virtually visit workplaces, interact with professionals, and gain hands-on knowledge about different occupations, aiding in making well-informed career decisions.

3. *Online Resources and Portals.* Digital technologies provide access to a wide range of online resources and portals that offer comprehensive information about different careers, educational pathways, job markets, and vocational training opportunities. These resources empower students to independently research and explore various career options. The official university websites also should be noted, since they provide a list of accessible educational programs and specialties.

One of the considerable digital programs for vocational guidance is BECOME Education. It encourages students to learn about themselves and the vast world of labor. The BECOME program comprises teacher-led classes as well as an app for students with over 50,000 job options. It allows students to examine their interests, motivating factors, and inclinations, as well as discover the ways of interacting with work, via an intensive learning process supervised by professors. Students aged 10 and above may evaluate their own background and preconceptions, learn to establish their own goals, and explore a variety of professional options (ODiCY) [13].

4. *E-Learning Platforms.* Online educational platforms such as Coursera and Udemy enable students to acquire industry-specific knowledge and skills. These platforms offer online courses, webinars, and tutorials, providing flexible learning opportunities and built – in assessments. High school students can register to these platforms and gain insights into different professions before making career choices. Furthermore, the learner who successfully passed a course may get a certificate that will complement his or her CV.

5. *Online psychological trainings* may be dedicated to the development of professionally significant skills, including soft ones: communicative and collaborative skills, digital literacy, critical thinking, time-management, etc. Psychological trainings organized via web-conferences allow a large number of individuals from anywhere to participate in them. Most commonly used conference platforms like Zoom and Google Meet have enough functions to demonstrate presentations and enable oral or written discussion of the topic.

Regarding the benefits of implementing digital technologies for providing vocational guidance, they comprise the following:

- ❖ Increased accessibility to vocational guidance resources and tools (Moore N, et al) [14];
- ❖ Personalized and tailored guidance based on individual preferences and strengths;
- ❖ Enhanced student engagement and motivation through interactive digital platforms;
- ❖ Realistic experiences through virtual reality applications;
- ❖ Multiple online psychological tests and psychodiagnostic methods dedicated to selecting professions.

Nevertheless, psychologists and educators may encounter some challenges with digitalization of the process of vocational guidance. For instance:

- Access and equity issues related to the availability of digital technologies and network;

- The need for training and professional development of teachers and counselors to effectively utilize digital tools;
- Maintaining the quality, accuracy and reliability of online career information sources;
- Ensuring user privacy and data protection when registering in different portals;
- Balancing the use of digital technologies with in-person guidance and support.

Considering the perspectives of integration of Internet-technologies into vocational guidance programs at the level of schools, such implications may be distinguished:

A. *Opening up new opportunities for improved career decision-making processes.* They involve diverse educational platforms and informative websites, courses and webinars, online testing, virtual excursions, etc. However, it is essential to address the challenges mentioned above and facilitate equitable access to technology for all students. Future research should focus on exploring the long-term impact of digital technologies on the career success and satisfaction of high school students.

B. *Utilizing Digital Tools for Self-Assessment.* Digital technologies provide individuals with new and innovative tools for self-assessment, empowering them to better understand their skills, interests, and values. Online platforms and applications offer various tests that provide personalized career suggestions based on individual responses. These digital tools aid in the identification of strengths, weaknesses, and potential career matches, allowing for a more accurate and comprehensive self-assessment process.

C. *Access to Real-Time Labor Market Information.* Digital technologies offer unparalleled access to real-time labor market information, ensuring that vocational guidance processes are up-to-date and aligned with current job trends. Online databases, job portals, and career exploration websites provide individuals with information on job demands, salary trends, skill requirements, and future prospects. This access empowers individuals to make informed decisions by aligning their aspirations with the realities of the job market.

D. *Virtual Career Exploration.* Digital technologies enable immersive and interactive virtual career exploration experiences. Virtual job-shadowing, vocational simulations, and online career fairs expose individuals to various career options without the need for physical travel or attendance. Virtual reality (VR) and augmented reality (AR) technologies allow users to experience realistic job settings and gain insights into different professions, helping narrow down their career choices effectively.

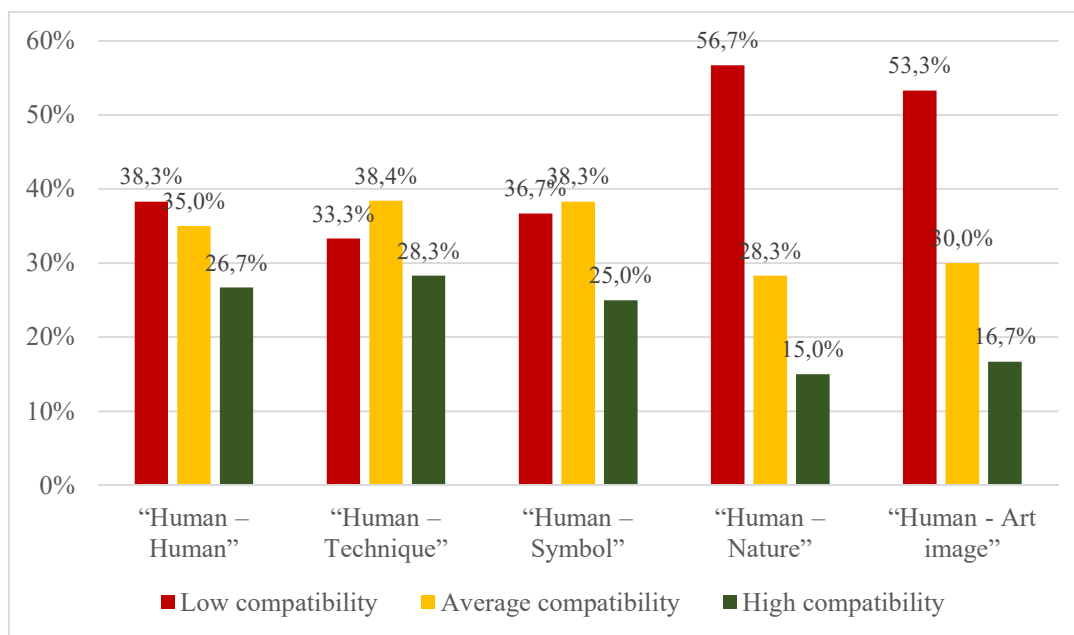
E. *Enhanced Guidance and Counseling Support.* Integrating digital technologies in vocational guidance provides opportunities for enhanced guidance and counseling support. Live chat support, video conferencing, and webinars enable remote access to career counselors and subject matter experts. This digital connectivity allows for timely support, irrespective of geographical barriers, thereby expanding the accessibility of vocational guidance services.

Empirical study. An online psychological test for analyzing personality's characteristics and suitable field of specialization was conducted among senior school students of Almaty.

In general, the categories of professions by E.A. Klimov were considered in our test:

- 1) "Human – Human"
- 2) "Human – Technique"
- 3) "Human – Symbol"
- 4) "Human – Nature"
- 5) "Human - Art image" [15]

The analysis of obtained data is provided in Picture 2.



Picture 2. Results of the psychological test on vocational orientation

According to the results of testing, 16 students have high compatibility with occupations that imply personal interaction. 35% of the surveyed individuals have average compliance level with "Human-Human" professions, whereas 38% of senior school students do not like working with people and try to avoid communication.

As for the "Human-Technique" type of professions, 23 persons demonstrated average degree of compatibility, while 33.3% of the study participants have low compliance level regarding it. 17 individuals showed high interest and inclinations for working with technologies and devices.

Considering professions that imply working with sign system, $\frac{1}{4}$ of the test takers have shown positive results of compatibility. Some senior school students (22 individuals) are not interested in "Human-Symbol" type of occupations, and the rest of them demonstrated average level of compatibility.

When it comes to professions related to observing or interacting with nature, the majority of modern high school students do not have desire to work in this sphere of activity. Only 15% of the test takers selected options concerning flora, fauna, meteorology, or geology. 17 teenagers have average compliance level with "Human-Nature" type of occupations.

Proceeding to the field of arts, most 10-11th grade students have low indicators of compatibility. Probably, that is because teenagers with artistic talents usually leave comprehensive school and enter art college. 30% of the senior school students showed average level of compliance with "Human-Art image" occupations. Only 10 out of 60 people have high compatibility with this type of vocations.

As such, corresponding to the results of the online vocational guidance test, considerable number of adolescents see their career paths in the sphere of technologies, business or communications, dealing with written texts or numbers. It is rare among modern students to have motivation to work as biologists, chemists, geologists, veterinarians, etc. Artistic persons frequently choose to study in art colleges after finishing the 9th grade.

Conclusion. Thus, digital technologies offer significant potential for transforming vocational guidance programs for high school students. Various instances of Internet-technologies and resources enhance the effectiveness of vocational guidance processes, empowering students to make informed career decisions. However, careful implementation and ongoing research are necessary to ensure that technology-based vocational guidance remains inclusive, accurate, and reliable.

The integration of digital technologies in the vocational guidance process presents considerable opportunities for individuals seeking informed career choices. By leveraging digital tools, self-

assessment tests, real-time labor market information, virtual career exploration, and enhanced counseling support, vocational guidance can become more accessible, efficient, and personalized. Moreover, thanks to visualization of the reference material and differentiation of forms of professional orientation, senior school students may be highly motivated and engaged in the process of discovering career options and own preferences.

While challenges and ethical implications, such as the decreased face-to-face interaction and personalized guidance, along with the need to master unfamiliar digital tools, are to be addressed, the positive impact of incorporating digital technologies outweighs the potential drawbacks. As such, it is crucial to embrace these technologies and aim for a synergy between human guidance and digital innovation in the vocational guidance process.

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