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# The system of organising career guidance for pedagogical specialities of life sciences universities

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**Abstract.** The aim of the article was to develop models (systems) for organising career guidance work for pedagogical specialities at life sciences universities. The article presented information on the creation and verification of the effectiveness of a career guidance system for pedagogical specialities at agricultural and environmental universities, which was regarded as a holistic unity built on scientific and organisational foundations with structured components that were closely interrelated and interdependent, forming a corresponding functional integrity. It was established that the developed system had specific features, as it ensured the selection of applicants for pedagogical specialities at life sciences universities, whose task was to train specialists in bioeconomic professions of the "human-nature" type. It was emphasised that the model included target, methodological, content, operational, result-oriented, and control-corrective components, which made it possible to achieve synergy between objectives, tasks, approaches, principles, content, pedagogical conditions, forms, methods, tools, and actions of the subjects involved (teachers, parents, career advisers from graduating departments, students, employers) within a structured, algorithmic collaboration. The model was based on systemic, competency-based, learner-centred, and axiological approaches and was implemented algorithmically with step-by-step application of forms, methods, techniques, tools, and activities in line with the component-based structure of personality. It was analysed that the implemented algorithm involved the use of verbal methods, methods for activating the need to choose a pedagogical profession at life sciences universities, testing of professional skills and abilities, and reflective methods for professional self-determination. The system included mechanisms for monitoring its effectiveness, which made it possible to track the dynamics of enrolment and indicators of promotional activity by educational process stakeholders. This demonstrated its effectiveness, as evidenced

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by the dynamics of submitted applications and actual enrolments from 2020 to 2024, despite objective complicating factors such as the COVID-19 pandemic, war, and significant youth migration abroad. It was noted that the effectiveness of the system for organising career guidance work for pedagogical specialities at life sciences universities depended on the provision of specific pedagogical conditions and adherence by career promotion agents to the corresponding methodological recommendations

Keywords: model of career guidance system; career orientation tools; diagnostics of professional orientation among applicants to pedagogical programmes; participants in the career guidance process; career choice advisers; mechanisms for monitoring quantitative indicators of enrolment in pedagogical specialities

## Introduction

The issue of selection for higher education institutions, both in the international and Ukrainian context, was significant in terms of societal development, especially during a period of dynamic progress in technotronic civilisation, with the introduction of artificial intelligence, the integration of robotics, neural networks, cloud services, and machine and programmable learning technologies into all spheres of life. In particular, M. Ford (2015) emphasised that the world was rapidly changing under the influence of technologies that rendered humans redundant, especially in performing routine operations that algorithms could easily carry out. The futurist researcher M. Ball (2022) examined how virtual spaces and augmented reality technologies would influence education, how social relationships, the economy, education, professional self-determination, and culture as a whole would change. The author stressed that metareality would expand human capabilities while also posing new challenges for humanity concerning professional reorientation.

Interesting ideas regarding the relevance of career guidance work to be conducted on new foundations were proposed by P. Diamandis & S. Kotler (2020), who emphasised the rapid development of virtual reality technologies, artificial intelligence, cryptocurrencies, digital biology, the creation of symbionts, and pointed out that the range of professions and positions would fundamentally change, both globally and locally. The authors predicted that many professions would undergo transformation due to automation and the introduction of artificial intelligence. Routine tasks would gradually be performed by machines, while human work would focus on creativity, management, and emotional intelligence. It was important to orient people now towards acquiring skills that would be relevant in the near future. In the future, there would be increasing demand for specialists in the social sciences, psychologists, wordsmiths, ethical consultants, and skills in interaction and creative thinking would be in demand. Professions related to education would remain relevant, as learning and retraining would become an integral part of life. These ideas were reflected in the monograph by Ukrainian scholar O. Polishchuk (2022), which developed theoretical and methodological materials that could be used by educational stakeholders to foster senior pupils' readiness to choose a profession – as this would determine the economic development of the country in the digital technology era.

The particular interest in career guidance issues was also confirmed by the research of scholars. For instance, T. Pham *et al*. (2024) analysed 383 publications on the topic and established that, from the second half of the 20th century to the present day, there had been a significant increase in attention to professional choice, ensuring social justice in the career decision-making process, as well as social support and the participation of mentors in career orientation.

Ukrainian researcher S. Koda (2020) examined how changes in education influenced the process of choosing a profession. The author analysed new approaches that helped pupils consciously choose the professional path – particularly the integration of digital technologies, project-based learning, and the development of soft skills. Indian scholars G.A. Herath *et al.* (2024) emphasised the importance of restructuring career guidance work and using the achievements of the digital knowledge society in professional promotion and the professional self-determination of the younger generation. The scholars drew attention to the widespread use of computer tools, artificial intelligence systems, online assessment platforms, adaptive learning systems, and mobile applications that contributed to effective career counselling.

Given this, the issue of defining the place and role of humans in the production chains of the future, and ensuring proper career selection in accordance with aptitudes and talents, became increasingly important. It was thus quite reasonable to set tasks for restructuring career guidance work toward the positions and professions that would be in demand in the near future. For the rational redistribution of the labour force, especially under the Ukrainian circumstances marked by the Russian-Ukrainian war, the extermination of the Ukrainian people, mass emigration (8 million citizens left the country), and losses in the labour force and human capital, the creation of a career guidance system – particularly for pedagogical specialities at life sciences universities – gained increasing significance. Two vital professions – the teacher and the farmer – were combined in this objective. Teachers designed society's development for generations ahead, while agrarian farmers guaranteed food security, economic survival, and the country's defence capability during a period of existential war.

The aim of this research was to justify and design a model for organising career guidance work aimed at attracting entrants to pedagogical specialities at life sciences universities. Within this context, the following objectives were important: to model the career guidance system taking into account its key components (target, content, methodological, operational, and control-corrective components); to highlight the methodological approaches and content of career guidance work for pedagogical specialities at life sciences universities; to develop an algorithm for applying forms, methods, techniques, and tools in accordance with the stages of implementing career guidance work for pedagogical specialities at life sciences universities.

## Literature Review

Researchers who paid considerable attention to the organisation of career guidance work and published the findings in monographs, scientific articles, textbooks, or manuals were noted. For example, scholars from the Catholic University of Portugal, V. Khurumova & J. Pinto (2023), highlighted that career services should have been a priority for higher education institutions and that it was necessary to establish departments dedicated to the development, implementation, and evaluation of academic and career plans and decisions of prospective applicants. The authors stated that most applicants and students were open to using online consultations, but also stressed the importance of direct, "live" contact between the applicant and the career consultant. In the career guidance system, especially in choosing modes of consultation, it was essential to consider that the level of stress resilience and psychological capital affected the effectiveness of online counselling, since these characteristics helped individuals better adapt to changes and challenges related to career development (Pordelan & Hosseinian, 2021).

Polish scholar R. Porzak *et al.* (2018) analysed key concepts and methods of career counselling and identified approaches such as systemic, constructivist, and integrative. The author drew attention to changes driven by scientific and technological progress, emphasising that the development of information technology, robotics, and artificial intelligence significantly influenced the labour market. According to the author, these changes required new approaches to career

counselling and adaptation to rapidly changing working conditions. R. Porzak *et al.* (2018) recommended focusing on the development of flexible skills (critical thinking, creativity, communication, adaptability, and lifelong learning) and called for closer cooperation between educational and industrial sectors to create programmes aligned with labour market needs.

Ukrainian scholar O. Hrinova (2018), in the dissertation, studied the psychological mechanisms influencing the life path planning of young people. The author described how personal traits, social factors, and values influenced life goal setting and strategies among the younger generation, noting that career choice should be conscious. H. Alieksieieva (2024) analysed methods for assessing the effectiveness of career guidance activities and proposed the use of comprehensive approaches in career diagnostics (surveys, observation, labour market analysis, and evaluation of guidance programme results). The author highlighted the importance of systematic monitoring to improve career guidance approaches. T. Klybanivska (2020) focused on the conscious career choice of senior pupils, stressing the factors influencing self-determination, with the most significant being social environment, psychological characteristics of the applicant, and the educational setting. The author emphasised the need for an individual approach and the creation of conditions for developing personal qualities that would support informed career choices. Practitioner in career guidance, educator, and Ukrainian scholar S. Koda (2020) demonstrated how changes in education influenced career choice processes and described new approaches that created conditions for pupils to consciously select the professional growth paths.

These new approaches involved integrating digital technologies, project-based learning, and the development of soft skills, along with the support of career advisers. I. Myshchyshyn & Yu. Dmytriv (2020) analysed social, psychological, and economic factors influencing career choice. The authors emphasised the decisive role of family, school environment, and media in shaping youth's professional orientation. Ukrainian scholar Z. Okhrimenko (2021) analysed a system of activities aimed at helping students choose a profession. The author described various methods of career guidance, including consultations, training sessions, masterclasses, and workplace internships. The author emphasised the importance of integrating theoretical knowledge with practical skills for successful professional development and underlined the relevance of career guidance in modern society. The author examined the axiological foundations of career selection, emphasised its importance, and proposed several diagnostic methods focused on personal values and the influence on career choice. The scholar also provided practical recommendations for HR professionals, including: focus on the candidate's personal values, use of comprehensive diagnostic methods, consideration of sociocultural context, and labour market specifics. In a collective article by Ukrainian researchers L. Rebukha *et al.* (2022), the directions and stages of career guidance work in general secondary education institutions were presented (diagnosis of aptitudes, career education, counselling, development of individual guidance trajectories). Special attention in career counselling was paid to the role of the teacher. At the same time, the issue of applying a systemic approach in developing a comprehensive career guidance model for pedagogical specialities at universities preparing bioeconomic professionals of the "human-nature" type was still insufficiently explored in the academic literature.

## Materials and Methods

The system of career guidance for pedagogical specialities was developed and implemented at the National University of Life and Environmental Sciences of Ukraine (which, according to international classification, belonged to life sciences universities) during 2017-2024. It included the launch of two pedagogical specialities and three educational-professional programmes (Bachelor's – "Professional Education"; Master's –

"Higher Education Pedagogy" and "Information and Communication Technologies in Education"), which were largely finalised in terms of methodological support by 2019. This constituted the first, preparatory stage, during which methods such as analysis of curricula and educational programmes of both foreign and Ukrainian universities were applied, along with comparison and selection of educational content. This aligned the pedagogical programmes – where the guidance system was implemented – with leading European and national analogues (Vasiuk, 2019; Sopivnyk, 2020). During the second stage (2019-2020), the model of career guidance for pedagogical specialities was developed using the modelling method, which involved creating a graphical twin of the phenomenon under study. The third stage, from May 2020 to October 2024, involved the implementation and refinement of the model through monitoring and adjusting its main components, considering changes in admission conditions and rules. Observation, interviewing, statistical processing of career activity data from educational process stakeholders, and enrolment indicators were used. At this stage, monitoring of quantitative and qualitative parameters of student enrolment was conducted, and conclusions were drawn about the effectiveness of the system.

The sample included applicants who submitted applications for pedagogical specialities at one of two life sciences universities – namely, the National University of Life and Environmental Sciences of Ukraine. The general population was less than 10,000 individuals, so according to the "Paniotto Grid", a representative sample could consist of fewer than 400 persons. The study covered a cohort of 604 bachelor's and 632 master's level applicants, making the data fully representative. As the career guidance model for pedagogical specialities in life sciences universities was implemented, the dynamics of enrolment across three pedagogical programmes were analysed from 2020 to 2024 – including the number of applications submitted, number of enrolled students, and the percentage of admitted applicants out of total applications. Influence from external, non-experimental factors (i.e. unrelated to the implemented model) was also tracked – including changes in admission requirements such as the introduction of the National Multi-Subject Test (NMT), Unified Entrance Exam in Foreign Languages, and Unified Professional Entrance Test for pedagogical specialities. These changes were clearly reflected in the numerical dynamics. The study was conducted in compliance with all methodological standards and adhered to ethical norms (ASA, 2018).

## Results and Discussion

### Modelling the career guidance system with consideration of its key components

Career guidance work, like any other form of activity and cooperation between people, must be based on scientific and organisational principles through structuring and bringing together into a corresponding unity – when the totality of the components of a defined process, which is to unfold in space and time, are parts of a system with close functional connections between them. Such unity resembles a complex mechanism that functions reliably and smoothly, where gears come into contact with other parts with precise calibration, step by step, according to a predetermined and defined algorithm (Ostapenko *et al*., 2024). The same applies to career guidance work in the context of the educational services market, which must be a well-established and structured system, the implementation of which ensures the desired effect.

Selection by vocation within the framework of career guidance for pedagogical specialities at life sciences universities has its specific features, since it concerns the training of teaching staff for working with future specialists in bioeconomic professions of the "human-nature, land, living organisms" type. This type of educational institution focuses specifically on training personnel for the agro-industrial and environmental sectors (Klybanivska, 2020). Life sciences universities have the own specificity. Life sciences, or biosciences, are disciplines that study the world of living nature with all its organisms and

processes (Bhatia, 2019). Life sciences include biology, ecology, medicine, biotechnology, and related fields. These sciences also encompass certain anthropological cycle disciplines, such as anthropology, psychology, and sociology, studying the human being as a biosocial entity. Other humanities disciplines are only partly related to the life sciences – these disciplines complement the abovementioned sciences but do not coincide with them. From this follows that universities where the training of specialists prioritises the study of the aforementioned sciences, as well as applied life sciences derived from sciences (such as agronomy, agroecology, land reclamation, bioengineering, agriculture, health sciences, nutrition science, and others), are referred to as "agricultural", "environmental", or "life sciences universities" (as per European and global practice). Accordingly, the teaching staff trained by universities of this type are professionally equipped – in terms of competencies and programme learning outcomes – to work specifically with learners pursuing bioeconomic professions of the "human-nature" type.

Self-determination in the context of career choice is an important aspect of designing prospects for self-development and career building. The agents of career guidance work at life sciences universities must help young individuals make this choice beneficially – in accordance with the abilities and talents – and to ensure that each person finds the place in nation-building, in the development of the country, by choosing an activity aligned with the inclinations and aptitudes (Fig. 1).

The model includes five main components: the target component reflects the objective, which is to ensure career selection in line with applicants' interests, aptitudes, and talents, and is detailed through the implementation of specific tasks. This includes carrying out career diagnostics for school-leavers and graduates of professional pre-tertiary education institutions, conducting questionnaire surveys on "Criteria and motives for choosing a profession", and applying express methods for identifying aptitudes and talents (Susan Dellinger's psychogeometric test, the game "Family Photo", "String", "Joint Drawing", "People on the Tree", "Creating a Career Silhouette").

Preparation of career guidance agents for fulfilling enrolment tasks included holding seminars to improve the professional skills of academic and teaching staff, particularly in advising potential applicants. This was reflected in a dedicated section on the Pedagogy Department's web resources at NULES of Ukraine (National University of Life and Environmental Sciences of Ukraine) (Criteria and motives…, n.d.). The training programmes for career guidance agents varied in content and depended on the division of responsibilities during the admissions campaign. At this stage, the first pedagogical condition was implemented: "ensuring the readiness of career guidance agents to promote the programme and support applicants during the admissions phase". This condition involved defining a specific group of individuals within the departments who, together with selection committee secretaries, assisted applicants in formalising the applications: submitting forms, advising on motivation letters, entering data into the Unified State Education Database (USEB), and compiling personal files. A separate group was distinguished for those performing communicative roles – engaging with applicants and the parents, able to find the right words and persuasive arguments. This was emphasised by A. Ostapenko *et al.* (2024), who argued that the role of teachers as tutors and facilitators – helping students form an individual educational and professional path – is crucial. Therefore, there is a pressing need to improve teachers' qualifications regarding the implementation of a competency-based approach to career promotion and counselling. In effect, academic, and teaching staff were transformed into agents working with applicants and career advisors equipped with methodological and psychological readiness to carry out career guidance functions, establish contact with potential entrants and the parents, and support the abovementioned groups of people throughout the admissions process. These agents were usually recruited from among the most qualified experts

in the field, holding academic degrees and possessing a deep understanding of the nature of the specialities, professional characteristics, employment prospects, and labour market demand for the training the agents represented. The agents mastered applicant diagnostics techniques, understood applicant psychology, knew the conditions and rules of admission, motivation letter requirements, and competitive score calculation methods. To master a wide range of formats and methods of working with applicants, these agents, and counsellors were equipped with knowledge, skills, and abilities through specialised classes and individual instructions, provided by experienced specialists from graduating departments and admissions committee members.


***Figure 1.*** *System of career guidance work for pedagogical specialities at life sciences universities*
***Source:*** *developed by the authors*

Optimisation of career promotion was achieved through applying the advice of "compliance professionals". Career guidance agents understood the process of operating within a market and knew that an educational service is a product, the quality of which determines demand, and a potential applicant is a client who will choose the best product. Even if clients do not understand the desires – as Steve Jobs once said – the clients were instilled with a useful desire and interest in professions and the motives for choosing a professional development path were activated (Isaacson, 2011). Advice on applying marketing techniques in the educational services market, tested by psychologist, marketer, and business consultant R. Cialdini (2009), proved effective and efficient.

Provision of individual support for potential entrants up to the moment of enrolment. At the National University of Life and Environmental Sciences of Ukraine – a university belonging to the life sciences category – the Academic Council of the Faculty of Humanities and Pedagogy adopted a decision encouraging academic and teaching staff to involve at least two interested potential entrants in the institution's activities. These entrants, interacting with professors and associate professors of the department, recognised the value of the exchange (Sopivnyk *et al.*, 2023). Such lecturers attracted youth with the original disciplines, innovative forms and methods of pedagogical interaction, and master classes, and as mentors, the lecturers ensured educational support for the personal and professional development of both entrants and future students.

Provision of quality educational services in the training of pedagogical personnel. An educational service, unlike basic services, is complex, multifaceted, and extremely demanding. Yet it is still a service – like car maintenance or a beauty salon – where everything matters: location, facilities, interior aesthetics, equipment, staff, and expected results supported by previous graduate successes. Modelling a career guidance system included continuously updating the content of pedagogical training, responding to employer demands, and introducing relevant disciplines accordingly.

**Highlighting methodological approaches and the content of career guidance for pedagogical specialities at life sciences universities**

The methodological component of the proposed system (model) includes approaches and principles that guided the work. The first and most important was the systemic approach, which ensured synergy and measurable results. It provided a holistic view of the career guidance process, linking all elements: pupils, students of pre-tertiary vocational institutions, lecturers, curricula, resources, the social environment, parents, teachers, and key influencers (Department of Pedagogy NULES, n.d.). Career guidance often began with pupils of middle school age and continued through the senior years of pedagogical degree programmes at NULES, creating a continuous developmental line. The process involved employers, form tutors, students, career consultants from the Pedagogy Department, parents, and friends of applicants – all forming a single support system for potential entrants (Cherusheva & Synyakov, 2020). Information was disseminated not only through face-to-face interactions but also via modern technologies, digital tools, self-assessment platforms, testing, and skill analysis (Pordelan & Hosseinian, 2021). This was supplemented by diverse methods and content of career guidance activities, with continuous monitoring and results analysis allowing for corrections to approaches and methods.

The competency-based approach used in the model focused efforts on the acquisition of knowledge, skills, and values by both applicants and students. This included integration into the educational process, individualised support, and personalised counselling for applicants and the parents. This approach prioritised the development of key and professionally essential competencies that enable successful adaptation to the demands of the modern labour market. Instead of mere awareness about professions,

students were taught to make choices, take responsibility, and independently plan the career path. Emphasis was placed on the development of such key competencies as self-awareness, self-assessment, communication, emotional intelligence, and readiness to choose. Specifically, for the "Professional Education. Agricultural Production, Processing of Agricultural Products and Food Technologies" speciality, students gained psychological-pedagogical knowledge and soft skills relevant across work domains, alongside solid training in agro-industrial technologies, agricultural law and economics, animal husbandry, aquatic bioresources, biotechnology, and food technologies. The realisation of the competency-based approach involved helping applicants master such key competencies as self-awareness, critical thinking, communication, and decision-making. This is considered significant in research by T. Kochubei & M. Mishchenko (2021). A. Pidopryhora *et al*. (2022) interpret competency as an integrated ability combining knowledge, skills, and attitudes, all aimed at producing outcomes that reflect graduates' capacity to apply the knowledge in real-world conditions. Thus, academic staff became not only knowledge bearers but also facilitators, mentors, and advisers to applicants and students.

The aforementioned scholars' view is shared regarding the importance of developing skills that meet labour market needs, especially soft skills and the ability to learn independently – key attributes of a modern specialist. Entrants were aware of this due to the inclusion of relevant subjects in curricula, such as "Leadership and Administration", "Foundations of Soft Skills Development", "Start-ups in Education and the Agro-industrial Complex", "Psychology of Manipulative Influences", and others. Dual education and active cooperation between the department and employers were also being implemented.

The learner-centred approach focused on the interests, aptitudes, and talents of potential entrants. Its main goal was to help each person find the own professional path. Individual counselling and testing were conducted, and flexible curriculum options allowed applicants to build the growth trajectory. For instance, in 2022, in response to a request from an applicant "N", courses in "Arbosculpture", "Phytodesign", and "Floriculture" were added to the elective section of the curriculum for the "Professional Education" speciality, as she intended to work as a business coach in a large agro-company, training staff in landscape care. At the same time, psychological support helped applicants better understand the strengths and overcome difficulties. Constant communication, stimulation of self-reflection, and envisioning a future professional life were encouraged. Essentially, at the admissions stage, applicants selected and established contact with a departmental career counsellor, who later became the tutor and supervisor of individual professional development programmes (Ostapenko *et al.*, 2024).

The axiological approach embedded in the model entailed the promotion of professional, civic, and self-realisation values, forming the foundation of career guidance content. An important value for the applicant was – and remains – obtaining a sought-after and prestigious speciality, mastering the anthropological sciences, teaching and mentoring professions, and accessing the opportunities that education provides, particularly for achieving leadership, reaching the highest "growth point" in professional and personal development and self-improvement, integrating into society, contributing to national development and reconstruction, and enhancing the country's defence capacity by passing on social and professional experience to the next generation of professionals in bioeconomic fields. The approaches described above were implemented within the authors' model, in combination with guiding principles such as voluntariness, individual approach, complexity, systematisation, continuity, scientific validity, and accessibility. The content component also included information about curricula and course syllabi, made available to potential entrants through the Pedagogy Department's website at NULES of Ukraine (Educational

and Methodological Support of the Pedagogy Department at NULES of Ukraine). Additionally, this component included informational content based on the premise that socio-economic professions of the "human-to-human" type are prestigious, noble, and timeless, involving interpersonal interaction between two living, intelligent, and thinking systems endowed with consciousness, who exchange various data, information, values, and intellectual and spiritual assets. Crucially, this exchange is accompanied by emotions and the expression of personal attitudes – something that machines or algorithms cannot replicate. Technical devices and programmes can only assist people in socio-economic professions but can never replace the human element. Hence, pedagogical specialities have great potential and are considered eternal (Pidopryhora *et al.*, 2022).

In response to a request, Artificial Intelligence (AI) proposed a list of positions and professions that will remain relevant up to 2030. Notably, many of these are related to the teaching profession, including: ethics manager, digital rehabilitation consultant, companion for the elderly, personal memory curator, virtual reality travel manager, child mental safety specialist, city farmer, bioethics specialist, digital currency adviser, and AI management specialist. Among specifically pedagogical roles, AI identified the following: moderator, educational pathway developer, tutor, project-based learning organiser, online education platform coordinator, start-up mentor, game master, and mind-fitness coach.

**Development of an algorithm for applying forms, methods, techniques, and tools in accordance with the stages of implementing career guidance for pedagogical specialities at life sciences universities**

The operational-activity component of the model (system) comprised the forms, methods, techniques, tools, and measures through which career promotion, counselling, and guidance were implemented. The system is technological in nature and unfolds over space and time in a purposefully defined sequence (Rebukha *et al.*, 2022). This correlates with theories of cognition, reality perception, and the component-based structure of personality (Bekh, 2022). The process began with the implementation of the second pedagogical condition and activation of the information stage of the operational component. At this stage, applicants were provided with information and knowledge about pedagogical specialities at life sciences universities and were shown career development opportunities. This was primarily done through verbal methods: conversations, lectures, presentations, webinars, individual consultations, distribution of brochures, promotional videos, and video interviews with graduates and students, which were made available on the main page of the Pedagogy Department's website (Pedagogy Department of NULES of Ukraine). Career guidance tests were also used to help applicants better understand the interests and aptitudes (Ihnatovych *et al.*, 2021). An original form of work at the graduating department was the use of networking connections – both vertical and horizontal (Ferguson, 2017). Career guidance in the educational services market was carried out in a synergistic unity through horizontal cooperation, converging different forms of collaboration between academic staff and students, supervisors and postgraduate candidates, PhD candidates, within research schools, and between leaders and the followers. Collaboration also included partnerships with distinguished alumni, successful individuals, heads of educational and research institutions, and employers. A notable example was the research school "Formation of leadership capabilities and a value-based worldview of personality", which included several dozen candidates of sciences, PhDs, and Doctors of Pedagogical Sciences working in educational institutions across Ukraine. This school also included top master's graduates in "Educational and Pedagogical Sciences", such as private school founders, directors of professional pre-tertiary institutions, and innovative teachers working with both students and school pupils (Cherednyk, 2025).

During the second, motivational stage, applicants' needs regarding career choice were activated, stimulating conscious decision-making about the professional growth path. Training exercises such as "My Abilities" and "Profession Portfolio" were conducted. Group discussions, coaching sessions, workshops, and meetings with employers in the humanitarian and pedagogical fields were held. Workshops were particularly effective, as confirmed by research conducted by J. Gashi *et al.* (2023), which showed that youth participation in these activities positively influenced the career self-efficacy, realistic expectations regarding the professional future, and the concretisation of the career goals.

During the active stage of the model, applicants engaged in transforming reality through practical activities simulating the pedagogical profession. These included role-play games like "I am the college principal", case studies addressing various pedagogical scenarios (e.g., preparing a lesson on "Decarbonisation of the Agro-Industrial Complex", organising a civic education hour on "Heroes Live Forever!"), practical classes, internships at agro-enterprises in HR management departments with coaching functions (e.g., Biotechnology – Centre of Ukraine, "Silpo", "Shybas"), participation in the "Teacher as a Leader" project, interviews with applicants (Cherednyk, 2024), volunteering, role-play, professional simulation games, the quest "Anthropocentric Professions", the case "Technological Innovation in Pedagogical Creativity", all conducted in the Information and Communication Technology in Education Laboratory of the Pedagogy Department. This laboratory was created as a means to enhance career promotion efforts for pedagogical specialities and is described in a publication by a Ukrainian scholar (Vyhovska, 2024). Applicants had the opportunity to apply the knowledge in practice and test the specifics of the teaching profession (Ostapenko *et al.*, 2024).

The reflexive stage of the operational component involved applicants' self-determination. Based on analysis and self-analysis, comparison of the abilities and potential opportunities, the applicants chose a profession, speciality, and specific pedagogical educational-professional programme. Accompanied by a career adviser from the graduating department, applicants analysed the experiences, assessed the achievements, and drew conclusions about the future field of work. Individual and group reflection was applied – including achievement portfolios, discussions of activities, self-assessment logs, individual professional development plans. This stage also featured personal meetings with applicants to review the experiences and challenges, group discussions for experience sharing, portfolio creation, journal keeping for reflection, and developing personalised plans with short- and long-term goals. These tools helped applicants better understand the preferences and make informed decisions about the careers.

**Creation of result monitoring mechanisms based on quantitative indicators of enrolment in pedagogical specialities**

To achieve the desired outcome, it was essential to engage in solving career guidance tasks and broadly apply marketing techniques to achieve synergy. The graduating department worked to promote its educational programmes. This led to measurable synergy, reflected in the quantitative and qualitative results (e.g., first session results of newly enrolled students). Professors, associate professors, or assistants aimed to be intellectually and professionally appealing to youth, thus becoming reference points for applicants and role models for academic excellence. The extension of fixed-term contracts and the awarding of permanent contracts to academic staff depended on the ability to "magnetise" school pupils, vocational education applicants, and pre-tertiary students – igniting and activating achievement motivation, as confirmed by student surveys. The department tracked the career promotion activity of academic staff by quantifying recruited applicants and, ultimately, by identifying enrolled students to determine the effectiveness of counselling and support in percentage terms. A summary of this information is provided below (Table 1); however, the names of academic staff are omitted for ethical reasons.

***Table 1.*** *Results of career guidance activities of scientific and pedagogical staff of the graduate department for admission to study in the speciality "Professional Education" at the National University of Life Resources and Environmental Management of Ukraine*

| No. | Encrypted names of SPS | Number of applicants enrolled in studies under supervision of the respective SPS | | |
|---|---|---|---|---|
| | | 2022 | 2023 | 2024 |
| 1. | S | 29 | 53 | 29 |
| 2. | Ch | 16 | 23 | 22 |
| 3. | Ko | 5 | 10 | 17 |
| 4. | Di (2022-2023), Sy (2024) | 20 | 12 | 4 |
| 5. | Ho (2022), R | 2 | 5 | 2 |
| 6. | M | 1 | 4 | 2 |
| 7. | A | 3 | 1 | 2 |
| 8. | K | 6 | 6 | 1 |
| 9. | Bu (2022-2023), Mi (2024) | 2 | 1 | 2 |
| 10. | Va | 4 | 3 | 1 |
| 11. | Vy (2024) | 0 | 0 | 1 |
| 12. | Sm | 4 | 6 | 1 |
| **Total** | | **92** | **124** | **84** |

***Source:*** *V. Kostyniuk (2024)*

It is important to note that applicants who received guidance from departmental career counsellors were more frequently and quantitatively satisfied with the choice of the teaching profession and professional development pathway. This is confirmed by surveys comparing applicants who applied independently and those who received support from departmental consultants. Such guidance also influenced the applicants' awareness of the professional development choices, taking into account the abilities, interests, and market conditions. Increasing school-leavers' responsibility for the career choices and fostering a proactive attitude is also relevant to other studies, as stated by A. Ostapenko *et al.* (2024). To support this, data on the dynamics of submitted applications and student enrolments in pedagogical specialities are tracked annually, as shown below (Tables 2, 3, 4).

***Table 2.*** *Dynamics of the number of applications submitted and students enrolled in the speciality, "Professional Education. Agricultural Production, Processing of Agricultural Products and Food Technologies"*

| Year | Number of applications submitted | Number of students enrolled in studies | Number of enrolled students in % |
|---|---|---|---|
| 2020 | 82 | 53 | 65 |
| 2021 | 118 | 55 | 47 |
| 2022 | 105 | 92 | 88 |
| 2023 | 165 | 124 | 75 |
| 2024 | 134 | 84 | 63 |

***Source:*** *developed by the authors based on State Enterprise "Inforesurs" (n.d.)*

As shown in Table 2 and Figure 2, which present the dynamics of student enrolment in the "Professional Education" speciality at the National University of Life and Environmental Sciences of Ukraine from 2020 to 2024, there has been a noticeable increase in enrolment numbers despite

the COVID-19 pandemic, the war, and the full-scale invasion. This growth indicates the viability and effectiveness of the system developed and reflected in the proposed model. A slight decline in the number of enrolled students was recorded in 2024. However, this was not due to any experimental variable but rather the adjustment of admission requirements – specifically, the introduction of a mandatory condition for contract-based admission to the "Professional Education" speciality, requiring NMT (National Multi-subject Test) certificates in four subjects (Fig. 2).

***Table 3.*** *Dynamics of the number of applications submitted and students enrolled at NULES of Ukraine for speciality 011 "Educational and Pedagogical Sciences", educational programme "Higher School Pedagogy"*

| Year | Number of applications submitted | Number of students enrolled in studies | Number of enrolled students in % |
|---|---|---|---|
| 2020 | 111 | 54 | 49 |
| 2021 | 31 | 12 | 39 |
| 2022 | 98 | 50 | 51 |
| 2023 | 74 | 40 | 54 |
| 2024 | 46 | 26 | 57 |

***Source:*** *developed by the authors based on State Enterprise "Inforesurs" (n.d.)*

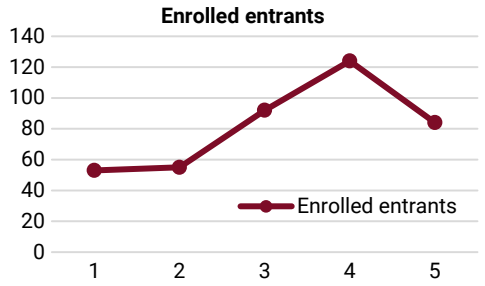


***Figure 2.*** *Dynamics of enrolment in the "Professional Education" speciality at NULES of Ukraine*

***Source:*** *developed by the authors based on State Enterprise "Inforesurs" (n.d.)*

A similar pattern can be observed in the enrolment for two master's degree programmes. However, in 2021, when the Unified Entrance Exam in a foreign language was introduced as a mandatory admission requirement – complicating and formalising the procedure, as applicants also had to take three additional internal entrance tests – these figures objectively declined (Table 3, Fig. 3). Nonetheless, the same system of organising enrolment for pedagogical specialities at life sciences universities proved effective the following year, in 2022, as the enrolment figures quadrupled, allowing for the formation of fully completed groups (Table 4, Fig. 3, Fig. 4).

***Table 4.*** *Dynamics of the number of applications submitted and students enrolled at NULES of Ukraine for speciality 011 "Educational and Pedagogical Sciences", educational programme "Information and Communication Technologies in Education"*

| Year | Number of applications submitted | Number of students enrolled in studies | Number of enrolled students in % |
|---|---|---|---|
| 2020 | 82 | 49 | 60 |
| 2021 | 25 | 9 | 36 |
| 2022 | 70 | 36 | 51 |
| 2023 | 61 | 28 | 46 |
| 2024 | 34 | 20 | 59 |

***Source:*** *developed by the authors based on State Enterprise "Inforesurs" (n.d.)*

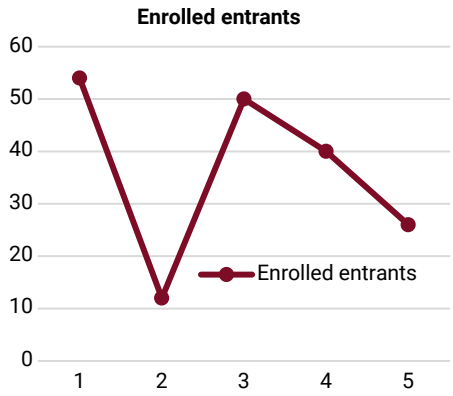


***Figure 3.*** Dynamics of enrolment in the educational program "Higher School Pedagogy" at the NULES of Ukraine

***Source:*** *developed by the authors based on State Enterprise "Inforesurs" (n.d.)*

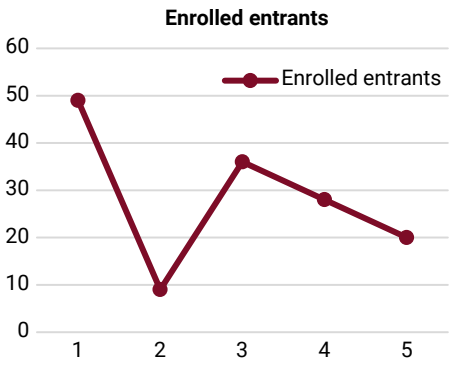


***Figure 4.*** *Dynamics of enrolment in the educational program "Information and Communication Technologies in Education" at the NULES of Ukraine*

***Source:*** *developed by the authors based on State Enterprise "Inforesurs" (n.d.)*

The proposed model for organising career guidance activities for pedagogical specialities at a university of life sciences proved effective. Thanks to the systematic involvement of academic and teaching staff, and the combination of informational, consultative, and educational work, there was an increase in both quantitative and qualitative indicators of enrolment, as well as an improvement in applicants' awareness of the career choices.

**Generalising methodological advice for stakeholders in the educational process regarding the implementation of career guidance tasks for pedagogical specialities at life sciences universities**

The experience of the Pedagogy Department of NULES of Ukraine, along with relevant scientific literature, enables the formulation of such advice, verified by many years of practice in the educational services market. The education market defines a straightforward model of relations – client-orientedness – therefore, regardless of the applicant's temperament, it is essential to demonstrate marked politeness and respect, to be able not only to listen but also to hear the applicant, and to respond promptly to the moods and needs.

It is worth applying the rule of social proof. For instance, when a car dealer wishes to sell a vehicle quickly, the viewing for several clients is arranged simultaneously to create a sense of demand (Cialdini, 2009). In career guidance work, attention is often paid solely to the number of students ultimately enrolled, overlooking the number of applications submitted. However, the number of applications for a particular programme serves as an indicator of demand and liquidity. Hence, the volume of submitted applications is of significance. The outcomes of previous admission campaigns are valuable, due to being displayed on the informational platforms "Yedbo-vstup" and "Vstup-info". When applicants crowd near the document submission window for a specific programme, this serves as additional evidence of adherence to quality standards in the provision of educational services.

It is advisable to apply the rule of reciprocity. When prospective students attend an Open Day or visit a specific department, it is desirable that these students receive handouts. It is worth providing brochures, textbooks, manuals, as well as offering refreshments such as tea and coffee, or organising a free campus tour. Investing time and effort in visitors reflects both hospitality and commitment. On one hand, this demonstrates courtesy and full dedication; on the other, it operates on

a psychological level. When individuals observe genuine effort and engagement, the individuals are more likely to respond positively and less inclined to refuse. Furthermore, consistent diligence and integrity in such interactions can influence how applicants expect to be treated in the future.

It is recommended to emphasise all attractive aspects of the educational offering and to downplay or postpone discussion of any potential shortcomings. It is advisable to focus on the advantages of studying the programme – such as the ecologically clean location of the institution, healthy dining options, comfortable living conditions, strong material and technical base (computers, smart boards, multimedia, virtual reality rooms, laboratories, a botanical garden, dedicated teaching staff, and opportunities for distance and dual education). At the same time, it is unnecessary to rush to disclose disadvantages, as these are typically highlighted by competitors.

It is essential to cultivate the principle of "authority" in career guidance for pedagogical specialities at life sciences universities. Career consultations and applicant support should not be the sole responsibility of secretaries, laboratory assistants, and PhD students – professors, associate professors, and senior academic staff should also be involved. Ideally, these senior figures should serve directly as agents of career guidance. The words of individuals with recognised authority carry significant weight and are often highly persuasive (Milgram, 2009). It is advisable, during university tours, to introduce applicants and the parents to the dean, the head of department, and – if possible – the rector or vice-rector, whose endorsement adds weight to the proposal. Reference may be made to the obedience to authority explored in S. Milgram's (2009) experiment. One illustrative case concerns a female applicant who now studies at the Faculty of Humanities and Pedagogy of NULES of Ukraine. Despite scoring 173 on the National Multi-Subject Test (NMT) and receiving a recommendation for state-funded admission to a university in Kyiv, an applicant chose to pursue the "Professional Education" programme on a contract basis at another institution. When questioned about the decision – which ran counter to parental preference for free education – the applicant explained: "The secretaries at the admissions office there were simply going through the motions and speaking in a dismissive tone. The secretaries left a discouraging impression, as if being tired of even seeing me".

In the same context of promoting "authority" within career guidance and promotional work, it is necessary to provide examples of successful careers in the advertised field – such as those of academician of the NAES of Ukraine S.M. Nikolaienko, corresponding member O.I. Shcherbak, or former Chairmen of the Verkhovna Rada of Ukraine O.O. Moroz and I.S. Plyushch. It is also helpful to refer to the success stories of employers, or of distinguished professors and associate professors from the department, whose names and achievements are well known.

It is advisable to apply the principle of "scarcity" by communicating to applicants that the educational service on offer is limited in number and available only for a short time. Consequently, quick action is required. As with forbidden love in Romeo and Juliet, the allure of samizdat literature in Soviet times, or time-limited promotional offers, scarcity stimulates interest and urgency. These strategies are consistent with the principles outlined by R. Cialdini (2009).

It is crucial to retain contact information following every interaction with an applicant. Each career guidance event – whether a brief presentation, group meeting with a class or course, or individual consultation – should conclude with the applicant completing a Google Form via a QR code. In this way, prospective students become affiliated with the institution and the department, gaining access to free consultations, masterclasses with professors and associate professors, and opportunities to attend lectures or seminars as guest participants in subjects of interest. Moreover, a department-level database of potential applicants is established. From this point onwards, individual work with the applicant begins, supported by a dedicated career consultant from the department.

## Conclusions

The system of career guidance for pedagogical programmes at life sciences universities is presented in the article through modelling and visualised as a graphical representation of the studied phenomenon. The system has specific features determined by the preparation of teaching staff to work with future professionals in bioeconomic professions of the "human-nature" type. The system (model) is based on scientific and organisational principles, includes interrelated components (goal-oriented, methodological, content-related, operational, result-oriented, and control-corrective), which function in unity and ensure synergy of goals, tasks, approaches, principles, content, pedagogical conditions, forms, methods, tools, and actors (teachers, parents, career consultants, students, employers) through structured, algorithmic cooperation.

This system is based on systematic (functional unity of elements), competence-based (development of key and professionally significant competencies in students for future employment), person-oriented (helping each applicant find the own professional path), and axiological (internalisation of professional, civic, and self-realisation values) approaches. These are implemented alongside the principles of voluntariness, individualisation, complexity, consistency, continuity, scientific integrity, and accessibility.

The content of this career guidance system is rooted in values and assumptions that socio-economic professions of the "human-human" type are both promising and prestigious, because of involving emotional interaction between thinking systems – a skill increasingly demanded in an era of AI, robotics, and digital transformation. The model was implemented through clearly defined stages corresponding to the epistemology and component structure of the individual. The algorithm included: stage 1 – use of verbal methods; stage 2 – activation of interest in pedagogical professions; stage 3 – testing of professional skills; stage 4 – reflection on career self-determination.

The system also included performance monitoring mechanisms to track career guidance activity among department staff and measure success based on the number of applicants engaged, supported, and ultimately enrolled. Over five years, dynamic data on enrolment in pedagogical programmes confirmed the effectiveness of the proposed model – despite objective challenges such as the pandemic, war, and mass youth migration abroad.

The study also summarised practical recommendations for career guidance stakeholders, including: applying social proof, cultivating reciprocity, showcasing appealing aspects of pedagogical study, using authority, applying the scarcity principle, obtaining applicant contact information, and forming a database of prospective students. Future research may involve expanding this model to other academic programmes, adapting it to dual education systems and digital transformation, and developing informational-analytical platforms for monitoring, forecasting, and individualising applicant trajectories based on potential, labour market needs, and societal demand.

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## Conflict of Interest

None.

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# Система організації профорієнтаційної роботи на педагогічні спеціальності університетів наук про життя

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**Анотація.** Метою статті було розробити моделі (системи) організації профорієнтаційної роботи на педагогічні спеціальності університетів наук про життя. У статті наводились відомості щодо створення та перевірки ефективності системи профорієнтаційної роботи на педагогічні спеціальності аграрних та природоохоронних університетів, що розглядалося як цілісна єдність вибудувана на науково-організаційних засадах із впорядкованими складовими елементами, що перебували між собою у тісних зв'язках і залежностях, формуючи відповідну функціональну єдність. Встановлено, що створена система мала специфічні особливості, оскільки забезпечила відбір здобувачів на педагогічні спеціальності університетів наук про життя, завданням яких була підготовка фахівців біономічних професій типу «людина-природа». Акцентовано, що модель охоплює цільовий, методологічний, змістовий, операційний, результативний та контрольно-корекційний компоненти, що дозволяло досягти синергії мети, завдань, підходів, принципів, змісту, педагогічних умов, форм, методів, засобів, заходів суб'єктів (учителі, батьки, профконсультанти випускових кафедр, студенти, роботодавці) у рамках впорядкованої, алгоритмічної співпраці. Модель базувалася на системному, компетентністному, особистісно-орієнтованому та аксіологічному підходах, реалізувалася алгоритмічно із поетапним застосуванням форм, методів, прийомів, засобів, заходів у відповідності із покомпонентною структурою особистості. Проаналізовано, що впроваджений алгоритм передбачав застосування вербальних методів, методів актуалізації потреб вибору педагогічної професії в університетах наук про життя, апробацію професійних умінь, навичок та рефлексивні методи професійного самовизначення. Система передбачала механізми контролю її результативності, що дозволило відслідковувати динаміку наборів та показники профагітаційної активності суб'єктів освітнього процесу, за допомогою чого доведено її ефективність яка виявилась у динаміці поданих заяв та фактично зарахованих на навчання студентів з 2020 по 2024 роки, незважаючи на об'єктивні ускладнюючі фактори, такі як пандемія коронавірусу, війна, значна міграція молоді за межі країни. Вказано, що ефективність реалізації системи організації профорієнтаційної роботи на педагогічні спеціальності університетів наук про життя залежить від забезпечення виокремлених педагогічних умов та дотримання суб'єктами профагітаційної роботи відповідних методичних порад

**Ключові слова:** модель системи профорієнтації; інструменти професійного орієнтування; діагностика професійної спрямованості вступників до педагогічних програм; учасники процесу профорієнтації; консультанти з вибору професії; механізми контролю кількісних показників набору на педагогічні спеціальності