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INNOVATING CAREER SUPPORT IN HIGHER EDUCATION FOR PERSONALIZED PROFESSIONAL DEVELOPMNET

Abstract. This article examines the current challenges and possibilities in preparing future professionals within higher education, paying particular attention to the changing educational environment of Kazakhstan. It argues that universities must align their curricula with the fast-shifting demands of the global labor market, where not only technical knowledge but also career planning and personal competencies are increasingly valued. The discussion highlights the growing significance of soft skills such as adaptability, problem-solving, and communication as key elements of employability, on par with academic training. Drawing on both national and international perspectives and informed by concepts of globalization and interconnected labor markets, the study compares how different systems approach career support. The analysis shows that while technical expertise remains necessary, modern employers often prioritize creativity, flexibility, and interpersonal strengths. By bringing together findings from pedagogical research and policy reports, the article stresses the need to embed career education and soft-skills development into university programs. It concludes that the professional success of graduates depends not only on specialized training but also on the systematic cultivation of transferable competencies, which together will help them stay resilient and competitive in an unpredictable global economy.

Keywords: higher education, professional development, career planning, soft skills, employability, global labor market, educational reform, competitiveness of graduates

Introduction

Higher education today is developing in a context of constant change, where the ability of universities to keep pace with the global labor market has become a defining challenge (Klyachko & Tokareva, 2025). Across Kazakhstan, as well as internationally, many initiatives have aimed to strengthen career services and professional development programs for students. Yet a clear gap remains between what is prescribed in theory and what students actually experience in practice. Digital platforms such as LinkedIn or Handshake, for example, provide useful tools for job searching and skills training, but they typically address only fragments of the wider career journey. For many students, this leaves their development fragmented and lacking the sustained, personalized guidance needed throughout the university years.

Career counseling at Kazakhstani universities, though expanding, is still uneven in quality and often not anchored in robust theoretical frameworks. As a result, the support provided is limited in both personalization and long-term impact. Recognizing this, our study makes use of the PRISMA methodology (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) to ensure that our review of both national and international practices is systematic and transparent (Sarkis-Onofre et al., 2021). By applying this approach, we were able to carefully trace inclusion and exclusion criteria, highlight effective models, and identify the specific shortcomings most relevant to the Kazakhstani context.

The importance of such research is underscored by the fact that employers continue to raise expectations for graduate competencies. For many students, the university period is

decisive: it is a time when career aspirations are reshaped, skills are tested, and professional goals are refined (Boluchevskaya, 2010). Students who lack clarity in career orientation often face greater risks of academic difficulties, lower motivation, and even early withdrawal from studies (Krasil'nikova, 2024). In the context of an increasingly digital economy, universities are thus under pressure to find innovative approaches technological as well as pedagogical that can support students more effectively (Zhang, 2024).

One of the most persistent problems is the divide between academic research on career development and the day-to-day practices of career advisors. Investigations of dozens of universities have shown that many programs are not grounded in current theoretical concepts (Sampson et al., 2014). Often, career courses are designed to reach as many students as possible, but with limited resources this broad coverage can come at the expense of individualization. Digital tools, if used thoughtfully, offer one way of closing this gap by providing students with personalized, research-informed pathways that can be scaled across entire institutions.

Research also shows that targeted initiatives in career development do make a difference. Still, students continue to report barriers such as uncertainty in career choices or a lack of practical experience (Bakhtin, 2022). This highlights the importance of asking not only whether programs are available, but how well they are designed, which forms of support are most effective, and how digital solutions can help expand access.

Existing approaches to evaluation also fall short. Quantitative indicators, while useful for tracking numbers, do little to explain the deeper mechanisms that shape students' choices or persistence. This imbalance is reflected in Social Cognitive Career Theory (SCCT), where emphasis has traditionally been placed on individual factors such as self-efficacy, while contextual influences like barriers and institutional support have received less attention (Lent et al., 2000). A more complete understanding requires consideration of both.

Literature also points to the decisive role of family support, financial circumstances, and the educational environment itself factors often overlooked in practice (Le et al., 2020). Participation in research, mentoring, or project-based learning can significantly enhance students' confidence and sense of direction (Lin et al., 2016), while simple community engagement appears to have less impact. These findings suggest the potential value of digital platforms that scale up proven practices such as mentorship and research involvement, providing structured yet flexible opportunities for growth.

Taken together, these insights demonstrate both the urgent need for stronger career support and the limitations of traditional approaches. Against this backdrop, the present study aims to analyze best practices and distill key requirements for a modern IT-based career counseling system. This work forms part of the project «Development and implementation of it solutions in the process of professional development and career counseling for students and graduates of higher education institutions» (Project IRN AP26194889), whose goal is to create a system that offers personalized, research-based, and accessible career planning tools, while also automating and strengthening the career counseling infrastructure within universities.

Research strategy and methods

To explore the challenges of career counseling and professional development in higher education, we adopted a systematic approach that allowed us to examine the field comprehensively and identify both achievements and gaps. The methodology combined two main components: a systematic literature review, guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework (Sarkis-Onofre et al., 2021), and a comparative analysis of existing IT-based solutions.

To strengthen the methodological foundation of this study, we carefully connected each research objective with the corresponding stage of the applied methods. The literature review

was conducted using the PRISMA approach, which provided a transparent process for selecting articles, applying inclusion and exclusion criteria, and synthesizing findings. A comparative analysis was then used to evaluate the functionality and theoretical basis of existing IT platforms, helping us assess their relevance to the Kazakhstani higher education context. To better understand the perspectives of different stakeholders, we applied empirical methods such as surveys, focus groups, and interviews with students, alumni, faculty, and employers. In addition, established theoretical models Holland's RIASEC, Social Cognitive Career Theory (SCCT), and Career Construction Theory served as the conceptual framework for developing an IT-based model of career counseling. By linking the objectives with the methods in this structured way, the study ensures both rigor and reliability, while also highlighting its practical and theoretical contributions (MacLeod et al., 2022).

Systematic Literature Review: PRISMA Application

The literature review was conducted to map the theoretical foundations of career development and highlight factors influencing students' professional self-determination. Our application of the PRISMA framework ensured a transparent and replicable process.

The search was conducted between October 2023 and February 2024 across several academic databases, including

Scopus, Web of Science, Google Scholar, and eLibrary.ru. Search terms were formulated in English and Russian, including: «career counseling», «student professional self-determination», «social cognitive career theory», «IT in education», «EdTech» and «student self-efficacy».

Our search initially yielded 342 sources. After removing duplicates, 289 articles remained. These were screened based on titles and abstracts, leading to the exclusion of 197 sources that were not directly relevant to career support in higher education. The full texts of the remaining 92 articles were assessed for eligibility.

The following inclusion criteria were applied:

- Published in a peer-reviewed journal between 2010 and 2024.
- Focused specifically on higher education students or graduates.
- Directly addressed career counseling, professional development theories, or digital support tools.

Exclusion criteria included:

- Studies focused on secondary or vocational education.
- Articles where career development was not the primary topic.
- Editorials, book reviews, and non-peer-reviewed conference proceedings.

After this screening, 48 sources were selected for the final qualitative synthesis. These sources were grouped into three thematic clusters for analysis:

1. Foundational Theories of Career Development: Articles discussing core models like Holland's RIASEC, SCCT, and Career Construction Theory.
2. Implementation and Practice: Studies examining the application of career support programs, including challenges and success factors.
3. Digital Innovations in Career Counseling: Research focused on EdTech platforms and IT solutions in higher education.

This systematic process allowed us to identify the most influential theoretical frameworks and pinpoint specific gaps between theory and practice, which directly informed our analysis.

Comparative Analysis of IT Solutions

Alongside the literature review, the study examined existing digital platforms that support career planning. The goal was not simply to describe available tools but to assess how

effectively they align with theoretical models of career development and how adaptable they may be to the Kazakhstani context.

This analysis focused on widely used international platforms, including LinkedIn, Coursera for Campus, and Handshake, as well as tools such as Big Interview and CareerHub. In addition, local and national EdTech projects in Kazakhstan were considered. Each platform was analyzed according to its target audience, key features, theoretical grounding, and strengths and limitations.

Specific Objectives

The research was guided by several concrete objectives:

1. To conduct a systematic literature review of career counseling theories, IT-supported practices, and their implementation in both Kazakhstani and international settings.
2. To identify gaps between higher education programs and the requirements of the labor market, with a special focus on the role of soft skills and individualized career planning.
3. To analyze the strengths and shortcomings of leading IT platforms and evaluate their potential for adaptation in Kazakhstan.
4. To collect empirical insights from students, graduates, faculty, and employers through surveys, focus groups, and interviews, providing a well-rounded understanding of stakeholder expectations.
5. To design a digital model for career counseling that incorporates recognized theories Holland's RIASEC, Social Cognitive Career Theory, and Career Construction Theory translating them into practical tools that are both accessible and scalable.
6. To propose strategic recommendations for implementation, including approaches to monitoring, evaluation, and impact assessment on graduate employability.

By combining systematic literature analysis with comparative study of digital platforms, this methodology lays a strong foundation for developing an IT solution that is both evidence-based and responsive to the needs of Kazakhstani universities.

In this publication, we focus primarily on the initial stages of the project, namely the systematic literature review and the comparative analysis of existing IT-based career counseling solutions. These steps have laid the theoretical and methodological foundation for identifying key gaps and requirements for future model development. The empirical stage (surveys, focus groups, and interviews) as well as the design of an integrated digital career counseling model and the formulation of strategic monitoring and evaluation recommendations are planned for subsequent phases of the research and will be presented in forthcoming publications.

Summary of Literature Review

The systematic review of 48 selected sources revealed several key findings that shape our understanding of modern career support. The analysis, structured around our three thematic clusters, identified dominant theoretical approaches, practical implementation gaps, and the current state of digital solutions.

Foundational Theories in Career Development

Our analysis confirmed that three frameworks are most influential in the field:

Holland's Theory of Vocational Personalities, Social Cognitive Career Theory (SCCT), and Career Construction Theory.

- Holland's Theory remains widely applied due to the practicality of its RIASEC model, which aligns personality types with work environments to guide career choice. Its value lies in providing a clear starting point for student self-exploration.

- Career Construction Theory offers a contemporary perspective, viewing careers as an ongoing process of adaptation rather than a linear path. Its focus on narrative and meaning making is particularly relevant for preparing students for an unpredictable labor market.

- Social Cognitive Career Theory (SCCT), developed by Lent, Brown, and Hackett, was the most frequently discussed framework in recent literature. Research consistently highlights self-efficacy as a powerful predictor of career intentions and persistence. However, our review also revealed that contextual factors like institutional support and external barriers are less studied, indicating a significant research gap.

Gaps in Implementation and Practice

A recurring theme across 18 of the analyzed articles was the disconnect between theory and the actual practice of university career services. Many career programs are designed for broad reach but lack personalization and are not grounded in established theoretical models (Sampson et al., 2014). Furthermore, evaluations of these programs often rely on quantitative metrics (e.g., participation numbers) that fail to capture the deeper impact on students' confidence and decision-making. This is especially true in contexts like Kazakhstan, where family and financial circumstances strongly influence career choices, yet are often overlooked by formal support systems (Le et al., 2020).

Digital Innovations and Their Limitations

The review of digital tools showed a market dominated by solutions focused on specific, isolated stages of the career journey, such as job searching (LinkedIn), skills training (Coursera), or interview preparation (Big Interview). While these platforms are useful, they lack the integrated, holistic support that guides a student from initial self-discovery to long-term professional growth. This fragmentation represents a major gap in the current EdTech landscape, reinforcing the need for a comprehensive, theory-grounded platform.

The synthesis of these findings leads to a clear conclusion: effective career support requires an integrated approach that combines validated diagnostics, personalized guidance, and meaningful, confidence-building experiences, all within a unified digital ecosystem.

The systematic review revealed several key theoretical approaches that continue to shape research and practice in student career development. Three frameworks in particular Holland's Theory of Vocational Personalities, Social Cognitive Career Theory (SCCT), and Career Construction Theory emerged as the most influential. Each provides distinctive insights, yet together they offer a complementary foundation for supporting students in their professional self-determination.

Holland's Theory. Since its introduction in 1959, Holland's model has remained widely applied in both research and practice because of its clarity and practicality. The theory argues that career choice is most successful when there is alignment between an individual's personality type and their work environment. Holland described six personality/work environment types, known by the RIASEC acronym: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Most people combine elements of several types, and recognizing this blend can help students identify diverse career directions. The model emphasizes three key dimensions congruence, differentiation, and consistency that shape professional identity and make decision-making easier (Brown & Lent, 2012; Rodionov & Borisova, 2021).

Career Construction Theory. This perspective views career not as a linear progression but as a process of ongoing adaptation (Brown & Lent, 2012). Central to this theory is the idea of narrative related to the fact that individuals actively construct meaning from their professional experiences and use these reflections to guide future decisions (MacLeod et al., 2022). Counselors, in this approach, help students articulate their personal stories, motives, and adaptive strategies. While it has often been applied to mid-career professionals, its focus on adaptability makes it equally valuable for preparing undergraduates to enter a labor market defined by rapid technological and economic change (Hirschi & Koen, 2021).

Social Cognitive Career Theory (SCCT). Developed by Lent, Brown, and Hackett, SCCT extends earlier models by emphasizing the interaction between personal beliefs, expected

outcomes, and goal setting (Rodionov & Borisova, 2021; Wang et al., 2022). It draws on Bandura's broader social cognitive framework (Bandura, 1986), highlighting how personal factors, behaviors, and environmental conditions influence one another. Research grounded in SCCT consistently shows that self-efficacy is a powerful predictor of students' educational and career intentions, directly affecting persistence and success (Bandura, 1997; Conklin et al., 2013; Jiang, 2016). Yet there are still gaps in understanding how contextual influences such as institutional support, family resources, or financial constraints interact with self-efficacy and outcome expectations (Lent et al., 2000). Scholars increasingly call for more attention to how learning experiences, mentoring, and project involvement shape career choices (Fouad et al., 2010; Olson, 2014).

The review also exposed imbalances in both research and practice. Too often, quantitative methods dominate evaluations of career programs, producing numerical indicators without explaining the underlying mechanisms of change. Similarly, while self-efficacy has been studied extensively (Bandura, 2012; Yamani & Almazroa, 2024), external barriers and forms of support remain less developed in theory and underutilized in practice (Deemer et al., 2014; Thiem & Dasgupta, 2022). This is especially problematic in contexts such as Kazakhstan, where students' career choices are strongly influenced by family expectations, financial circumstances, and institutional resources (Lent et al., 2015; Virtic & Sorgo, 2022).

Taken together, these findings suggest that effective career counseling requires a more integrated approach, one that combines validated diagnostics, attention to contextual factors, and opportunities for students to engage in meaningful, confidence-building experiences. Such insights provide the conceptual backbone for the IT solution proposed in this project.

Integration into IT Solutions

The comparative analysis of existing digital platforms shows that the global market for career development tools is dominated by solutions designed for specific purposes. Most platforms concentrate on one stage of the pathway such as job searching, skills training, or interview preparation rather than offering holistic, continuous support. This fragmentation leaves students without sustained guidance across their academic and early professional journeys.

Findings from platform analysis indicate that LinkedIn excels in networking and content but offers limited deep personalization attuned to local labor markets. Coursera for Campus provides high-quality courses and credentials yet often lacks mentoring and tight integration with institutional ecosystems. Handshake connects students with employers primarily in the United States while tools such as Big Interview and CareerHub add specialized functions focused on single stages. Local EdTech pilots in Kazakhstan are sensitive to national labor needs but face scalability and global-integration challenges. Viewed together, widely used tools are practical and popular, yet they typically operate without explicit theoretical grounding and with limited personalization.

Table 1*Comparative Analysis of IT Platforms for Career Development*

Platform	Target Audience	Key features	Theoretical foundations	Strength	Weakness
LinkedIn Learning / Career	Students, graduates, professionals	Job search, professional networking, skills courses, AI-based recommendations	Implicit (market-driven, not explicitly theory-based)	Global network, wide content base, integration with employer needs	Limited personalization; focus on general skills, not tailored to local labor markets
Coursera for Campus	Universities, students	Online courses, certificates, skill diagnostics, career guidance modules	Competency-based learning models	Access to top universities, flexibility, affordable certification options	Courses often generic; limited mentoring/personal support
Handshake	Students and employers (mainly US universities)	Job/internship listings, employer-student matching, event management	Employability & career readiness models	Strong employer network, direct connection to universities	Limited global coverage; oriented mostly towards US market
Big Interview	Students, job seekers	AI-driven mock interviews, question banks, structured feedback	Social-cognitive career theory (applied)	Improves interview readiness, personalized training	Focuses only on interview stage; lacks broader career development functions
CareerHub	Universities, career centers	Career portal, job boards, event management, counseling support	Holistic student development models	Strong institutional integration, customizable for HEIs	Less known globally; expensive for smaller institutions
Local/National EdTech platforms (e.g., Kazakhstan EdTech pilot projects)	Students, graduates in specific regions	Diagnostics, LMS integration, career advising tools	Contextualized to national labor market needs	Adapts to cultural & labor specifics, government recognition	Limited scalability; often lack global employer connections

This framework bridges psychology, pedagogy, and IT design, operationalizing complex constructs such as self-efficacy and person environment congruence into system requirements. The results summarized in Table 1 show that the market is dominated by utilitarian solutions focused on only one stage of the career pathway (job search or training). There is a clear gap for a comprehensive, integrated platform that would accompany students from self-exploration to employment, grounded in scientific models and offering deep personalization.

Our synthesis of theoretical insights and platform comparisons points to four essential requirements for an effective IT solution in the Kazakhstani higher education context:

1. Evidence-based diagnostics. A strong platform should begin with validated tools for self-discovery, drawing on established frameworks such as Holland's RIASEC model and

constructs from Social Cognitive Career Theory. Diagnostics are the basis for meaningful personalization.

2. Dynamic personalization. Career pathways should not be presented as fixed menus of courses or activities. Instead, the system must build adaptive plans that evolve alongside the student, reflecting the constructivist view of career development as a continuous narrative.

3. Integration of high-impact practices. Mentoring, participation in research projects, and opportunities for applied learning are consistently shown to strengthen self-efficacy (Quinlan & Renninger, 2022). An effective platform should therefore facilitate mentor matching, project participation, and targeted networking, rather than relying solely on general training content (Lin et al., 2016).

4. Creation of a unified ecosystem. Current solutions are fragmented. What is needed is a single environment that links diagnostics, learning, experience-building, and job search into a seamless process, guiding students step by step from self-exploration to employment.

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The formulated requirements represent a bridge between psychological career theories and principles of information-systems design. The theoretical significance of this work lies in translating complex constructs such as self-efficacy and congruence into concrete functional requirements, thereby creating a scientific foundation for future developments in EdTech. The practical significance and innovative value lie in shifting from utilitarian job-placement support to holistic, proactive management of students' professional development. A platform built on these requirements should enhance awareness, self-efficacy, and, as a result, employability and competitiveness. For universities, such an IT solution offers a means to scale high-quality career support and to make data-driven management decisions.

It is important to emphasize that this article provides an analytical foundation and a conceptual framework. The next step involves developing a minimum viable product (MVP), piloting it in educational settings, and empirically assessing its impact on students' career outcomes.

Conclusion

In an era of rapidly evolving labor market demands and increasing complexity in students' career decision-making, the role of universities in providing structured and comprehensive career support has become more critical than ever. This study set out to bridge theoretical frameworks, practical models, and digital innovations in order to define the essential requirements for next-generation IT-based career counseling systems in higher education.

The findings underscore several important insights. First, the enduring relevance of established psychological theories Holland's vocational typology, Career Construction Theory, and Social Cognitive Career Theory remains central to understanding and supporting students' career development. These frameworks provide valuable guidance on how students form career intentions, navigate uncertainty, and build self-efficacy. Second, comparative analysis of existing digital platforms revealed that while many tools deliver useful functions, they often remain fragmented, narrowly focused, and insufficiently anchored in theory.

Synthesizing these insights, the study advances four interconnected design principles for future IT systems: (1) scientifically validated diagnostics, (2) adaptive personalization of learning and career pathways, (3) integration of mentoring and experiential learning, and (4) the creation of a holistic ecosystem uniting career education, skills development, and

employment opportunities. Together, these principles form the foundation for a platform capable of supporting students across all stages of professional development, ultimately strengthening their career readiness and competitiveness.

The contribution of this research is twofold. Theoretically, it operationalizes complex constructs of career psychology into concrete requirements for educational technologies. Practically, it outlines the basis for designing IT-driven career counseling models that go beyond job placement to foster lifelong professional growth.

At the same time, this study has certain limitations. It primarily focuses on theoretical and methodological analysis and a comparative review of existing solutions; the empirical component (surveys, interviews, focus groups) will be addressed in subsequent stages of the project. In addition, reliance on available literature and selected international practices requires further adaptation of conclusions to the Kazakhstani higher education context.

Future research will build upon these foundations by developing and piloting a prototype of the proposed IT model within universities, followed by empirical evaluation of its effectiveness. Such work will allow for testing practical applicability, identifying implementation challenges, and refining recommendations for broader integration. Ultimately, these steps will demonstrate how digital solutions can enhance not only individual student outcomes but also the institutional capacity of universities to provide scalable, evidence-based, and future-oriented career support.

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Conflict of Interests

Conflict of Interest Statement The authors declare no potential conflicts of interest regarding the research, authorship, or publication of this article.

Author Contributions

Ainash Kudysheva: Conceptualization, Methodology, Writing – Original Draft Preparation, Supervision, Editing. Askar Azhenov: Theoretical Analysis, Literature Review, Writing – Reviewing and Editing. Aizhan Temerbayeva: Project Administration, Resources, Literature Review, Writing – Reviewing and Editing. Indira Saparbekova: Writing – Review and Editing.

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