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EDITORIAL

Launching the *Central Asia Higher Education Review*: Creating a Scholarly Home for Higher Education Research in Central Asia

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The publication of the inaugural issue of the *Central Asia Higher Education Review* represents an important milestone in the development of higher education scholarship on Central Asia. For many years, I have observed both the remarkable transformation of higher education across the region and the growing community of scholars dedicated to studying these changes. Yet despite this momentum, opportunities to publish, exchange ideas, and build sustained scholarly dialogue focused specifically on Central Asian higher education have remained limited. The establishment of this journal is a response to that need.

Higher education has become one of the most dynamic policy sectors in Central Asia. Universities are expanding access, pursuing international partnerships, strengthening research capacity, embracing digital technologies, and responding to rapidly changing economic and societal expectations. These developments are taking place within contexts shaped by Soviet institutional legacies, nation-building projects, globalization, demographic change, and increasing international mobility. Consequently, higher education in Central Asia offers a rich setting for understanding how global reform agendas are interpreted, negotiated, and adapted within diverse national and institutional environments.

Although research on the region has grown substantially during the past decade, much of it remains dispersed across journals in education, public policy, sociology, economics, and regional studies. Scholars working on similar questions often publish in different disciplinary communities with limited interaction, while important studies published locally frequently receive little international visibility. This fragmentation has slowed the development of cumulative knowledge and broader scholarly conversations.

The *Central Asia Higher Education Review* seeks to contribute to a more connected research community. Rather than serving simply as another publication outlet, the journal aspires to become an intellectual meeting place where diverse perspectives, methodological approaches, and disciplinary traditions intersect. I hope it will encourage dialogue among researchers within Central Asia while also strengthening connections with the international higher education research community.

At the same time, this journal begins from an important premise: Central Asia should not be viewed merely as a peripheral setting in which established theories developed elsewhere are tested. The region provides valuable opportunities to refine existing conceptual frameworks, challenge dominant assumptions, and generate new theoretical insights. Questions surrounding post-socialist transformation, multilingual education, internationalization, governance reform, academic work, quality assurance, equity, research development, and institutional change are not only regional concerns; they speak directly to broader debates in comparative and international higher education. Scholarship emerging from Central Asia therefore has much to contribute to global knowledge production.

Another aspiration for the journal is to support the next generation of researchers. Early-career scholars in Central Asia often face significant challenges in navigating international publishing, developing research networks, and accessing constructive peer review. A strong scholarly community depends upon creating opportunities for mentorship, collaboration, and rigorous yet supportive academic dialogue. I hope the journal will become a venue where emerging and established scholars alike engage in conversations that strengthen both individual scholarship and the field as a whole.

This inaugural issue reflects the diversity and promise of contemporary higher education research in Central Asia. The articles address different countries, institutions, and research questions, employing a range of methodological approaches to examine issues of pressing importance for policymakers, institutional leaders, academics, and students. Collectively, they illustrate the breadth of scholarly inquiry developing across the region while demonstrating that research on Central Asian higher education increasingly contributes to international discussions rather than existing at their margins.

The launch of a scholarly journal is never the work of a single individual, even when it begins with a single vision. I extend my sincere gratitude to the authors who entrusted the *Central Asia Higher Education Review* with their research for this inaugural issue. I am equally grateful to the reviewers whose thoughtful evaluations have strengthened each manuscript and helped establish the high scholarly standards to which the journal is committed. My appreciation also goes to the members of the Editorial Board, whose expertise, encouragement, and willingness to contribute their time have been essential in bringing this journal from an idea to reality.

As the founding editor, I view this inaugural issue not as the culmination of a project but as its beginning. The journal will undoubtedly evolve alongside the rapidly changing higher education landscape of Central Asia. My hope is that it becomes a trusted venue for rigorous scholarship, thoughtful debate, and meaningful collaboration—one that amplifies voices from the region while welcoming contributions from scholars around the world who seek to better understand higher education in Central Asia and its place within the global academic community.

I am delighted to welcome readers to the first issue of the *Central Asia Higher Education Review* and invite you to join this scholarly conversation as authors, reviewers, readers, and collaborators.

POLICY BRIEF PAPER

Recruitment Agents in International Higher Education: An Ambivalent Actor

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Abstract: This paper examines the ambivalent role of international student recruitment agents in the rapid internationalization of higher education in Georgia. Drawing on the original dataset and national statistics, the study analyzes how recruitment agents have become central intermediaries in attracting international students, particularly to private medical programs. While agents facilitate access to higher education by providing linguistic, cultural, and procedural support, especially for students with limited social capital, their commission-based model also introduces significant ethical and academic risks. The Georgian case illustrates how recruitment practices can become highly commercialized in contexts of limited regulation, prioritizing volume and revenue over academic fit and quality assurance. The paper further discusses the implications for emerging education hubs in Central Asia, notably Kazakhstan and Uzbekistan, where similar dynamics are unfolding. It argues for nuanced, student-centered governance frameworks that recognize recruitment agents as indispensable yet risky actors in international higher education.

Keywords: ambivalence, corruption, Georgia, higher education, international agents

აბსტრაქტი: ნაშრომი საქართველოში საერთაშორისო სტუდენტების მოზიდვის აგენტების ორმხრივ როლს განიხილავს უმაღლესი განათლების სწრაფი ინტერნაციონალიზაციის პირობებში. პირველად მონაცემებსა და ეროვნულ სტატისტიკაზე დაყრდნობით, კვლევა აანალიზებს, თუ როგორ იქცნენ რეკრუტირების აგენტები საერთაშორისო სტუდენტების მოზიდვის მთავარ დამაკავშირებელ რგოლად, განსაკუთრებით კერძო სამედიცინო პროგრამების შემთხვევაში. კვლევის შედეგები მიუთითებს, რომ აგენტები უცხოელი სტუდენტებისთვის უმაღლესი განათლების ხელმისაწვდომობას ზრდიან, განსაკუთრებით ენობრივი, კულტურული და ადმინისტრაციული მხარდაჭერის უზრუნველყოფის გზით. ეს მნიშვნელოვანია შეზღუდული სოციალური კაპიტალის მქონე სტუდენტებისთვის, რომელთაც საგანმანათლებლო სისტემებში ორიენტირება დამოუკიდებლად უჭირთ. თუმცა, რადგანაც აგენტთა საქმიანობა ფინანსური სარგებლის მიღებას ეფუძნება, იქმნება განათლების კომერციალიზაციის ტენდენციები და სერიოზული ეთიკური და აკადემიური რისკები ჩნდება.

საქართველოს შემთხვევა ცხადყოფს, რომ სუსტი და ფრაგმენტული რეგულაციების პირობებში საერთაშორისო სტუდენტების მოზიდვის პრაქტიკა შეიძლება

უკიდურესად კომერციალიზდეს, რის შედეგადაც რაოდენობრივი მაჩვენებლები და ფინანსური მოგება განათლების ხარისხზე მნიშვნელოვანი გახდეს. ნაშრომში მაგალითებად მოყვანილია ცენტრალური აზიის ისეთი განვითარებადი საგანმანათლებლო ცენტრები, როგორებიცაა ყაზახეთი და უზბეკეთი, რომლებშიც საქართველოს მსგავსი დინამიკა იკვეთება. კვლევა სტუდენტზე ორიენტირებული მმართველობის აუცილებლობაზე მიუთითებს. ამავდროულად, იგი რეკრუტირების აგენტებს საერთაშორისო უმაღლესი განათლების სისტემის მნიშვნელოვან, თუმცა პოტენციურად რისკის შემცველ აქტორებად განიხილავს.

საკვანძო სიტყვები: ამბივალენტობა, კორუფცია, საქართველო, უმაღლესი განათლება, საერთაშორისო სტუდენტების მოზიდვის აგენტები

Андатпа: Мақала Грузиядағы жоғары білімнің қарқынды интернационалдануы жағдайында шетелдік студенттерді тартумен айналысатын халықаралық рекрутинг агенттерінің екіұшты рөлін қарастырады. Бастапқы деректер жиынтығы мен ұлттық статистикаға сүйене отырып, зерттеу рекрутинг агенттерінің шетелдік студенттерді, әсіресе ақылы негіздегі медициналық бағдарламаларға тартуда қалайша негізгі делдалдарға айналғанын талдайды. Агенттер, әсіресе әлеуметтік капиталы шектеулі студенттерге тілдік, мәдени және рәсімдік қолдау көрсету арқылы жоғары білімге қол жеткізуді жеңілдеткенімен, олардың комиссияға негізделген жұмыс моделі елеулі этикалық және академиялық қауіп-қатерлер туғызады. Грузия мысалы реттеу тетіктері шектеулі жағдайда студент тарту тәжірибелері қаншалықты коммерцияланып кетуі мүмкін екенін көрсетеді және мұндай жағдайда академиялық сәйкестік пен білім сапасын қамтамасыз етуден гөрі студент санын көбейту мен табыс табу бірінші орынға шығады. Мақалада сондай-ақ Орталық Азиядағы, атап айтқанда Қазақстан мен Өзбекстандағы қалыптасып келе жатқан білім беру хабтары үшін ықтимал салдарлар талқыланады, өйткені бұл елдерде де осыған ұқсас үдерістер байқалуда. Авторлар халықаралық жоғары білім беру саласында рекрутинг агенттерін қажетті, бірақ тәуекелі жоғары қатысушылар ретінде мойындайтын, студентке бағдарланған сындарлы басқару тетіктерін қалыптастыру қажет екенін дәлелдейді.

Түйін сөздер: екіұштылық, сыбайлас жемқорлық, Грузия, жоғары білім, халықаралық агенттер

Introduction: Growth and Internationalization of Higher Education in Georgia

In recent years, Georgia has experienced a rapid expansion in its higher education sector. Between 2024 and 2025, total student enrolment increased by 5.6%, reaching 187,799 students (Geostat, 2025), a significant figure for a country with a population of approximately 3.7 million. Georgia is currently home to 62 higher education institutions—19 public and 43 private—many of which are relatively small and teaching-focused rather than research-intensive. Student admissions have also risen sharply, reaching a historic high of 50,128 in the 2022–2023 academic year and increasing further to 54,212 in 2024–2025 (Geostat, 2025). A central driver of this growth has been the rapid increase in international student enrolment. Since 2020, the number of international students in Georgian HEIs has tripled, reaching approximately 37,100 in 2024–2025, or nearly one in five students nationwide (Geostat, 2025). Georgia's appeal as a study destination is largely explained by affordable tuition fees, a relatively low cost of living, and its reputation as a safe

country (Gazdeliani, 2021). International students have thus become a crucial source of revenue and sectoral growth.

International Students and Institutional Concentration

International student enrolment in Georgia is highly concentrated by field of study and institutional type. The vast majority of international students are enrolled in medicine and other healthcare-related programs, while participation in non-medical disciplines remains limited. Medical programs in Georgia typically span six years, effectively integrating bachelor's and master's-level training within a single degree, in contrast to many international programs that last only three to four years. This extended duration generates additional tuition payments and provides more stable revenue streams for institutions.

Approximately 80% of international students are enrolled in private universities, reflecting the central role of private institutions in medical education, the widespread availability of English-taught programs, relatively flexible admissions procedures, and targeted international marketing strategies. Students from India constitute the largest group (around 55%), followed by growing cohorts from Jordan, Israel, and Sudan (Titvinidze, 2025). This pattern underscores how internationalization strategies can become narrowly oriented toward revenue-generating disciplines, raising broader questions about diversification, academic balance, and long-term sustainability. Recent policy initiatives may further reshape this landscape. Proposed reforms would introduce stricter regulation of international students—including language requirements, participation monitoring, admission quotas, and tighter residence-permit rules—while directing most international enrolment away from public universities and toward private institutions. Although framed by the government as a response to migration-management and oversight concerns, these measures have raised questions about university internationalization, institutional autonomy, and Georgia's future attractiveness as a regional education hub (Civil Georgia, 2026; On.ge, 2025).

The rapid growth of international enrolment has been accompanied by the expansion of international recruitment agencies, which now play a central role in student mobility to Georgia. An international recruitment agency can be understood as a specialized company—or a dedicated division within a larger corporation—that facilitates the recruitment of international students on behalf of higher education institutions. These agencies typically operate under formal contractual agreements with institutions and generate revenue through commissions or referral fees for applicants or enrolled students (Salem, et al., 2025).

Recruitment agents therefore occupy an inherently ambivalent position within higher education systems (Denisova-Schmidt et al., 2020; Reisberg and Altbach, 2023). Following Ledeneva (Ledeneva, 2018, 2024), we understand ambivalence as the coexistence of supportive and problematic functions within the same practice. Recruitment agents can serve as practical shortcuts that help students and universities navigate linguistic, cultural, and administrative barriers, thereby facilitating access and mobility. At the same time, these shortcuts may generate new risks, including opacity, dependency, conflicts of interest, and weak quality assurance. In this sense, recruitment agents should be viewed neither simply as indispensable partners nor as unethical

actors, but as powerful intermediaries whose benefits and risks must be governed together (Stecklow, et. al., 2016).

From a normative perspective, agents function as key facilitators of access. They often possess local knowledge, linguistic competence, and cultural familiarity that universities lack, particularly in contexts where official information channels or public advisory services are limited. They assist prospective students with applications, documentation, and visa procedures, thereby lowering barriers to international study, especially for students with limited social or cultural capital. From an institutional perspective, agents also provide a cost-effective recruitment strategy, allowing universities to scale international enrolment without investing in overseas offices or permanent staff. Given the financial significance of international students, agent-mediated recruitment has become integral to many institutional sustainability strategies.

From a critical perspective, however, this model introduces serious ethical and academic risks. Commission-based remuneration may incentivize recruitment volume over academic fit, potentially steering students toward programs or institutions that maximize agent income rather than student outcomes. Misleading marketing, exaggerated claims about employment or migration prospects, and opaque agent–institution relationships can further undermine trust (Curtis and Ellis, 2025). In some cases, inappropriate assistance with application materials may blur the line between legitimate support and academic misconduct, jeopardizing admissions integrity and student preparedness.

Georgia provides a particularly revealing illustration of this ambivalence. Our national study on academic and research integrity, conducted in 2025 across public and private higher education institutions in Georgia (Denisova-Schmidt and Sitchinava, 2027), reveals that, in a context of limited global visibility and underdeveloped internationalization strategies, recruitment agencies have frequently operated as de facto promoters for private universities rather than as independent advisors. The study draws on 34 in-depth, semi-structured interviews with senior faculty members (n=12), university administrators (n=11), and early-career researchers (n=11). Participants were recruited through purposive and snowball sampling. Interviews were conducted in Georgian—the native language of both the interviewer and the interviewees—to preserve linguistic and contextual nuance. Informed consent was obtained from all participants, and full anonymization was applied. Data were analyzed using thematic analysis. Although the broader project focused on academic and research integrity within Georgian higher education institutions, the role of recruitment agents emerged as an unexpected but important theme. One senior administrator explicitly identified their growing influence as a potential risk to the integrity of the sector. According to our respondents their influence increased substantially after 2022, when large numbers of international students—predominantly from India and the Middle East—transferred from Ukraine, many of them enrolling in medical programs (Turkmen et al., 2024). For these students, unfamiliar with the Georgian language and higher education system, agents became the primary intermediaries. *“Students mostly went to private universities [...] there are agents who bring these students, and it’s a big business, especially in the medical field”* as one senior interview partner revealed. On the one side, agents and universities facilitated the continuity of study for international students displaced from Ukraine, whose situation often remained under the radar of many decision-makers (Denisova-Schmidt and Marmilova, 2026; Ghimire, et. al., 2022).

By admitting these students at different stages of their studies, Georgian institutions enabled many of them to continue and complete their degrees. On the other side, recruitment increasingly resembled a highly commercialized “business,” with limited attention to academic level, preparedness, or quality assurance. This raises critical concerns about transparency, standards, and the dominance of financial incentives over educational values.

Implications for Central Asia: Kazakhstan and Uzbekistan

The Georgian case offers some important lessons for Central Asia, particularly Kazakhstan and Uzbekistan, both of which are rapidly expanding their higher education sectors and positioning themselves as regional education hubs. The comparison is grounded in striking statistical parallels. In Kazakhstan, the number of international students reached an all-time high of 35,075 in the 2025 academic year—an 11% increase from the previous year—with Indian students forming the largest cohort, at 9,959 students (Birbayeva, 2025). Similarly, in Uzbekistan, 37,200 foreign citizens visited for educational purposes in 2025, representing a 54.3% increase, while Indian enrollment in medical programs alone rose from 3,500 to over 10,000 in a single year (Martin, 2026). Like Georgia, these countries are witnessing rising international student enrolment, increasing private-sector participation, and growing reliance on recruitment intermediaries to access global markets. As internationalization accelerates, Kazakhstan and Uzbekistan face similar risks of over-commercialization, concentration in specific disciplines (such as medicine or engineering), and dependence on loosely regulated recruitment agents. The ambivalence observed in Georgia suggests that recruitment agencies should be treated as strategic actors requiring careful governance rather than neutral service providers. Without clear regulatory frameworks, accreditation mechanisms, and transparency requirements, recruitment practices may undermine academic quality, student welfare, and institutional credibility. At the same time, the Georgian experience also demonstrates that recruitment agents are likely to remain indispensable, particularly in regions where public advising infrastructure is weak and global competition for students is intensifying. For Central Asian systems, the challenge is therefore not whether to use recruitment agents, but how to govern them responsibly—through clear disclosure rules, shared ethical standards, institutional accountability, and student-centered oversight mechanisms.

Conclusion: Governing Ambivalence in International Recruitment

Recruitment agencies represent an ambivalent but powerful force in the internationalization of higher education. They can expand access, facilitate mobility, and support institutional growth, while simultaneously posing risks to academic integrity, equity, and quality assurance. The Georgian case illustrates how quickly recruitment can become commercialized in the absence of robust governance and how financial imperatives may override educational considerations. For emerging education hubs such as Kazakhstan and Uzbekistan, recognizing and addressing this ambivalence early is crucial. Rather than adopting binary positions that portray agents as either indispensable partners or inherently problematic actors, policymakers and universities should pursue nuanced, student-centered governance approaches. Transparent regulation, ethical oversight, and alignment with broader educational values are essential if recruitment agencies are to contribute positively to sustainable internationalization rather than undermine it.

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RESEARCH PAPER

**Intellectual Migration from Periphery to the West:
Exploring the Views of Kazakhstani Scholars Moving Abroad**

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Abstract This study examines the motivations behind academic migration among Kazakhstani scholars working abroad, using qualitative data from the #100KZGALYM project. Drawing on thematic analysis of 30 publicly available interviews, the research identifies political, economic, social, and professional push and pull factors shaping scholars' decisions to migrate. Findings reveal that migration is driven by structural issues within Kazakhstan's academic and institutional environment, including perceived lack of meritocracy, unstable funding, bureaucratic constraints, and limited demand for academic expertise. Conversely, destination countries offer academic autonomy, research infrastructure, professional integration, and higher quality of life. The study situates these findings within push-pull theory and broader migration frameworks, arguing that intellectual migration reflects systemic misalignment between national academic systems and global knowledge economies. The findings suggest that intellectual migration from Kazakhstan is shaped not only by economic factors, but also by institutional quality, academic freedom, and professional opportunities. The study therefore implies that policies aimed at reducing skilled emigration should prioritize strengthening merit-based academic systems, research infrastructure, institutional transparency, and opportunities for international academic engagement. By exploring scholars' lived experiences, this study contributes to understanding intellectual migration in post-Soviet contexts and offers recommendations for strengthening Kazakhstan's academic ecosystem.

Keywords: intellectual migration, brain drain, Kazakhstan, push and pull factors

Аңдатпа Бұл зерттеу шетелде жұмыс істейтін қазақстандық ғалымдардың академиялық көші-қонға итермелейтін себептерін зерттейді. Зерттеу деректері #100KZGALYM жобасы аясында жиналған материалдарға негізделген. Жалпыға қолжетімді 30 сұхбатқа тақырыптық талдау жүргізу арқылы ғалымдардың көшу туралы шешімдеріне ықпал ететін саяси, экономикалық, әлеуметтік және кәсіби итеруші (push) және тартушы (pull) факторлар анықталды. Зерттеу нәтижелері көші-қонның Қазақстандағы академиялық және институционалдық ортадағы құрылымдық мәселелермен байланысты екенін көрсетті.

Олардың қатарына меритократия қағидаттарының жеткіліксіздігі, қаржыландырудың тұрақсыздығы, бюрократиялық шектеулер және академиялық сараптамаға сұраныстың төмендігі жатады. Ал қабылдаушы елдер, керісінше, академиялық еркіндік, дамыған зерттеу инфрақұрылымы, кәсіби интеграция мүмкіндіктері және өмір сапасының жоғары деңгейі сияқты артықшылықтарды ұсынады.

Зерттеу нәтижелері итеруші және тартушы факторлар теориясы мен көші-қонның кеңірек теориялық тұжырымдамалары аясында қарастырылады. Авторлар зияткерлік көші-қонды ұлттық академиялық жүйелер мен жаһандық білім экономикасының талаптары арасындағы жүйелік сәйкессіздіктің көрінісі ретінде сипаттайды. Нәтижелер Қазақстаннан орын алатын зияткерлік көші-қонның тек экономикалық себептермен ғана емес, сонымен қатар институционалдық сапа, академиялық еркіндік және кәсіби мүмкіндіктер сияқты факторлармен де айқындалатынын көрсетеді. Осыған байланысты зерттеу білікті мамандардың эмиграциясын азайтуға бағытталған саясаттар меритократиялық академиялық жүйелерді нығайтуға, зерттеу инфрақұрылымын дамытуға, институционалдық ашықтықты қамтамасыз етуге және халықаралық академиялық ынтымақтастық мүмкіндіктерін кеңейтуге басымдық беруі қажет деген қорытынды жасайды. Ғалымдардың өмірлік тәжірибелерін талдау арқылы бұл зерттеу посткеңестік кеңістіктегі зияткерлік көші-қонды тереңірек түсінуге үлес қосады және Қазақстанның академиялық экожүйесін нығайтуға арналған ұсыныстар ұсынады.

Түйін сөздер: зияткерлік көші-қон, ми ағымы (brain drain), Қазақстан, итеруші және тартушы факторлар.

Introduction

After the collapse of the Soviet Empire, fifteen countries began their independent development trajectories, and Kazakhstan, with the ninth largest territory in the world and a relatively low population density, faced significant challenges in establishing its position within the global economy (Tazhibayeva, 2017). During the 1990s, many prominent Kazakhstani scientists left the country. As noted by the Minister of Science and Higher Education, while Kazakhstan had approximately 52,000 scientific workers in the early 1990s, by 2000 only around 12,000 remained, resulting in the loss of nearly 35,000 scientists representing the third generation of Soviet-trained researchers (Bakhyt, 2024). Although the large-scale emigration of intellectuals during the early years of independence can be explained by economic hardship, political instability, and uncertainty, the reasons behind the continued outmigration of scholars during periods of relative economic and political stabilization remain insufficiently explored. While several local scholars such as Bokayev and Kaimoldiyev have examined the broader issue of brain drain in Kazakhstan (Bokayev et al., 2020; Bokayev, 2023; Kaimoldiyev, 2021), limited attention has been given specifically to intellectual migration. Overall, there remains a lack of comprehensive data and research on the emigration of Kazakhstani scholars.

Thus, the 100KZGALYM project (translated as “100 Kazakh Scientists”), a public platform, was launched by Dr. Kuanysh Yergaliyev, MD, MPH, DrPH, Assistant Professor at Nazarbayev University School of Medicine. Initiated during his tenure as Vice Minister of Science and Higher Education of the Republic of Kazakhstan, the project aims to document and share the experiences

of Kazakhstani scholars based in academic institutions around the world. The goals of the project are threefold: a. to highlight the contributions of Kazakhstani academics and researchers abroad; b. to encourage collaboration and knowledge exchange between international and domestic scholars; c. to inspire Kazakhstani youth through stories of successful scientific careers.

This paper aims to fill-in the gap of knowledge in the academic and policy literature about reasons and motivations of Kazakhstani scholars to leave abroad and inform the policy makers about the motivations of Kazakhstani scholars working abroad to leave the country through the data obtained within the 100KZGALYM project. Therefore, the main research question of the study is: What are the motivations of Kazakhstani scholars to move abroad?

Migration and Intellectual Mobility in Kazakhstan

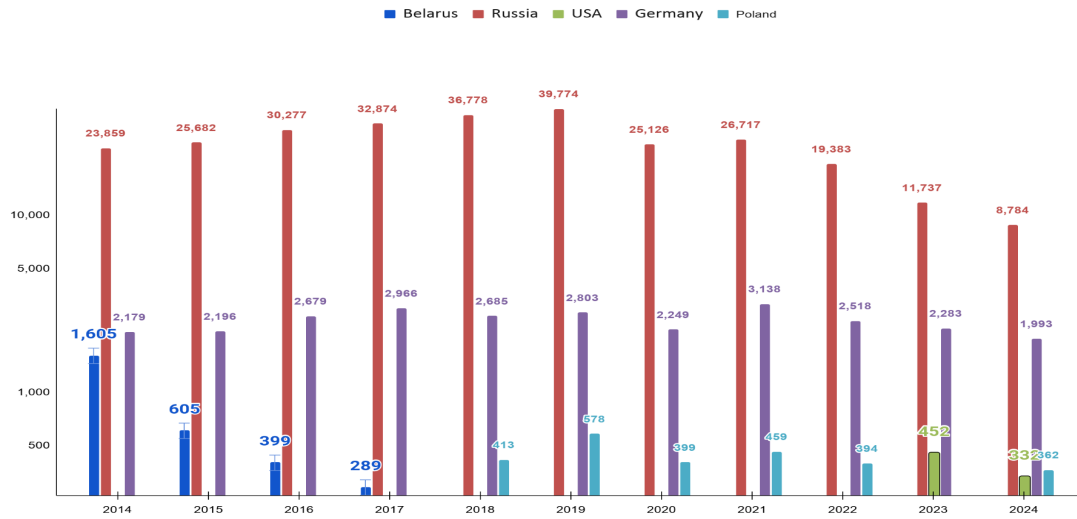
Migration Trends in Kazakhstan

The migration process in Kazakhstan, according to the Migration Profile 2014-2019, can be described across four migration periods (Chernykh & Burnashev, 2020). The period starts from the 1990s, after the country's independence and open borders, that experienced a significant emigration, especially of the Russian speaking population. The second period starts with the 2000s that were associated with the socio-economic stabilization of the country. During this phase National migration policies such as the Migration Policy Program of the Republic of Kazakhstan for 2001–2010 and the Concepts of Migration Policy of the Republic of Kazakhstan (Concept in 2000 and Concept for 2007-2015 in 2007) were developed. From the late 2000s to the mid 2010s, that was the third migration period, global trends and the financial crisis influenced migration dynamics in Kazakhstan, resulting in the lowest migration balance in 2008 and continued support for ethnic immigration until 2012. Since the mid 2010s - the fourth period - the focus of the national migration policy has shifted toward social and economic quality, with an emphasis on human capital development. Analysing the migration flows, the government started to pay attention not only to the quantitative indicators, but also to qualitative characteristics of the migration process. The Concepts of Migration Policy of the Republic of Kazakhstan for 2017–2021 and 2023-2027 were developed.

According to the Figure 1 demonstrated below, Russia consistently remained the top destination for emigrants from Kazakhstan throughout 2014 - 2024, although the numbers have declined significantly since their peak in 2019 (Bureau of National Statistics, 2024). Emigration to Germany also remained relatively stable, with a slight decline in recent years. There are several reasons for the migration of Kazakhstanis to specifically Russia and Germany such as the presence of migration networks built on familial, friendly, and business ties. In terms of moving to the Western countries, including Germany, Kazakhstani people seek higher standard of living and the formation of diasporic communities by migrants from the former USSR countries, which have established migration networks that ease the integration process. Other countries that have been popular among the Kazakhstani people to move for the last 10 years are Belarus, Poland and the USA. Overall, while Russia continues to dominate as the primary destination, there is a clear downward trend in emigration across all countries by 2024.

Figure 1

Emigration trends from Kazakhstan to the top 5 countries between 2014 and 2024

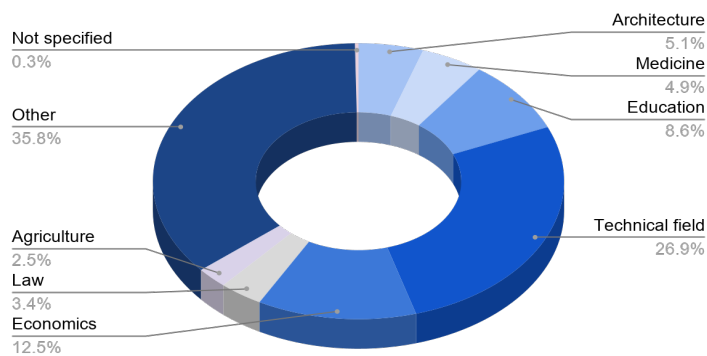


Educational and Occupational Profiles of Emigrants

Overall, for the last 10 years, between 2011-2022, among those who moved abroad, 38% of people had a higher education degree and 34% had technical and professional qualifications (Government of the Republic of Kazakhstan, 2022). According to the statistics provided at Taldau Analytical center (n.d.), the number of people with higher education degrees who left the country in 2024 has constituted 2962 (Taldau, n.d.). In terms of their specialization areas as illustrated in the Figure 2 below, the majority of Kazakhstani emigrants come from technical fields and economic specialties, indicating a significant outflow of professionally skilled individuals. Education and medicine also represent notable sectors, reflecting the emigration of qualified personnel in public service areas. Meanwhile, fields like law, architecture, and agriculture show lower but still relevant levels of emigration.

Figure 2

Occupational profiles of emigrants from KZ



State Policies and Return Initiatives

Kazakhstan has begun to place significant emphasis on the development of science and return of the Kazakhstani scholars to the country in recent years. One of the major steps in this direction was the establishment of a separate Ministry of Science and Higher Education (hereinafter – the Ministry) in 2022. Previously, a single Ministry of Education oversaw all levels of education. The Ministry has developed the Concept for the Development of Higher Education and Science in the Republic of Kazakhstan for 2023–2029, which outlines 13 strategic directions, five of which are dedicated to science (Ministry of Science and Higher Education of the Republic of Kazakhstan, 2023). These directions address various issues related to science, including a new model of science governance, modernization and digitalization of scientific infrastructure, the development of university-based research, and the advancement of applied science and commercialization ecosystems. It is worth highlighting that one of the directions - Direction 10 - is specifically titled Strengthening Intellectual Potential.

Another significant step in advancing science in Kazakhstan was the establishment of the National Council for Science and Technology under the President in 2023 that will collectively define the scientific priorities, evaluate the effectiveness of state policies in science and technology, and address other key issues related to national scientific development. Thus, during the first meeting of the Council in 2024, President of the country - K. K. Tokayev - emphasised the role of science and that during the 1990s about 40 000 scientists left the country (Khabarov, 2024). He also stated that he supports the idea of returning to Kazakhstan the scientists who are successfully working abroad and that a favorable environment is being created for them in the country.

In public speeches, the Minister of Science and Higher Education, Sayasat Nurbek, has also discussed ongoing efforts to encourage scholars to return to Kazakhstan. Referring to initiatives developed in collaboration with embassies, he stated: “Together with the embassies, we created a base; we identified 680 young and experienced scientists working in leading scientific institutes and universities. We are now working on their return” (Bakhyt, 2024). The Minister highlighted three ways of attracting the Kazakhstani scholars working abroad to return to the country: first option is the direct return, as in the case of Dos Sarbassov, who is currently working at Nazarbayev University, leading his own laboratory and a member of the National Council; the second way is to send our scholars to abroad to work and have internship there under our experienced scholars; the third way is to create conditions for our scientists abroad to provide lectures for our local scholars and scientists ([Mironova, 2024](#)).

Another big initiative in creating favorable conditions for the scientific community was the modernization of the Science Academy. The Academy has been awarded the status of the highest scientific organization. Also in 2024 a new Law on Science and Technological Policy was launched. The document considers the norms aimed at improving the model of science management and defines measures of social support for the Kazakhstani scientists. Starting from 2024, in order to enhance the research capability of universities and strengthen their collaboration with industries, the Ministry is actively working on establishing the Scientific and Academic Excellence Centers within 15 regional and 5 pedagogical universities (Higher Education Development National Center, n.d.). These universities receive substantial funding from the Kazakhstani government in order to establish research centers, launch scientific laboratories, train

future scientists from among their students, and collaborate with industries to address regional environmental challenges.

Literature Review and Conceptual Framework

Conceptualizing Intellectual Migration

Within the international community, the intellectual migration theme has been conducted since the mid-20th century, focusing on the movement of scholars and intellectuals, particularly from Europe to the United States during the 1930s and 1940s (Li et al., 2015). This wave included numerous scientists and professionals whose contributions significantly advanced science and technology in the US, establishing it as a leading destination and major beneficiary of global brain drain. Originally, the term emphasized the involuntary nature of this migration, often involving highly accomplished individuals referred to as "refugee intellectuals".

There are a variety of theoretical approaches and models of examining the topic of migration which were developed in isolation from each other, therefore, making it difficult to formulate one holistic theory of migration. This paper uses the Push and Pull Theory in order to conceptualize factors that stimulate intellectual migration. Push and pull factors were firstly introduced by Lee in 1966 as a Theory of Migration (Lee, 1966). The given theory has already been used by other scholars that studied the topic of brain drain (Mahroum, 2000; Kline, 2003; Parkins, 2010; Leitão et al., 2024). By the types of factors considered in the existing literature the following pushing and pulling factors have been outlined.

Push Factors in Intellectual Migration

Pushing factors refer to the conditions in an individual's home country that compel them to leave. One of the primary drivers of brain drain is political instability, manifesting through corruption, weak institutions, and widespread distrust in governance (Levitin, 1997; Fetzer & Millan, 2015; Malokani et al., 2022; Li et al., 2023; Vega-Muñoz et al., 2025). A vivid contemporary example is the Russian invasion of Ukraine, which triggered a mass exodus of skilled professionals. Within the first two months of the conflict, approximately 10% of Ukraine's IT workforce - around 70,000 specialists - left the country (Azimzada, 2024).

Corruption, as a political push factor, also exerts a significant influence. According to Li et al. (2023), corruption directly shapes individuals' preferences for destinations offering more favorable public service delivery and fairer taxation. Indirectly, it undermines essential aspects of development such as economic growth, employment prospects, and financial systems, all of which contribute to the decision to emigrate.

Economic instability is another major factor influencing migration, particularly among professionals (Vega-Muñoz, 2024; Malokani et al., 2022). Several studies argue that both political and economic contexts in one's home country determine the availability and quality of work, thus influencing migration decisions (Ha et al., 2016; Malokani et al., 2022). For instance, ongoing student emigration from Albania and Romania, driven by adverse economic and socio-political conditions, reflects a form of brain drain that hampers national development (Vega-Muñoz, 2025).

Moreover, economic hardship contributes to psychological distress. Financial difficulties can lead to restlessness, interpersonal conflicts, and other stress-related conditions such as difficulties with regular payments and physical exhaustion (Asakura & Murata, 2006; Duszczek, 2019).

Social factors such as poor quality of life, inadequate living conditions, family-related challenges, and general uncertainty are also widely acknowledged push factors (Parkins, 2010; de Haas, 2011). These conditions often create an environment in which individuals- particularly those with specialized skills- feel compelled to seek better opportunities abroad.

Another critical element is the mismatch between a person's qualifications and the availability of suitable employment. Quinn and Rubb (2005) emphasize that migration often occurs when individuals cannot find jobs that match their skills and training. They highlight the importance of an “education-occupation” match, arguing that when highly educated individuals are underemployed or working in unrelated fields, the likelihood of emigration increases significantly.

Pull Factors in Intellectual Migration

Pull factors refer to the conditions in destination countries that make migration appealing. While individual preferences vary, the most commonly cited attractions include improved economic opportunities, political freedom, institutional competitiveness, broader employment prospects, and higher quality of life (Meo et al. 2024; Docquier et al., 2007).

Economic advantages remain the dominant pull factor, especially for skilled migrants from countries experiencing downturns or uneven development (Hoti, 2009; Aytac & Aydın, 2019; Kazlauskienė & Rinkevičius, 2006; Ngoma & Ismail, 2013). In addition to economic drivers, political institutions are increasingly recognized as significant pull factors. According to Arif (2022), educated migrants are more responsive to institutional conditions- including economic, political, and social dimensions- than their less-educated counterparts. Valei and Mamman (2022) similarly identify political stability, democratic governance, and low levels of corruption as key institutional pull factors for migrants.

In the context of academic migration, Khan (2021) identifies five major drivers of brain drain from Europe between 2000 and 2020: (1) more competitive salaries abroad, (2) the dominance of short-term contracts for early-career researchers, (3) non-transparent or biased recruitment processes, (4) favorable immigration policies in host countries, and (5) unintended consequences of internationalization strategies that incentivize long-term mobility.

Access to advanced research infrastructure and technological resources is another powerful motivator for migration among highly skilled professionals (Michaelis, 1990; Vizi, 1993; Latova & Savinkov, 2012; Ganguli, 2015). These structural advantages are further complemented by personal considerations such as family well-being, access to healthcare and education, social equity, and the broader quality of life (Bokayev et al., 2020; Ciorbagiu et al., 2020; Helliwell et al., 2018). As a result, migration decisions often represent not only professional strategies but also long-term lifestyle choices shaped by the intersection of personal goals and systemic conditions.

The Main Causes of Brain Drain

One of the significant causes that brain drain leads to is the economic issues of those countries that lose their qualified people ((Dodani & LaPorte, 2005; Sen, 1973; Tessema, 2010). The effects of the economic consequences as a result of the intellectual migration are direct and measurable: the human capital level of the issuing country decreases because of the shortage of individuals with professional skills. Human capital refers to investing in individuals to enhance their efficiency, as learning organizations recognize the long-term value and diverse qualities people bring to future outcomes (Pasban and Nojede, 2016). In addition to that the issuing country loses in terms of national economy since the qualified people are those with competitive salaries and who contribute to the income tax. This issue becomes even more significant if the issuing country finances the education of those people who will later emigrate and transfer the investments to another country.

Brain Drain in the Kazakhstani Context

In the context of Kazakhstan, the topic of brain drain has been studied by a number of scholars (Bokayev et al., 2020; Bokayev 2023; Chekebayeva, 2021; Kaimoldiyev, 2021; Kuzhabekova et al., 2018; Narymbayeva et al., 2024). Motivations for migration from the country tend to be almost the same according to the scholars. As per the research conducted by Bokayev (2023), one of the main external or pulling factors for migration of Kazakhstani professionals is the economic one. High salaries, a strong socio-economic environment in the destination country, and career opportunities are the most economically attractive factors that the Kazakhstani youth seek for. Another study by Bokayev et al. (2020) also illustrates the quality of life at the destination country and career opportunities as the important pulling factors among the Bolashak graduates aged 23 to 28 and 29 to 35 respectively.

In contrast to pulling factors, there are pushing factors that serve as a reason for the Kazakhstani professionals' migration. Underestimation of skilled professionals and corruption are considered to be one of main internal motivations of people who desire to leave the country (Kapshev, 2021). Kaimoldiyev (2021) also found out that the absence of relevant work in Kazakhstan and lack of demand in the professionals' skills and knowledge acquired abroad because of poor governmental policies tend to be significant pushing reasons for migration. In addition to that, he states that "not all knowledge, competencies and skills applied in Kazakhstan are effective because of several reasons: bureaucracy, corruption and so on" (Kaimoldiyev, 2021, p. 43). The same conclusion was made by Chekebayeva (2021) who indicated the corruption, bureaucracy and weak public administration system as the main pushing reasons for Kazakhstani migrants. Beyond those, Chekebayeva (2021) highlighted the following internal factors such as "absence of prospects for self-realization and career, low level of country development, uncertain own future and future of the children, no improvement of healthcare and education system, high unemployment rate, low salaries level, lack of social guarantees, and violations of human rights" (p. 27).

Although there are considerable studies that covered the migration condition in the Kazakhstani context, they are not focused particularly on intellectual migration. A study of Lee and Kuzhabekova (2018) considered not the intellectual migration from Kazakhstan, but in a reverse direction, to Kazakhstan. The main internal reasons for relocating to Kazakhstan as a result of interviews with 24 international faculty members was the lack of employment opportunities and unsatisfactory work conditions at the home country. To the pulling factors, the authors related the competitive salary with social packages in the form of accommodation subsidies, education

coverage for children, moving expenses and others. A personal interest of the participants - relocating to the “remote region” - along with the opportunity to build new educational programs and conduct research in the “breeding ground” were other external reasons for migrating to Kazakhstan (Lee and Kuzhabekova, 2018, p. 378).

It is worth highlighting another study of Kuzhabekova et al. (2019) that focused on returning Kazakhstani scholars from study abroad. The authors found out that the returning scholars struggle to access local academic communities because of the barriers for early-career researchers and the dominance of senior academics who control funding distribution and influence administrative and policy decisions through informal networks. In addition to that they cannot interact with external scholars because of the limited funding that challenges participation in conferences.

Methodology

Research Design

This study employs a qualitative research approach, focusing on interviews with Kazakhstani scholars and academic staff who moved abroad for work and subsequently participated in the 100KZGALYM project. A qualitative approach was selected for its strength in capturing rich, contextualized narratives and meanings that cannot be easily quantified (Merriam & Tisdell, 2016). The study is situated within an interpretivist paradigm, which acknowledges the socially constructed nature of reality and the importance of subjective experience.

Rather than conducting new interviews for research purposes, this study is based on secondary analysis of self-generated, publicly available interviews. The interview data used were originally collected and published by the researcher as part of a broader public initiative and are now reanalyzed within a scholarly framework. This approach allows for a reflective investigation into the lived experiences, motivations, and identity construction of early-career Kazakhstani academics who have relocated internationally.

Sampling Strategy and Participant Recruitment

This study employed purposive sampling to select interviews relevant to the research aims - specifically, those involving Kazakhstani scholars currently working abroad in academia or scientific research. The selected interviews had to be: a. conducted and publicly shared through the #100KZGALYM project; b. focused on academic career paths, motivations, and transnational experiences; c. accessible in full-text format for systematic analysis.

Although snowball sampling and desktop research were part of the original 100KZGALYM outreach process, no additional recruitment or interviewing was conducted specifically for this study.

Data Collection

The data for this study originate from the 100KZGALYM project. Since its launch, the project has featured more than 30 interviews, which were personally conducted by Dr. Yergaliyev and publicly disseminated via Facebook and Instagram under the hashtag #100KZGALYM. Each post

typically includes a biographical profile, academic reflections, and participants' messages to future scholars. These interviews serve as the primary dataset for this study.

The original interviews included guiding questions such as: What advice would you give to young scientists in Kazakhstan? What three qualities should one develop to succeed in scientific work? What contribution do you believe you can make to the development of science in Kazakhstan at present? Which scientific trends and innovations from around the world do you think our country should pay attention to? What motivated you to study, work, and pursue research opportunities outside of Kazakhstan? These questions shaped the analytical focus of the present research.

Data Analysis

Data were analyzed using the thematic analysis framework proposed by Braun and Clarke (2006), which involves six systematic steps: Familiarization with the data; Generating initial codes; Searching for themes; Reviewing themes; Defining and naming themes; Writing up the findings. Braun and Clarke's six-phase framework is widely recognized as a foundational approach to thematic analysis and has been extensively applied across various disciplines, including health research, education, and the social sciences (Ahmed et al., 2025). The framework highlights the importance of researcher reflexivity and theoretical transparency in ensuring the rigor and credibility of qualitative research. Each phase systematically contributes to the generation of meaningful insights while enabling the researcher to remain closely engaged with the data throughout the analytical process.

The analysis followed an inductive approach, where themes emerged from the data itself rather than being imposed by predefined categories. All interviews were coded manually using Microsoft Word and Excel. The coding process was iterative, with ongoing refinement of themes and categories as patterns became clearer.

Quotes were extracted from the interviews and linked to emerging codes, which were then grouped into subthemes and overarching themes. The analysis focused on identifying key push factors (conditions in Kazakhstan that motivated emigration) and pull factors (attractions of academic life abroad), as articulated in participants' own words.

Ethical Considerations

While the data were already available in the public domain, the following ethical safeguards were observed: a. only interviews that were voluntarily shared by participants for public dissemination were included; b. no sensitive or identifying information beyond what was already publicly posted was analyzed or quoted without clear participant consent; c. anonymization was applied where participants had requested it or where quotes involved potentially sensitive content.

Given the dual role of the researcher as both interviewer and analyst, reflexivity and transparency were maintained throughout the analytic process. A coding log, analytic memos, and an audit trail were kept to ensure dependability and confirmability. To strengthen the trustworthiness of the study, a comprehensive audit trail was maintained throughout the research process. This included preserving interview materials collected from Facebook and Instagram, documenting participant selection procedures, maintaining coding tables and theme development records, and keeping

analytic memos that captured methodological decisions and emerging interpretations. The audit trail also included reflexive notes on the researcher's assumptions and potential biases, allowing for greater transparency in how the findings were developed and interpreted over the course of the analysis. To support transferability, rich descriptions of participants' academic contexts and experiences are provided in the Findings chapter.

Findings

This chapter presents the main findings derived from a thematic analysis of interviews with Kazakhstani scholars working abroad, originally published through the 100KZGALYM public initiative. The data were analyzed inductively using Braun and Clarke's (2006) six-phase thematic analysis. Codes were generated manually and grouped into themes and subthemes, allowing for an organic emergence of recurring patterns. The analytical focus was shaped around pushing factors (barriers and frustrations within Kazakhstan) and pulling factors (attractive features of academic life abroad), articulated in participants' own words.

Participants are referred to by anonymized identifiers (e.g., Participant 12) to protect their identities while maintaining narrative coherence. As the original compiler of the data, I approached these narratives with interpretive empathy and critical distance, aware of the curated nature of these publicly shared stories.

The following sections present the study's findings, organized into two overarching themes - Pushing Factors and Pulling Factors - each further subdivided into political, economic, social, and professional domains.

Demographic profile of participants

The demographic data collected from public interviews revealed several key trends. As illustrated in Table 1, the sample consisted predominantly of male scholars ($n = 20$), while female participants represented one-third of the sample ($n = 10$). In terms of international experience, half of the participants had lived abroad for 15 years or more, whereas only five participants had spent less than five years outside Kazakhstan.

Table 1

Participants by Gender and Years Abroad

Gender	<5 Years	5–9 Years	10–14 Years	≥15 Years	Total
Female ($n = 10$)	3	2	2	3	10

Male (n = 20)	2	3	3	12	20
Total (N = 30)	5	5	5	15	30

As given in Table 2, most participants resided in Europe (n = 13) and the United States (n = 11), while smaller numbers lived in Asia (n = 4) and Australia (n = 1). Regarding return intentions, only one participant had returned to Kazakhstan and another planned to return, whereas the overwhelming majority (n = 28) remained abroad.

Table 2

Participants by Gender and Region of Residence

Gender	Asia	Europe	United States	Other	Total
Female (n = 10)	0	6	3	1	10
Male (n = 20)	4	7	8	0	19
Total (N = 30)	4	13	11	1	29

The majority of participants reported upward career progression (n = 24), indicating advancement in their professional positions following international mobility. In contrast, two participants experienced horizontal career transitions, and four reported a change in professional direction. Notably, none of the participants described downward career movement (Table 3).

Table 3

Participants by Gender and Career Trajectory

Gender	Returned to Kazakhstan	Change of Trajectory	Horizontal Mobility	Upward Mobility	Downward Mobility
Female (n = 10)	0	2	2	6	0
Male (n = 20)	1	2	0	18	0

Total (N = 30)	1	4	2	24	0
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The findings revealed two overarching themes influencing migration decisions: pushing factors and pulling factors. Pushing factors included political issues such as political instability, non-transparent recruitment, and bureaucracy; economic concerns including financial instability and workforce turnover; social challenges related to an uncertain future and low quality of life; and professional limitations such as lack of demand, limited funding, poor infrastructure, and low scientific development. In contrast, pulling factors reflected favorable conditions abroad, including political freedom and internationalization opportunities, competitive salaries and stable employment, enhanced quality of life and family-building prospects, as well as professional advantages such as access to academic communities, stronger ethical standards, demand for expertise, and better resources and infrastructure. Together, these themes provide a framework for understanding the multidimensional factors shaping participants' migration intentions and experiences.

Pushing Factors

Political Factors. Political factors emerged as an important source of dissatisfaction among participants, particularly in relation to instability, bureaucratic practices, and perceptions of unfair institutional processes. Participants commonly associated these conditions with limited trust in the academic environment and uncertainty regarding professional advancement. Concerns about governance and recruitment practices contributed to feelings of insecurity and reduced confidence in long-term academic prospects within Kazakhstan. One participant emphasized the role of connections in employment opportunities, explaining that “compared to his classmates, he had no connections that could help him secure a good job” (Participant 15, personal communication, translated from Russian).

Economic Factors. Economic concerns were frequently linked to instability and limitations within the academic sector. Participants described uncertainty in employment conditions, uneven access to resources, and insufficient funding as barriers to sustainable academic careers. These challenges often affected both professional planning and broader perceptions of future security.

As one participant explained, “the reason for turnover is not even money or conditions. The key problem in Kazakhstan, at the macro level, is unpredictability” (Participant 26, personal communication, translated from Russian). Another participant highlighted resource limitations, stating that “there were limited resources in Kazakhstan in this field...” (Participant 21, personal communication, translated from Russian).

Social Factors. Social factors reflected participants' concerns about long-term wellbeing and living conditions. Participants frequently referred to uncertainty about the future, environmental concerns, and dissatisfaction with broader social conditions. These experiences contributed to perceptions of instability extending beyond the workplace.

For example, one participant stated that “the main reason he left Almaty was poor ecology, which worsens every year” (Participant 26, personal communication, translated from Russian).

Professional Factors. Professional factors were among the most frequently discussed motivations for migration. Participants described limited opportunities for career development, insufficient

demand for expertise, and restricted access to academic networks and research infrastructure. These conditions often created perceptions of professional stagnation and constrained advancement.

One participant explained that “many scholars leave because there is no demand and no conditions to develop as a scientist in Kazakhstan” (Participant 20, personal communication, translated from Russian). Another participant emphasized barriers to academic progression, noting that “there were very limited opportunities to enter doctoral studies” (Participant 29, personal communication, translated from Russian).

Pulling Factors

Political Factors. Political conditions abroad were viewed positively by participants,

particularly in relation to academic freedom and supportive institutional environments. Participants described greater autonomy and openness within international academic systems, which contributed to increased professional satisfaction.

One participant shared that “in the field of pure mathematics, he did not need to express political views, which made him more satisfied as a scholar” (Participant 15, personal communication, translated from Kazakh).

Economic Factors. Economic opportunities abroad were commonly associated with stability and improved working conditions. Participants emphasized the importance of reliable employment, competitive salaries, and financial security in supporting academic productivity and long-term career planning.

As one participant stated, “of course, the demand for scholars there is higher—good working conditions and pay” (Participant 21, personal communication, translated from Russian).

Social Factors. Social factors abroad were closely connected to quality of life and personal wellbeing. Participants highlighted access to better living conditions, security, and opportunities for family life as important aspects influencing their decisions to remain abroad.

For instance, one participant explained that “she started a family in America, and her plans began to change” (Participant 29, personal communication, translated from Russian).

Professional Factors. Professional opportunities abroad were frequently described in terms of stronger academic communities, access to resources, and supportive research environments. Participants valued opportunities for collaboration, mentorship, and participation in international scholarly networks.

One participant noted that “research opportunities abroad allowed the researcher to reconnect with the international scientific community” (Participant 2, personal communication, translated from Kazakh). Another participant emphasized the availability of resources, stating that “abroad these resources are still provided directly” (Participant 21, personal communication, translated from Russian).

Discussion and Conclusion

This study explored the push and pull factors contributing to academic migration from Kazakhstan, situating participants' experiences within broader theoretical frameworks of migration. The findings reaffirm and extend both classical and contemporary migration theories, particularly push-pull theory (Lee, 1966), human capital theory (Beine et al., 2001), and political economy approaches to migration (Castles, 2004). While traditional migration models often emphasize economic motivations, the findings of this study demonstrate that academic migration among Kazakhstani scholars is shaped by a broader interaction of institutional, political, professional, and personal factors. Consistent with contemporary migration scholarship emphasizing institutional quality and governance conditions (de Haas, 2011; Czaika & de Haas, 2014), the study suggests that migration decisions among highly skilled individuals are embedded within wider structural and institutional contexts rather than solely individual economic calculations.

Consistent with previous research on migration from former Soviet countries and institutional quality (Chen et al., 2023; Korobkov & Zaionchkovskaia, 2004; Naumova, 2014; Czaika & de Haas, 2014), political instability and institutional uncertainty emerged as major drivers of academic outmigration. Participants frequently described distrust toward public institutions, dissatisfaction with governance structures, and frustration with bureaucratic rigidity. These experiences echo with other scholars' argument that political fragmentation and institutional instability undermine social trust and institutional legitimacy during periods of transition (Malokani et al., 2022; Ndombi Avouba et al., 2025; Adam & Rena, 2024). In addition, the persistence of nepotism and informal professional practices reflects patterns identified in broader post-communist contexts, where governance challenges and weak meritocratic systems contribute to outward migration among highly skilled professionals. The findings contribute to existing migration literature by illustrating how informal institutional practices, including favoritism and bureaucratic inertia, are experienced not merely as administrative barriers but as factors undermining long-term professional trust, academic belonging, and perceptions of future stability.

Economic push factors were also significant, although participants framed them in more complex ways than simple wage dissatisfaction. Rather than focusing exclusively on income differences, participants emphasized macroeconomic uncertainty, inconsistent research financing, and limited opportunities for academic and professional advancement. These findings align with studies by Meo et al. (2024), Panagiotakopoulos (2020) and Malokani et al. (2022), which demonstrate that economic insecurity and unstable professional environments often intensify migration intentions among highly skilled workers. Importantly, professional grievances, particularly the lack of institutional support for research careers, limited demand for academic expertise, and barriers faced by early-career scholars, interacted closely with broader political and economic conditions (Latova & Savinkov, 2012; Ganguli, 2015). This interconnectedness supports multidimensional migration frameworks proposed by de Haas (2010), in which economic motivations are inseparable from institutional and governance structures.

The findings further suggest important policy implications regarding the relationship between higher education systems and labor market opportunities. Consistent with OECD (2019) and Quinn and Rubb (2005), insufficient alignment between academic qualifications and domestic labor market opportunities may intensify skilled emigration. Participants' concerns regarding limited

professional opportunities and weak research ecosystems indicate that policies aimed solely at increasing salaries may be insufficient for retaining highly skilled scholars. Instead, the literature suggests that long-term investment in research infrastructure, expansion of knowledge-based employment sectors, and the development of transparent and merit-based career pathways may contribute more effectively to reducing intellectual outmigration (Latova & Savinkov, 2012; Ganguli, 2015).

On the pull side, the strongest motivating factors included political freedom, academic autonomy, professional integration, and access to stable institutional environments abroad. These findings support previous research emphasizing the role of civil liberties, institutional quality, and professional opportunities in attracting highly skilled migrants (Parkins, 2010; Khalid & Urbański, 2021). Importantly, participants described these conditions not only in ideological terms but also as practical factors enabling productivity, creativity, and long-term career development. The attraction of internationalized academic systems, access to research resources, and professional recognition abroad also aligns with Beine et al.'s (2001) observation that destination countries attract skilled migrants by providing environments conducive to professional actualization and career fulfillment.

The findings additionally reinforce broader migration scholarship suggesting that institutional quality significantly shapes migration decisions among highly skilled individuals (Akça & Çelik, 2024; OECD, 2019). Participants consistently associated migration destinations with predictability, fairness, academic freedom, and professional recognition. This suggests that policies designed to address intellectual migration should extend beyond financial retention strategies and include broader reforms aimed at improving institutional trust, transparency, research autonomy, and governance quality within higher education and research sectors.

Another important finding was that several participants framed migration not simply as professional relocation, but as a broader transformation of life circumstances. Participants frequently connected migration decisions to family well-being, social stability, personal autonomy, and quality of life. This aligns with contemporary migration scholarship that critiques economically reductionist interpretations of migration behavior (Hsieh & Liu, 1983; Ibrahim et al., 2019). Rather than viewing migration solely through the lens of labor mobility, these perspectives emphasize the importance of social embeddedness, identity, and long-term life planning. The present study extends this literature within the context of post-Soviet academic migration by demonstrating how personal well-being, perceptions of societal predictability, and professional aspirations interact in shaping migration decisions among Kazakhstani scholars.

The findings also have broader implications for understanding intellectual migration within global knowledge economies. Existing literature on highly skilled migration suggests that globalization has increased competition for academic talent, particularly among countries capable of offering stronger institutional environments, research capacity, and professional mobility (Czaika & de Haas, 2014; OECD, 2019; Freeman, 2010). In this context, the migration of Kazakhstani scholars reflects not only individual career aspirations but also structural tensions between national academic systems and global academic labor markets. The findings therefore support arguments that intellectual migration should be understood as both a national development issue and a transnational phenomenon shaped by unequal institutional opportunities across countries.

These findings also indicate the potential importance of transnational academic engagement and diaspora-oriented approaches. Migration literature increasingly suggests that highly skilled migration should not be viewed exclusively as a permanent loss of national human capital, but also as a potential source of transnational collaboration, knowledge exchange, and scientific networking (Latova & Savinkov, 2012; Ganguli, 2015; Castles et al., 2020). In this regard, policies encouraging diaspora engagement, international research collaboration, visiting scholar initiatives, and return migration opportunities may provide more sustainable responses to intellectual migration than restrictive migration approaches. Such strategies may allow scholars abroad to contribute to domestic academic and scientific development while maintaining participation in global research networks.

In conclusion, intellectual migration from Kazakhstan reflects broader structural tensions between domestic academic systems and the evolving global knowledge economy. Political uncertainty, institutional distrust, limited meritocratic opportunities, and structural economic challenges emerged as important push factors shaping participants' migration decisions. At the same time, pull factors such as academic freedom, institutional stability, professional integration, and opportunities for personal and professional development abroad played a central role in attracting scholars to destination countries.

Consistent with broader migration scholarship emphasizing the multidimensional nature of highly skilled migration (de Haas, 2011; Castles et al., 2020), the findings indicate that academic migration from Kazakhstan cannot be understood solely through economic explanations. Rather, migration decisions among scholars are shaped by the interaction of institutional quality, governance conditions, professional recognition, career opportunities, and quality-of-life considerations. Consequently, policies addressing intellectual migration may be more effective when focused not only on financial incentives, but also on strengthening institutional transparency, merit-based academic systems, research infrastructure, international academic engagement, and trust in public and academic institutions. Ultimately, the migration of Kazakhstani scholars reflects not merely individual ambition, but broader structural dynamics associated with participation in an increasingly globalized and competitive knowledge economy.

Limitations and Future Recommendations

This study has several limitations that should be acknowledged. First, its qualitative nature and limited sample size constrain the generalizability of the findings, as the experiences of a select group of already-migrated academics may not represent the broader academic community in Kazakhstan, including those who chose to stay. Additionally, participants' accounts may be influenced by retrospective bias, as they reflect on their decisions after the fact. The findings also reflect a specific political and economic period, which may shift over time, affecting the relevance of conclusions in future contexts. Future research should consider comparative studies across different post-Soviet or Global South countries to identify common patterns or divergences in academic migration. Longitudinal studies could offer insight into the evolving motivations and impacts of migration over time, while policy-focused evaluations could assess the effectiveness of Kazakhstan's strategies to retain or reintegrate academic talent. Finally, further institutional-level

research could explore how specific governance practices or working conditions contribute to migration decisions.

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RESEARCH ARTICLE

The State Language in Kazakhstan's Higher Education: Admission Policy and Artificial Intelligence in Language Education

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Abstract. This article discusses the role of the Kazakh language in Kazakhstan's higher education system amid institutional reforms, including changes in university admissions, unified national testing (UNT), internationalization, and the integration of artificial intelligence (AI). Despite its constitutional status, the Kazakh language's functional role in academic communication remains uneven. The study uses a policy-oriented approach, relying on legislative documents, national statistics, sociological research, and international research on higher education reform and AI in education. It pays particular attention to the interaction between perception mechanisms, language selection in standardized testing, and Kazakhstan's multilingual context. The analysis shows that admission and assessment reforms can change language incentives. Internationalization and English- and Russian-language programs create contradictions between global competitiveness and national language policy. The article examines AI as both a threat and an opportunity. AI can support academic writing and inclusive language teaching in Kazakh, but reliance on English-oriented AI models and limited Kazakh datasets can strengthen the existing language hierarchy. The article concludes that the future role of the Kazakh language depends on language policy, perception reform, and digital transformation strategies. Strategic integration of AI tools and academic language development can strengthen the Kazakh language in higher education and research.

Keywords: Kazakh language policy; higher education in Kazakhstan; university admission reform; Unified National Testing (UNT); artificial intelligence in language education; multilingual education; academic Kazakh.

Аңдатпа. Бұл мақалада Қазақстанның жоғары білім беру жүйесіндегі қазақ тілінің рөлі институционалдық реформалар контекстінде қарастырылады. Университетке қабылдау жүйесіндегі өзгерістер, Ұлттық бірыңғай тестілеудің (ҰБТ) трансформациясы, білім беруді интернационалдандыру үдерістері және жасанды интеллектіні (ЖИ) тілдік білім беруге интеграциялау мәселелері талданады. Қазақ тілі Конституция бойынша мемлекеттік тіл мәртебесіне ие болғанымен, оның академиялық коммуникациядағы және ғылыми білім өндірудегі функционалдық рөлі жоғары оқу орындарында әркелкі болып қалыптасқан. Зерттеу саясатқа бағдарланған аналитикалық тәсілге негізделген және заңнамалық актілерге, ұлттық статистикалық деректерге, тіл саясатына қатысты социологиялық зерттеулерге, сондай-ақ жоғары білім реформалары мен білім берудегі жасанды интеллект

туралы халықаралық зерттеулерге сүйенеді. Мақалада университетке қабылдау тетіктері, стандартталған тестілеуде тіл таңдау мәселесі және Қазақстандағы көптілді білім беру кеңістігінің өзара байланысы сынды аспектілерге ерекше назар аударылады. Талдау нәтижелері қабылдау және бағалау жүйесіндегі реформалардың тілдік мотивацияларға әсер ететінін көрсетеді. Сонымен қатар, интернационалдандыру саясаты мен ағылшын және орыс тілдеріндегі білім беру бағдарламалары жаһандық бәсекеге қабілеттілік пен ұлттық тіл саясаты арасындағы ықтимал дилеммаларды тудырады. Мақалада жасанды интеллект қос қырлы құбылыс ретінде қарастырылады: бір жағынан, ол қазақ тіліндегі академиялық жазылымды дамытуға және инклюзивті тілдік оқытуды қамтамасыз етуге мүмкіндік береді; екінші жағынан, ағылшын тіліне бағдарланған ЖИ модельдеріне тәуелділік және қазақ тіліндегі деректердің шектеулігі қалыптасқан тілдік иерархияны нығайтуы мүмкін.

Қорытындылай келе, қазақ тілінің жоғары білім мен ғылыми зерттеулердегі перспективалық рөлі тіл саясатының, қабылдау жүйесін реформалаудың және цифрлық трансформация стратегияларының синергиясына тікелей байланысты екендігі айқындалады. Жасанды интеллект құралдарын стратегиялық тұрғыда қолдану және академиялық тілдік құзыреттілікті дамыту қазақ тілінің жоғары білім беру мен ғылым саласындағы функционалдық рөлін арттыруға ықпал етеді.

Түйін сөздер: қазақ тіл саясаты; Қазақстандағы жоғары білім; университетке қабылдау реформасы; Бірыңғай ұлттық тестілеу (ҰБТ); тілдік білім берудегі жасанды интеллект; көптілді білім беру; академиялық қазақ тілі.

Introduction

Higher education (HE) represents a critical transitional space bridging secondary education, state policy, and the labor market. Within this ecosystem, language choices carry profound pragmatic, economic, and institutional value (Amirbekova et al., 2025). In Kazakhstan, contemporary macro-level reforms in university admission, standardized assessment systems, internationalization, and rapid digital transformation are actively reshaping linguistic incentives and academic practices. Although Kazakh holds constitutional status as the state language, its practical application in advanced academic communication, scientific research, and knowledge production remains unevenly distributed across institutional types and disciplines (Italmassova et al., 2022; Kucherbayeva & Smagulova, 2023). Understanding how evolving state reforms influence the functional status of Kazakh is therefore essential for evaluating the systemic coherence and long-term viability of national language planning (Didarbekova et al., 2025; Mingisheva, 2023).

Kazakhstan's HE operates within a complex multilingual environment characterized by functional differentiation among Kazakh, Russian, and English. While Kazakh serves as the state language, Russian continues to play a strong role as a vehicle for interethnic communication and legacy academic interaction. Concurrently, English is heavily emphasized as the language of internationalization, global scientific visibility, and economic competitiveness (Tlepbergen et al., 2025). This asymmetrical distribution of linguistic capital directly impacts university admission protocols, mediums of instruction, academic mobility, and graduate professional trajectories. Consequently, universities serve as primary sites of operation where state language policy is negotiated, resisted, and enacted in daily practice (Yessenbekova, 2021; Kucherbayeva & Smagulova, 2023; Goodman et al., 2025; Hajar, 2026).

Recent systemic reforms have intensified these linguistic tensions. Planned structural modifications to the Unified National Testing (UNT)—specifically a shift toward literacy and competency-oriented assessment models designed to mirror international benchmarks like the Scholastic Assessment Test (SAT)—are fundamentally reshaping the linguistic competencies demanded of university applicants. Simultaneously, state-driven internationalization policies and international student recruitment strategies prioritize English and Russian-medium instruction to attract external revenue. Parallel to these institutional changes, the acceleration of digital transformation and the integration of artificial intelligence (AI) tools cannot be viewed as isolated technological developments. Instead, AI serves as an emergent infrastructure that impacts academic communication, controls access to knowledge, and alters language hierarchies within HE ecosystems (Akavova et al., 2023; OECD, 2023; UNESCO, 2025). AI technologies hold the potential to either strengthen the functional role of regional languages through localized digital tools or exacerbate existing inequalities by favoring globally dominant, high-resource vehicular languages.

Research Gap: Isolating Converging Reforms

A rich body of scholarship has examined language policy in Kazakhstan, with foundational literature historically focused on sociolinguistic identity formation and bilingual or multilingual instruction within primary and secondary schooling ecosystems. More recently, attention has turned toward HE language policy, critically exploring the challenges of English-medium instruction (EMI), faculty readiness, and institutional implementation (Goodman et al., 2025; Hajar, 2026). However, existing HE research remains highly segmented. Studies generally analyze university management modernization, internationalization strategies, standardized testing, or educational digitalization as isolated administrative trends (Yessenbekova, 2021; Kucherbayeva & Smagulova, 2023; OECD, 2025). There is a notable lack of comprehensive scholarship investigating how admission reforms, competency-based assessment models, internationalization pressures, and emerging AI-driven technologies collectively and intersectionally reshape the functional capabilities of the state language (Baizhanov et al., 2025). The specific research gap is the lack of a unified framework to evaluate how these distinct, often competing, institutional forces alter language incentives for students and institutions alike.

Research Objective and Questions

The primary objective of this study is to examine how contemporary structural reforms—specifically in high-stakes admission testing, international student recruitment, and digital integration—collectively influence the functional status and institutional positioning of the Kazakh language within HE institutions.

To achieve this objective, the study addresses the following three research questions:

- 1) How is the state language positioned within the evolving architecture of university admission and standardized assessment systems in Kazakhstan?
- 2) How do internationalization strategies and multilingual educational practices influence or constrain the practical, functional status of Kazakh in university-level academic programs?

- 3) How do digital transformation processes and AI-supported educational tools alter the linguistic landscape, and how might they affect the future development of the state language in academic communication?

By synthesizing language policy analysis with perspectives from HE reform and digital transformation, this article makes a distinct theoretical and empirical contribution to the field of language policy and planning (LPP).

Literature Review

Within the field of LPP, a critical distinction exists between top-down legislative declarations and bottom-up linguistic realities. From an LPP perspective, the functional status of a language is determined not merely by its formal legal or constitutional recognition, but by the structural depth to which it is actively deployed across core societal domains: education, standardized assessment, scientific research, public administration, and professional communication (Goundar, 2026; Pantaleon, 2026). Complementing this status is the concept of language incentives, defined as the matrix of institutional, academic, and socio-economic rewards or penalties that systematically shape individual and collective language choices within educational and professional ecosystems (Gonzales, 2025; Turba, 2026).

In multilingual HE systems, university admission policies and high-stakes assessment mechanisms do not operate as neutral administrative procedures; rather, they function as primary instruments of language governance (Miranda et al., 2024; Almashour, 2026). By assigning institutional value to specific languages, these gateways dictate linguistic hierarchies, control academic mobility, and calibrate the socio-economic return on a speaker's linguistic capital. Consequently, analyzing a state language requires evaluating how assessment reforms and institutional frameworks align to create structures for its daily, practical use.

In Kazakhstan, UNT serves as the definitive mechanism for university admission and the competitive allocation of state-funded educational grants (Didarbekova et al., 2025; Abdrasilov, 2026). As a high-stakes assessment, the UNT exerts a powerful washback effect on the entire educational pipeline, shaping pedagogical priorities in secondary education and steering language preferences in HE.

Sociolinguistic research demonstrates that language selection during high-stakes testing is heavily pre-determined by the medium of instruction in secondary schooling and parental expectations of socio-economic return (Kuzhabekova, 2019; Sibanda & Tshehla, 2025). Historically, Kazakhstan's secondary school ecosystem has been bifurcated into Kazakh-medium and Russian-medium institutions. Graduates of Kazakh-medium schools naturally maintain their academic trajectory in the state language to maximize their performance on the UNT and secure state grants (Mirzoyeva et al., 2024; Khamit et al., 2025; Zharkynbekova et al., 2025). Therefore, the upward trajectory of Kazakh language selection at the UNT is fundamentally reflective of structural transformations within the macro school system—specifically, a demographic shift and a rising enrollment trend in Kazakh-medium primary and secondary education—rather than a shift in preference among individual applicants. As admission systems increasingly prioritize analytical reading, logical reasoning, and advanced academic writing, the qualitative development of Kazakh-language

testing materials becomes paramount. However, a critical gap remains in the literature: it remains an open question to what extent the UNT's modernized, Kazakh-language academic content genuinely fosters and measures analytical thinking and subject-specific discourse, or whether it continues to lag established Russian or English academic matrices.

The rapid internationalization of Kazakhstan's HE system further complicates these internal linguistic hierarchies. Data from the Bureau of National Statistics (BNS) (2025) indicates that 33,500 international students were enrolled in domestic universities during the 2025–2026 academic year. This diverse international cohort comprises citizens from different countries, with the largest student populations coming from Turkmenistan, India, and Uzbekistan.

While this influx highlights Kazakhstan's growing competitiveness in the regional education market, it simultaneously intensifies domestic multilingual asymmetries. To attract foreign revenue and elevate global rankings, universities rapidly expand their portfolios of Russian- and English-medium tracks—particularly in highly sought-after domains such as clinical medicine, engineering, and global business management. Consequently, international students are predominantly funneled into non-Kazakh medium tracks, languages associated with global mobility gain heightened institutional prestige and practical utility, while Kazakh is relegated to a symbolic or supplementary integration course (Akkari et al., 2023; Tajik et al., 2023; Yelubayeva et al., 2023). This reveals an unresolved policy paradox: the institutional push for global integration and international student recruitment directly competes with the domestic agenda of expanding the state language's functional capacity in higher-tier academic research.

Nevertheless, HE institutions remain crucial sites for potential linguistic integration. Coordinated language planning—such as credit-bearing academic literacy initiatives and institutional language support systems—could leverage this diverse environment to strengthen intercultural communication and long-term social cohesion. However, if internationalization policies proceed without deliberate structural integration, the state language risks becoming symbolically venerated but functionally marginalized within the nation's elite, internationally oriented academic programs.

The current architecture of generative AI also threatens to worsen digital linguistic inequalities (Assaf, 2026). Because leading AI models are trained predominantly on massive English-language datasets, low-resource and regional languages face systemic marginalization, often exhibiting lower syntactic accuracy and limited discipline-specific nuance. In the context of HE, an over-reliance on English-centric digital ecosystems may subtly discourage students and researchers from producing original scholarship in the state language.

Limited empirical attention has been paid to how standardized assessment shifts, labor-market incentives, international recruitment strategies, and emerging AI technologies collectively influence the functional capability of the state language. This study addresses this theoretical and empirical gap by integrating these disparate threads into a unified analytical framework

Methodology

This study employs a qualitative, policy-oriented analytical review design to examine how HE reform, admissions policy, multilingualism, and digital transformation influence the functional role of the Kazakh language in Kazakhstan's universities. Rather than generating primary empirical data, the study synthesizes policy documents, statistical reports, sociological studies, and scholarly literature in order to identify structural trends, institutional contradictions, and emerging language policy dynamics within HE.

Source Selection and Data Collection

The analysis is based on four categories of sources. First, legal and regulatory documents related to HE, language policy, and educational reform in Kazakhstan were examined. These included constitutional provisions, strategic development concepts, and official policy documents issued by the Ministry of Science and Higher Education of the Republic of Kazakhstan (MSHE). Second, official statistical data were collected from the BNS and national education reports. These materials included data on UNT, language choice in standardized assessment, and international student enrollment in HE institutions. Third, the study analyzed sociological and analytical reports on language policy implementation in Kazakhstan, particularly the report titled *Sociological and Analytical Studies on Language Policy Issues in the Republic of Kazakhstan*. These reports were used to identify patterns of language competence, public attitudes, and expert evaluations concerning multilingualism and the functional role of the state language. Fourth, peer-reviewed international and regional scholarship on language policy, multilingual education, HE reform, and AI in education was reviewed.

Priority was given to studies published between 2008 and 2026 that directly addressed multilingual HE systems, assessment reform, linguistic incentives, and digital transformation in educational contexts. Sources were selected according to three criteria:

1. relevance to HE and language policy in Kazakhstan;
2. direct connection to admission reform, multilingualism, or digitalization;
3. institutional or scholarly reliability.

Analytical Framework

The study is theoretically informed by LLP theory (Spolsky, 2019; Shohamy, 2020), sociolinguistic approaches to multilingualism, and perspectives on HE reform. These frameworks were used not as empirical evidence but as conceptual tools for interpreting how institutional structures shape language use and linguistic incentives within HE.

The concept of *functional status* was used to examine the extent to which Kazakh operates as a practical language of assessment, academic communication, and knowledge production rather than solely as a symbolically recognized state language. The concept of *language incentives* guided the analysis of how admission systems, internationalization, and labor-market expectations influence language choice among students and institutions.

Analytical Procedures

The analysis was conducted using qualitative thematic document analysis. Policy documents, statistical reports, and scholarly studies were systematically reviewed and coded according to four thematic categories:

1. University admission and assessment reform;
2. Multilingual educational practices;
3. Internationalization and international student recruitment;
4. Digital transformation and AI in language education.

Comparative analysis was then used to identify relationships and contradictions between official language policy objectives and actual institutional practices. Statistical indicators were interpreted in relation to broader sociolinguistic and educational trends rather than treated as isolated quantitative findings.

The study also employed interpretive synthesis to integrate findings from policy documents, sociological data, and international literature, developing an understanding of how HE reforms influence the functional role of the state language.

Scope and Limitations

The study focuses specifically on HE policy and institutional dynamics rather than classroom-level pedagogical practices. The analysis emphasizes system-level reforms, admission structures, and language policy implementation. Although the study discusses AI and digital transformation, it does not empirically evaluate specific AI platforms or conduct experimental analysis of educational technologies. Because the study relies primarily on document analysis and secondary data, its conclusions are interpretive rather than predictive. Nevertheless, the combination of policy analysis, sociological evidence, and comparative literature provides a comprehensive framework for examining language policy transformations in Kazakhstan's HE system.

Results

The analytical review identified four major patterns regarding the role of the state language in Kazakhstan's HE system:

- (1) Admission reform increasingly functions as an indirect language policy instrument;
- (2) Multilingual educational practices continue to produce functional asymmetries between Kazakh, Russian, and English;
- (3) Internationalization strengthens global competitiveness while complicating the functional expansion of Kazakh in HE;
- (4) Digital transformation and AI create both opportunities and risks for the development of academic Kazakh.

Admission Reform and Linguistic Incentives

University admission policies serve as a primary regulatory mechanism for operationalizing language policy and governance in Kazakhstan's HE system (Didarbekova et al., 2025). Rather

than simply controlling institutional access, standardized admission procedures, testing languages, and assessment formats establish powerful functional incentives that direct stakeholders' linguistic choices (Hajar & Karakus, 2026).

As a high-stakes national assessment, the UNT remains the sole definitive pathway for university admission and determines eligibility for competitive, state-funded educational grants (Hajar & Karakus, 2023; Abdrasilov, 2025; Serikbayeva et al., 2026). Consequently, the structural configuration and linguistic delivery of the UNT heavily dictate applicants' strategic choices, with recent empirical indicators highlighting a massive quantitative expansion of the state language within this screening mechanism (Didarbekova et al., 2025). According to the MSHE (National Testing Center, 2026), recent national monitoring data show that the UNT has experienced a sharp year-over-year increase to approximately 187,000 registered candidates, up 20,000. The linguistic breakdown of these test-takers reveals a striking numerical concentration (Table 1):

Table 1

Applicants' Linguistic Preferences for UNT

Language of testing	Percentage	Number of applicants (N)
Kazakh	75.2%	140,624
Russian	24.6%	46,002
English	0.2%	189
Total	100%	186,815

Note. Adapted from *On the results of registration and statistical monitoring by the Ministry of Science and Higher Education of the Republic of Kazakhstan* (2026).

These metrics empirically validate the absolute quantitative dominance of the Kazakh language in high-stakes assessments. However, sociolinguistic theory cautions that a high volume of test-takers does not automatically imply equivalent functional status or real-world academic depth (Liddicoat, 2016; Smagulova, 2021). The choice of test language often reflects deeply entrenched prior schooling tracks and secondary educational environments rather than a conscious, proactive adherence to HE language-policy goals.

Multilingual Practices and Persistent Functional Asymmetries

While the Constitution of the Republic of Kazakhstan (1995) designates Kazakh as the state language, a sharp divergence persists between its legal status and its practical use across academic disciplines. Empirical findings from the 2025 national report, which contains extensive data from 6,000 adult respondents across all regions and 700 respondents from the business sector, reveal highly stratified linguistic competence: 48.3% of respondents report full fluency in Kazakh, 20.9% maintain reading comprehension but lack written literacy, 13.2% possess varying combinations of passive listening/speaking skills, and 18% report little to no proficiency (Committee on Language Policy, 2025, p.26). This uneven distribution underlines a critical literacy bottleneck. Because

high-tier academic research and publishing demand advanced formal writing skills, this deficit structurally limits Kazakh's capacity to serve as a seamless interethnic medium in complex institutional spaces (Zharkynbekova et al., 2025).

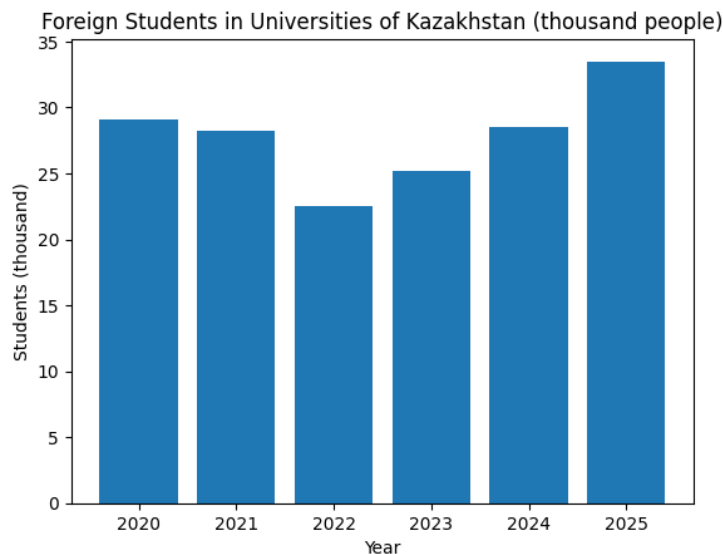
This proficiency gap reinforces rigid functional asymmetries in higher-education tracking. Kazakh dominates public administration, law, and education, but Russian remains entrenched in technical and medical fields, while English dominates globalized academic tracks (Mirzoyeva et al., 2024). This university stratification mirrors the labor market, where 37.1% of business-sector respondents use Russian due to regional economic integration and a perceived lack of commercial utility in Kazakh (Committee on Language Policy, 2025, p. 139). Because students act as rational economic agents, their language selections at university are strategically calibrated against these market realities to balance identity with career mobility (Khamit, 2025).

Furthermore, expert evaluations confirm significant structural barriers to native knowledge production (Committee on Language Policy, 2025, p. 183): 26% cite methodological shortcomings in pedagogy, 24% point to low-quality textbooks and scarce scientific literature, and 12% note limited technical content. Consequently, while 26% view the language as fully developed, 62% of experts maintain that Kazakh requires systematic structural development to effectively sustain higher-tier scientific and academic research registers.

Internationalization vs. Functional Expansion of the State Language

The top-down drive to enhance global competitiveness in Kazakhstan's HE system introduces a distinct policy paradox: internationalization strategies heavily prioritize EMI to elevate global rankings, directly competing with the domestic agenda of expanding the state language's scientific capacity (Akkari et al., 2023). According to the BNS, international student enrollment has shown a resilient upward trajectory over the past several years, following a brief contraction during the COVID-19 pandemic (Figure 1):

Figure 1. Number of international students in Kazakhstan universities (2020–2025)



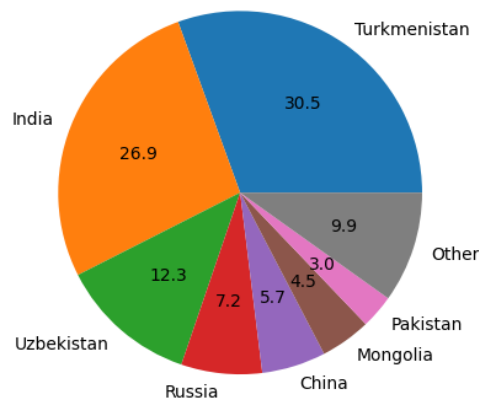
Note. This figure illustrates the dynamics of international student enrollment at Kazakhstani universities from 2020 to 2025. Adapted from the official statistics of the Republic of

Kazakhstan, Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, n.d. (<https://stat.gov.kz/en/>).

The international student enrollment has followed a resilient upward trajectory after a brief pandemic contraction: expanding from 29.1 thousand in 2020, through a low of 22.5 thousand in 2022, rebounding to 28.5 thousand in 2024, and peaking at 33.5 thousand from different countries at the start of the 2025–2026 academic year (Bureau of National Statistics, 2026). This international cohort relies heavily on regional and South Asian partners (Figure 2), primarily originating from Turkmenistan (10,200), India (9,000), Uzbekistan (4,100), Russia (2,400), China (1,900), Mongolia (1,500), and Pakistan (1,000) :

Figure 2: International Students' Distribution by country, 2025-2026.

Foreign Students by Country of Origin (2025/2026)



Note. The data represents the enrollment distribution of international students by their country of origin for the 2025–2026 academic year. Adapted from the official statistics of the Republic of Kazakhstan, Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, n.d. (<https://stat.gov.kz/en/>).

While this growing presence intensifies the multilingual character of universities, it creates an institutional disconnect. Because Kazakh is not a requirement for international admission, international students are overwhelmingly funneled into Russian- or English-language tracks in medicine, engineering, and business, while Kazakh is relegated to a supplementary integration course (Tajik et al., 2023). This structural asymmetry is mirrored in state financing: only 5,800 international students receive state-funded grants, accounting for a minor 2.2% of total allocations compared to 97.8% for Kazakhstani citizens (Bureau of National Statistics, 2026). This financial split underscores that while universities leverage international enrollment for global prestige, they continue to rely on foreign languages, thereby marginalizing the state language in elite, higher-tier academic research and in international student integration corridors. The geographic distribution of this international student population reveals a heavy reliance on regional states and South Asian partners.

Digital Transformation and AI as Catalysts and Risk Factors

The rapid integration of AI and digital tools into Kazakhstan's HE system presents a dual paradigm: it introduces powerful mechanisms to bridge literacy gaps while simultaneously threatening to exacerbate linguistic inequities:

- On the architectural side, digital transformation and Generative AI offer valuable opportunities to bolster academic Kazakh. Writing and Literacy Support Large Language Models (LLMs) provide automated real-time writing assistance, syntax correction, and stylistic editing. The domestic launch of Kaz-LLM, developed through localized partnerships between Beeline Kazakhstan and Qazcode, represents a critical step toward building a native-language infrastructure. Training models on localized datasets helps standardize technical terminology and reduces dependence on English-centric software (Aldash et al., 2025).

- The digital affordances carry severe systemic risks without a coordinated national strategy. Global AI ecosystems remain overwhelmingly dominated by resource-rich languages like English. Because Kazakh has a smaller digital footprint and less annotated training data, global commercial AI models often produce lower-quality outputs in the state language.

If national investments in the digitization and curation of native academic text corpora lag behind, university students may strategically switch back to English or Russian AI platforms to access superior analytical outputs. This shift could create a new layer of digital language stratification, potentially reinforcing the marginalization of Kazakh in advanced research and automated assessments.

Discussion

The empirical findings uncover a fundamental tension at the heart of Kazakhstan's HE ecosystem. While top-down structural mechanisms have successfully anchored the symbolic authority and numerical dominance of the state language, its advanced academic applications remain constrained by market incentives, internationalization pressures, and digital resource constraints.

By analyzing these dynamics through the lens of modern LPP theory (Spolsky, 2019), this section explores how these four patterns interact to shape the real-world trajectory of language governance.

The Admissions Lever: Moving from Numerical Presence to Analytical Literacy

The overwhelming concentration of UNT applicants choosing the Kazakh medium (75.2%) validates the power of centralized testing as an instrument of macro-level language governance (Lauridsen, 2013; Spolsky, 2019). By directly linking university entry and state-funded grants to a single high-stakes examination, the state has created a potent structural incentive that shapes the entire secondary schooling pipeline (Smagulova, 2021). However, as Shohamy (2020) notes, high-stakes assessments are never merely passive evaluation tools; they actively define institutional norms. The current policy push to align the UNT with skills-based international benchmarks, such as the SAT framework (College Board. (n.d.)), shifts the testing paradigm away from rote memorization and toward advanced cognitive competencies, logical reasoning, and evidence-based analytical literacy.

This shift exposes a critical qualitative dependency. If Kazakh-medium testing materials are designed as reactive translations of Russian or English prototypes rather than via autonomous item generation, they risk losing psychometric validity and penalizing native test-takers. To ensure true educational equity, the state must move beyond superficial numerical goals and prioritize developing high-quality, authentic Kazakh academic content that fosters native, subject-specific discourse from the point of entry.

Market Realities and the Limits of De Jure Revitalization

The stratification of language proficiency highlighted in the 2025 national report underscores the persistent gap between *de jure* constitutional status and *de facto* functional implementation (Spolsky, 2019). The finding that 20.9% of respondents can read Kazakh but lack formal written literacy poses a direct challenge to HE. Because advanced academic discourse relies heavily on sophisticated written registers, this widespread literacy bottleneck structurally limits the state language's capacity to serve as an independent engine of scientific inquiry.

This literacy gap reinforces the disciplinary asymmetries observed across university tracks. The Kazakh has successfully normalized its presence within public administration, law, and education—fields closely tied to state institutions and local legal frameworks. Conversely, technical, medical, and globalized business domains remain heavily anchored in Russian or English.

This tracking is a rational response to a labor market where 37.1% of corporate professionals favor Russian due to regional economic integration and a perceived lack of commercial utility for Kazakh (Committee on Language Policy, 2025, p.139). Because students act as rational economic agents, they calibrate their language choices at university against tangible market rewards (Khamit, 2025; Mirzoyeva et al., 2024). Consequently, declarative language status alone cannot compel broader academic adoption if elite professional sectors continue to incentivize the use of external languages (Spolsky, 2019). The structural barriers cited by experts—methodological shortcomings (26%) and poor textbook quality (24%)—demonstrate that Kazakh is limited by material infrastructure rather than any intrinsic academic deficit.

The Internationalization Dilemma: Managing Prestige and Two-Tiered Academics

The steady rise in international enrollment, reaching a peak of 33.5 thousand students in the 2025–2026 academic year, reflects Kazakhstan's growing regional academic competitiveness. Yet, this expansion highlights an unresolved policy paradox: the institutional push for international recruitment directly competes with the domestic mandate to expand the scientific capacity of the state language.

To sustain enrollment volumes from regional and South Asian partners, universities funnel international students into EMI or Russian-medium tracks, particularly in high-demand specializations such as medicine and engineering (Akkari et al., 2023). Within this framework, Kazakh is frequently excluded from the core curriculum and reduced to a symbolic, non-mandatory integration course.

This parallel track creates an institutional hierarchy of prestige (Tajik et al., 2023). By positioning English and Russian as the exclusive media for international research and funding—as evidenced by the fact that foreign recipients account for only 2.2% of state educational grants—the system implicitly codes Kazakh as a localized, non-exportable language. This structural split risks cementing a two-tiered academic hierarchy where local identity languages remain isolated from globalized knowledge corridors.

Digital Transformation: AI as an Equalizer or an Asymmetry Vector

The rapid deployment of digital tools and sovereign projects like Kaz-LLM introduces a powerful, unpredictable variable into language planning (Omarova, 2024). On the one hand, generative AI can serve as a vital equalizer, offering automated editing, syntax correction, and adaptive instructional feedback that directly bridge the written literacy gaps observed among university entrants.

On the other hand, without coordinated state-led investment, this technological turning point could dramatically worsen existing linguistic inequities. LMMs are fundamentally data-dependent architectures that favor resource-rich languages (Bender et al., 2021). Because academic Kazakh has a significantly smaller digital footprint and fewer annotated training datasets, commercial AI tools often produce lower-quality analytical outputs in the state language.

If university students find that Kazakh-medium AI engines cannot match the cognitive depth and terminological precision of English- or Russian-language models, they will strategically migrate back to dominant-language platforms. To prevent a future in which Kazakh is digitally marginalized, language policy must transition from merely using AI tools to aggressively funding the systematic digitization, curation, and standardization of comprehensive native academic text corpora.

To resolve these structural asymmetries, Kazakhstan can draw on successful international models of language normalization, like in other countries:

- Estonia (Keeleklikk): Demonstrates the power of centralized digital architectures to rapidly normalize language acquisition across professional tracks (Pool et al., 2024).
- Israel (Ulpan): Illustrates the efficacy of intensive, workplace-aligned language immersion that links communicative competency directly to career advancement. (Manor & Masry-Herzallah, 2026.)
- Quebec, Canada (Franchising Frameworks): Proves that language revitalization succeeds when structural, institutional incentives make the local language an essential asset for economic and professional mobility (Albouy, 2008).

Importantly, national survey data reveal that only 2% of domestic experts advocate for a restrictive, monolingual educational model, indicating overwhelming public support for a balanced multilingual reality (Committee on Language Policy, 2025, p. 179).

Therefore, university language policy should reject zero-sum replacement strategies and focus entirely on establishing functional parity within a stable trilingual framework. The institutions can actively drive this normalization by implementing three targeted, structural reforms:

- Advanced Writing Support: Establish dedicated writing centers to build formal academic literacy and support peer-reviewed research production in Kazakh.

- Corpus Digitization: Actively fund the compilation and annotation of native scientific text corpora to standardize technical terminology for AI integration.
- Balanced Incentive Structures: Align academic advancement and institutional publishing metrics to reward the generation of high-tier research natively in the state language.

By shifting the policy focus from symbolic validation to building the material and digital infrastructure of knowledge production, Kazakhstan can successfully resolve its HE paradox—transforming the state language into an enduring, independent engine of advanced scientific inquiry and global academic integration.

The findings of this study demonstrate that the role of the state language in Kazakhstan's HE system is increasingly shaped by the interaction of admission reform, multilingual educational practices, internationalization, and digital transformation. Rather than functioning independently, these processes collectively influence linguistic incentives, academic mobility, and the practical value of language choice within universities. The analysis suggests that the future position of Kazakh in HE depends less on formal constitutional recognition alone and more on the extent of its institutional integration into assessment systems, academic communication, and digital infrastructure.

Conclusion

The evolution of language governance in Kazakhstan's HE system highlights the limits of purely quantitative policy metrics. While centralized admissions mechanisms have successfully established the numerical dominance of the state language (75.2% of UNT applicants), a distinct gap persists between this symbolic authority and its advanced functional execution. The university ecosystem remains constrained by a formal written literacy bottleneck among entrants, a labor market that structurally incentivizes legacy languages in technical and commercial domains, and an internationalization strategy that isolates the state language from global cohorts. Furthermore, the transition to digital architectures such as generative AI risks exacerbating these asymmetries if native scientific data infrastructure remains underfunded.

Ethics Statement: Ethical approval was not required for this study as it relies entirely on publicly available, aggregated, and de-identified national statistical data and published institutional policy documents. No human participants were directly recruited, and no private personal data was accessed.

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RESEARCH PAPER

**Who Gets In?
Inequality in Access to Elite Higher Education**

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Abstract This study provides the first national-level quantitative evidence on inequality in access to elite higher education in Kazakhstan. Using administrative data on the universe of secondary school graduates between 2021 and 2023 ($N = 499,150$), we examine how individual- and school-level characteristics shape access to Nazarbayev University (NU), the country’s most selective and well-resourced postsecondary institution. We document a strong concentration of NU enrollment among graduates of selective exam-based public secondary schools. Although these schools educate fewer than 5 percent of students nationwide, they account for more than 80% of NU enrollees. *Ceteris paribus*, graduates of selective secondary schools are 2–4 percentage points more likely to enroll at NU compared to their peers in mainstream schools. Given that just 0.2% of mainstream school graduates enroll at NU, these estimates imply that students from selective schools are approximately 8 to 20 times more likely to gain access to the university. The results suggest that NU’s admissions disproportionately favor students from selective secondary schools and may thereby reinforce cumulative educational advantages and deepen vertical stratification in access to higher education in Kazakhstan. The findings underscore the need for early and targeted policy interventions aimed at reducing preparatory and informational inequalities in access to selective postsecondary institutions.

Keywords: educational inequality; access to postsecondary education; elite higher education; Kazakhstan; Nazarbayev University.

Аңдатпа Бұл зерттеу Қазақстандағы элиталық жоғары білімге қолжетімділіктегі теңсіздікті ұлттық деңгейде сандық тұрғыдан алғаш рет талдайды. Зерттеуде 2021–2023 жылдар аралығындағы жалпы білім беретін мектеп түлектерінің толық әкімшілік деректері ($N = 499\,150$) пайдаланылып, жеке тұлғалық және мектеп деңгейіндегі сипаттамалардың елдегі ең таңдаулы әрі ресурстармен ең жақсы қамтамасыз етілген жоғары оқу орны – Назарбаев Университетіне (NU) түсу ықтималдығына қалай әсер ететіні зерттеледі. Сипаттамалық талдау Назарбаев Университетіне қабылданған

студенттердің басым бөлігі іріктеу емтихандары негізінде қабылдайтын мамандандырылған мемлекеттік мектептердің түлектері екенін көрсетеді. Мұндай мектептерде еліміздегі оқушылардың 5%-дан азы ғана білім алғанымен, олар NU студенттерінің 80%-дан астамын құрайды. Көпфакторлы талдау нәтижелері басқа факторлар тұрақты болған жағдайда, іріктелген орта мектептердің түлектерінің Назарбаев Университетіне түсу ықтималдығы жалпы білім беретін мектеп түлектерімен салыстырғанда 2–4 пайыздық тармаққа жоғары екенін көрсетті. Жалпы білім беретін мектептердің түлектерінің небәрі 0,2%-ы ғана NU-ға түсетінін ескерсек, бұл көрсеткіш мамандандырылған мектеп түлектерінің университетке түсу ықтималдығы шамамен 8–20 есе жоғары екенін білдіреді. Зерттеу нәтижелері Қазақстанның жетекші университетіне қолжетімділіктің негізінен мамандандырылған орта мектептердің түлектері арасында шоғырланғанын және қолданыстағы қабылдау жүйесі жинақталған білім беру артықшылықтарын қайта өндіруі әрі жоғары білімдегі тік стратификацияны күшейтуі мүмкін екенін көрсетеді. Сонымен қатар, бұл зерттеу формалды түрде меритократиялық қағидаттарға негізделген жүйелердің өзінде де мамандандырылған орта мектептердің элиталық университеттерге қолжетімділікті айқындауда маңызды рөл атқаратынын көрсете отырып, білім берудегі теңсіздік туралы халықаралық ғылыми пікірталасқа үлес қосады. Зерттеу нәтижелері таңдаулы жоғары оқу орындарына қолжетімділіктегі дайындық және ақпараттық теңсіздіктерді азайту үшін ерте кезеңнен басталатын әрі нысаналы мемлекеттік саясат шараларының қажеттілігін айқындайды.

Түйін сөздер: білім берудегі теңсіздік; жоғары білімге қолжетімділік; элиталық жоғары білім; Қазақстан; Назарбаев Университеті.

Introduction

Ensuring equitable access to higher education, particularly to the most selective and prestigious “elite” institutions, remains a central challenge for education systems worldwide (Triventi, 2013; Wang, 2023). Although governments increasingly emphasize equity in higher education participation (Jordan, 2010), higher education systems continue to grapple with the competing demands of quality, equity, and sustainability (Nurshatayeva & Page, 2020; Unterhalter & Carpentier, 2010). Moreover, despite mass expansion of higher education, access to elite universities remains highly stratified, with students from more advantaged socioeconomic backgrounds disproportionately represented among those admitted and enrolled (Boliver, 2013; Raffe & Croxford, 2015). These enduring disparities have fueled ongoing debates about the fairness and legitimacy of admissions processes at highly selective universities and, more broadly, about the extent to which higher education systems promote opportunity or reproduce existing social inequalities (Clancy & Goastellec, 2007; McCowan, 2016).

Meritocracy remains the dominant principle underpinning admissions to highly selective universities (Boliver & Powell, 2023). Yet a substantial body of research suggests that prevailing definitions of merit often reflect unequal distributions of cultural, linguistic, and academic capital rather than neutral assessments of ability alone (Boliver et al., 2022; Bourdieu, 1986). Indeed, educational researchers have extensively documented that family socioeconomic resources can be translated into concrete admissions advantages through access to higher-quality schools, test

preparation, educational guidance, and other forms of support (Alon, 2009; Baikenov & Shamatov, 2025; Farid et al., 2021).

Kazakhstan provides a particularly informative setting in which to examine access to elite higher education. One of the country's most ambitious educational initiatives since independence¹ has been the creation of Nazarbayev University (NU), a research-intensive institution designed to become a globally competitive “world-class” university and to educate the nation's most talented students (Ruby, 2017). NU receives a disproportionately large share of Kazakhstan's public higher education funding (Organisation for Economic Co-operation and Development [OECD], 2017; Varantola et al., 2017), and more than 95% of admitted students receive publicly funded scholarships covering full tuition and fees along with a stipend for living expenses (NU, 2026). Access to NU therefore represents not only admission to the country's most selective university but also access to a substantial public investment.

At the same time, in recent decades, Kazakhstan has invested heavily in networks of highly selective public secondary schools, most notably Nazarbayev Intellectual Schools and Bilim-Innovation Lyceums, that emphasize advanced STEM and English-language preparation (Yakavets, 2014). These schools select students based on their internal admissions exams, utilize internationally oriented curricula and pedagogical practices, and provide opportunities for advanced coursework aligned with international standards such as Advanced Placement and International Baccalaureate. They place a particular emphasis on developing students' English-language proficiency² and encourage participation in international academic competitions.³ In other words, these schools cultivate forms of academic, linguistic, and cultural capital that closely align with the admissions requirements of NU and other highly selective universities (Baikenov & Shamatov, 2025; Hwami & Bedeker, 2024; Kemelbayeva & Kurmanov, 2024). Consequently, graduates of these institutions may enter the university admissions process with advantages not equally available to students attending mainstream schools.

Examining access to elite higher education in Kazakhstan—and to NU in particular—is important both conceptually and empirically. Although a large international literature has documented inequalities in access to elite higher education (Boliver, 2013; Chankseliani et al., 2020; Prakhov, 2016), comparable national-level analyses remain rare in Central Asia and the post-Soviet region. Existing studies have generally relied on limited or nonrepresentative samples and have not systematically linked student- and school-level characteristics to enrollment outcomes at elite universities. As a result, relatively little is known about how educational opportunities are distributed within these systems.

¹ Like other countries of the former Soviet Union, Kazakhstan gained independence after the collapse of the USSR in 1991.

² The languages of instruction in Kazakhstan's education system are primarily Kazakh and Russian, with most students receiving schooling in one of these two languages. English is a compulsory subject. In some selective and private schools, English is used as a language of instruction for selected subjects or programs.

³ Participation in academic competitions (commonly referred to as Olympiads) is formally voluntary but strongly encouraged in selective schools, where high-performing students often receive specialized preparation and coaching. Success in these competitions can yield benefits at multiple levels, including admissions advantages for students, professional recognition for teachers, and enhanced prestige for schools.

The question is also highly relevant for policy. Given the substantial public funding devoted to NU, understanding who gains access is critical for evaluating whether public investments promote educational opportunity broadly or concentrate it among students who have already benefited from selective educational pathways. Documenting patterns of access is therefore a necessary first step toward assessing whether equity-focused policy interventions are needed.

To contribute to the literature on access to elite higher education in the region and to inform policy decisions, we use national administrative data on the universe of secondary school graduates in Kazakhstan between 2021 and 2023 ($N = 499,150$) and examine the following research question: *What individual- and school-level characteristics predict enrollment at Nazarbayev University?* We focus in particular on the role of sociodemographic characteristics, family socioeconomic background, academic achievement, secondary school type, and school-level characteristics.

Previewing the results, we find that the most salient factor predicting access to NU is being a graduate of a selective public secondary school such as Nazarbayev Intellectual Schools or Bilim-Innovation Lyceums. Other individual characteristics and even school-level factors are either not significantly associated with NU enrollment or demonstrate relationships with it that are small in magnitude and therefore have small practical significance.

These findings raise both empirical and normative concerns as they suggest that the considerable public investment Kazakhstan continues to make in its highly selective secondary and postsecondary education institutions may contribute to heightened educational stratification and inequality. The results underscore the need for targeted policy interventions to promote more equitable access to NU, ensuring that academically talented students attending regular urban and rural schools are not systematically disadvantaged in their pursuit of world-class higher education opportunities. More broadly, these patterns prompt important questions about the long-term consequences of unequal access to elite educational pathways for social mobility and societal well-being.

The remainder of the paper proceeds as follows: We first present the theoretical framework and review the relevant literature. We then describe the Kazakhstani educational context, data, and methods, followed by the results. In the final sections, we reflect on the findings and offer some concluding thoughts.

Theoretical Framework

This study is grounded in Bourdieu's theory of social reproduction, particularly his work on cultural and social capital and the role of educational institutions in the conversion and certification of these resources (Bourdieu, 1977, 1986). From this perspective, educational systems are not neutral mechanisms of talent identification but structured fields in which advantage is accumulated, transformed, and legitimized through institutional processes.

At the individual level, students enter the educational system with unequal economic, cultural, and social resources. Characteristics such as socioeconomic background, gender, language, and place of residence reflect the types of social and cultural capital available to students and their families. The differences in resources can influence educational trajectories by affecting access to academic opportunities, information about selective pathways, and the dispositions and competencies that

are rewarded within educational institutions. Consequently, individual characteristics may be associated with the likelihood of gaining admission to highly selective institutions such as NU.

At the same time, Bourdieu emphasizes that educational institutions play a central role in reproducing and legitimizing social inequalities. Schools do not merely reflect pre-existing differences among students; they actively shape the acquisition, development, and recognition of valued forms of capital. Beyond the transmission of academic knowledge, schools provide varying levels of access to rigorous curricula, preparation for high-stakes assessments, institutional guidance, and information about educational opportunities. As a result, schools can influence which students are positioned to compete successfully for admission to selective universities.

Notably, this framework does not presuppose the relative importance of individual versus institutional factors, but instead motivates their joint empirical examination. Accordingly, our analyses examine the extent to which NU enrollment is associated with both individual student characteristics and the secondary school contexts through which educational opportunities are structured.

Literature Review

A substantial body of research shows that access to elite and highly selective universities is shaped by cumulative advantages associated with family background, schooling environments, and geography (Boliver, 2013; Chankseliani et al., 2020; Prakhov, 2016). Indeed, evidence from a wide range of countries demonstrates the persistent underrepresentation of students from less advantaged backgrounds in prestigious universities, including the Russell Group universities in the United Kingdom (Boliver, 2013; Woodward, 2020), selective four-year colleges in the United States (Hill & Winston, 2010; Reardon et al., 2012; Shamash, 2018), the French *grandes écoles* (Herbaut, 2022), elite universities in China (Wen et al., 2023), and highly selective postsecondary institutions in Australia (Jerrim et al., 2015). These patterns suggest that formally merit-based admissions systems often operate within broader structures of educational inequality.

Evidence on the relationship between attending a selective or academically oriented secondary school and enrollment in elite universities is inconclusive. While correlational studies show that attending a more selective secondary school is associated with improved chances of getting into elite universities in the United Kingdom (Mansfield, 2019), China (Lee & Wright, 2016), and Russia (Prakhov, 2016), in many of the extant correlational studies, findings are sensitive to model specification. Indeed, once prior academic achievement and student background characteristics are taken into account, estimated advantages associated with selective schools are often substantially reduced (Lu, 2021; Lu & Siddiqui, 2024).

Furthermore, studies employing rigorous causal designs suggest that attending a highly selective secondary school has no effect on postsecondary outcomes. For example, using a regression discontinuity design, Dobbie and Fryer (2011) find that attendance at highly selective exam schools in New York City has no effect on postsecondary enrollment or degree completion. Using a similar set-up of a regression discontinuity design, Clark (2010) finds only suggestive and imprecisely estimated effects of attending grammar schools on university enrollment in England. Together, these findings suggest that selective schools may function less as generators of

advantage than as institutions that concentrate students who have already accumulated educational advantages.

Nevertheless, a consistent empirical finding across contexts is the disproportionate underrepresentation of socioeconomically disadvantaged students in elite higher education institutions (Shamash, 2018). Whether this pattern reflects school effects, individual selection, or some combination of the two, existing research suggests that access to elite higher education is strongly structured across socioeconomic lines.

Despite growing literature on access to elite higher education, evidence remains concentrated in countries with long-standing market economies and highly stratified systems of educational opportunity. Formerly Soviet contexts remain largely absent from research on access to elite higher education. It is therefore unclear whether patterns documented in Western Europe, North America, and East Asia extend to countries that inherited educational systems shaped by decades of state-led commitments to universal access and relatively egalitarian provision, but that have more recently introduced selective secondary and postsecondary institutions. This study addresses this gap by providing the first national-level analysis of the predictors of access to Kazakhstan's most selective postsecondary institution, Nazarbayev University.

Study Context

Nazarbayev University: The “Apex” of Selective Higher Education in Kazakhstan

In recent decades, Kazakhstan has invested heavily in the development of a selective higher education sector. For example, as the country transitioned from a centrally planned to a market-based economy in the early post-Soviet 1990s, it established what are now KIMEP University and SDU University, selective private institutions designed to train students for newly emerging sectors of the economy. Later, in the 2000s, the state founded the highly selective Kazakh-British Technical University, which introduced dual-degree programs in partnership with leading western institutions, including the London School of Economics (Hartley & Ruby, 2025). Collectively, these developments reflected broader efforts to modernize higher education and cultivate highly skilled human capital.

Among these institutions, NU occupies a distinctive position that can be described as the “apex” of Kazakhstan's higher education system. Established in 2010 as an English-medium, research-intensive university, NU was created as a flagship institution intended to become a “world-class” university and to advance Kazakhstan's ambition of developing a globally competitive higher education sector (Ruby, 2017). Unlike most public universities, NU operates with substantial autonomy from the Ministry of Science and Higher Education and has independent authority over admissions, curriculum, and academic programming. Supported by sustained public investment, the university has developed extensive international partnerships, recruited faculty from around the world, and adopted academic standards modeled on leading research universities (Hartley & Ruby, 2025; Katsu & Saniyazova, 2018).

NU's admissions system further distinguishes it from the rest of Kazakhstan's higher education sector. Whereas admissions to most universities are based primarily on performance on the

nationwide centralized Unified National Test (Nurshatayeva et al., 2026), NU employs a separate process centered on internationally recognized assessments, including IELTS/TOEFL, the SAT, and its own institutional entrance examination, the NU Entrance Test, or NUET.⁴ Admitted students are therefore expected to demonstrate not only strong academic achievement but also advanced English-language proficiency and familiarity with testing formats that are uncommon in much of the country's secondary education system. In recent years, admitted students averaged IELTS scores of 6.7 in the Foundation Program⁵ and 7.2 in undergraduate programs, and SAT scores of admitted students averaged 1385 points (NU, 2026).

Between 2021 and 2023, NU enrolled approximately 1,300 new students annually, including roughly 700 undergraduate students and 600 Foundation Program students. As of 2026, total enrollment stands at approximately 8,000 students, with undergraduate and Foundation Program students accounting for nearly three-quarters of the student body.

Secondary School Stratification in Kazakhstan

Kazakhstan's contemporary secondary education system is built on institutional foundations inherited from the Soviet period, including universal access to schooling, high literacy rates, a qualified teaching workforce, and a centralized curriculum. Most students attend regular public schools, which are publicly funded and follow the national curriculum. However, educational opportunities vary substantially across school contexts. Urban schools tend to be larger and have greater proximity to universities, supplementary educational services, test-preparation markets, and information networks related to higher education. Rural schools serve more geographically dispersed populations and often face constraints in access to specialized teachers, advanced coursework, English-language instruction, and university admissions guidance (Bray, 2023; Hajar & Karakus, 2025). Multigrade schools, which primarily serve small and remote rural communities, constitute a particularly resource-constrained segment of the education system.

Alongside maintaining broad access to schooling, in recent decades, Kazakhstan has invested heavily in the development of highly selective secondary schools (Kemelbayeva & Kurmanov, 2024; Yakavets, 2014). Despite differences in governance and pedagogical approach, these schools share several defining features: They are publicly funded, admit students through competitive examinations, provide enriched academic programs, emphasize STEM and foreign-language preparation, and maintain strong traditions of preparing students for academic competitions and selective university admissions. Policymakers have sought to reduce geographic barriers to attending these schools by locating them in regional capitals and major cities, including Astana, Almaty, and Shymkent. Furthermore, many operate boarding facilities, enabling students from rural and remote areas to enroll if admitted. As a result, the selective-school system combines highly competitive entry requirements with broad territorial reach.

⁴ In 2024, NU introduced an additional admissions pathway based on the Unified National Test; however, this track is available only on a fee-paying basis.

⁵ The Nazarbayev University Foundation Year Program (NUFYP) is a one-year preparatory program that equips students with academic and study skills in areas such as English and mathematics. Successful completion provides a pathway to undergraduate admission at Nazarbayev University and satisfies the additional year of schooling often required for study abroad.

The largest and most visible network of such schools is the Nazarbayev Intellectual Schools (NIS), established in 2008 as a system of selective STEM-oriented schools intended to serve as laboratories for educational innovation and system-wide reform (Shamshidinova et al., 2014; Yakavets, 2014). NIS schools employ internationally oriented curricula, maintain partnerships with global educational organizations, and receive substantially higher levels of funding than regular public schools.⁶ Another prominent network is the Bilim-Innovation Lyceums (BIL), a system of 36 academically selective schools established in the early 1990s. BIL schools are known for their strong STEM and academic competition preparation, as well as their emphasis on values-based education (Makhmetov, 2025; Zhussipbek, 2019). Other selective institutions include approximately 80 Daryn specialized schools, which serve academically gifted students, and the National Schools of Physics and Mathematics (Fizmat) in Astana and Almaty. Originally modeled on specialized mathematics and science boarding schools established during the Soviet era, these institutions continue to provide advanced instruction in mathematics and the natural sciences.

Methods

Data and Analytic Sample

For the current analysis, we use administrative data from Kazakhstan's National Education Database, maintained by the Tal dau National Center for Education Research and Evaluation of the Ministry of Education. Using unique student identifiers, we link individual-level records from four administrative datasets: (1) a school characteristics dataset containing institutional information on all secondary schools; (2) a student-level dataset including records for all secondary school graduates; (3) a higher education institution characteristics dataset with information on universities; and (4) a student-level dataset including records for all postsecondary enrollees.

The analytic sample includes all students graduating from secondary school in 2021, 2022, and 2023. This period represents the only timeframe for which administrative records on both secondary school completion and university enrollment are available and can be linked. After listwise deletion of cases with missing values on independent variables, the final analytic sample consists of 499,150 observations, representing 99.56% of the original raw data. Given the very low rate of missingness and the absence of systematic variation in missing data across school types, listwise deletion is unlikely to introduce meaningful bias.⁷

Variables

The *dependent variable* is enrollment at Nazarbayev University, coded as a binary indicator (1 = enrolled at NU; 0 = not enrolled at NU).⁸

⁶ In 2020, NIS received 2.7% of total national education expenditures while educating only 0.4% of the secondary student population (The World Bank, 2023).

⁷ Our data do not include international students since they complete their secondary schooling outside Kazakhstan and by default do not appear in the country's secondary education database. This does not pose threats to internal validity of the study since enrollment in NU during this period was overwhelmingly domestic (Hartley & Ruby, 2025).

⁸ National university enrollment records do not distinguish between NU's Foundation program and four-year bachelor's degree programs. As a result, the outcome variable should be interpreted as enrollment at NU broadly rather than as enrollment in a specific NU program pathway.

School type is operationalized using 12 indicator variables capturing the main institutional categories of secondary schools in Kazakhstan; this is consistent with prior research on educational stratification and institutional differentiation within the country's schooling system (Kemelbayeva & Kurmanov, 2024; Yakavets, 2014). Regular *urban public schools* constitute the modal school type in the sample. *Rural public schools* are identified using administrative geographic codes. *Multigrade schools* (or ungraded schools) are defined, following legislative criteria, as schools with enrollments of fewer than 180 students. *Gymnasiums and lyceums* are specialized public schools offering enhanced curricula. *Private schools* are those privately owned and following the national curriculum. *International schools* are branches of international school networks or privately owned schools following international curricula (e.g., Haileybury Almaty school). Selective schools are presented via indicators for *NIS*, *BIL*, *Fizmat*, *IQanat Burabay Schools*, *Daryn schools*, and an indicator for all *other selective institutions*.

Academic achievement is captured using two indicators from secondary school completion records. The first distinguishes between *standard high school diplomas* and *diplomas with honors* awarded for high academic performance. The second identifies recipients of the *Altyn Belgi* medal, the highest academic award in Kazakhstan's secondary education system.

Gender is captured using an indicator variable for *female* students. *Language of instruction* is operationalized through indicators distinguishing *Kazakh*, *Russian*, *English*, and *other languages of instruction*.

Family socioeconomic status (SES) is measured using a set of binary variables reflecting household resources, following international approaches that conceptualize SES as a composite construct rather than a single indicator (OECD, 2024). These include receipt of government-provided, means-tested *social assistance*, *orphan status*, *access to high-speed internet at home*, and *ownership of digital devices* (smartphones, computers, laptops, tablets).⁹

School-level predictors include a *teacher quality index* measured as the share of highly qualified and experienced teachers among total teaching staff. Additional predictors capture *average class size*, *total student enrollment*, and *total number of teachers*, which together proxy school size and instructional capacity.

Geographic variation is captured using indicators for Kazakhstan's macro-regions (*North*, *South*, *East*, and *West*), as well as additional indicators for *Astana* (the capital city) and *Almaty* (the largest city).

Empirical Specification

The analysis employs a logistic regression model estimated via maximum likelihood (Agresti & Finlay, 2009; Angrist & Pischke, 2009). For student i attending school s , the model is specified as:

$$\ln(\pi_i / (1 - \pi_i)) = \alpha_0 + \beta X + \varepsilon_i$$

⁹ Because the data are drawn from administrative records rather than from a survey instrument, the available socioeconomic indicators are limited to those collected by schools for administrative purposes. As a result, more detailed measures of family background—such as parental education, occupation, or household income—are not available in the dataset. The proxy variables used here capture only selected dimensions of household SES, and readers should interpret the SES coefficients with this constraint in mind.

where $\pi_i = P(\text{NU}_i = 1 \mid \mathbf{X}_i)$ represents the probability that student i enrolls at Nazarbayev University and $\mathbf{X}$ is the full vector of covariates described above. Standard errors are clustered at the school level to account for within-school correlation in students' outcomes.

To facilitate interpretation, for each coefficient β associated with the predictors, we report average marginal effects (AMEs) rather than log-odds coefficients. AMEs represent the average change in the predicted probability of NU enrollment associated with a one-unit change in each predictor (Agresti & Finlay, 2009; Angrist & Pischke, 2009). This approach provides coefficients directly interpretable as percentage-point changes in enrollment probability, analogous to linear probability model coefficients but with the empirical advantages of the logistic specification.¹⁰

Results

Descriptive Statistics

Table 1 presents descriptive statistics. Of all secondary school graduates in the sample, only 3,364 (approximately 1%) subsequently enrolled at NU, underscoring both the institution's selectivity and the highly competitive nature of access to NU.

The descriptive statistics also reveal a secondary education system characterized by substantial institutional differentiation. Nearly four in five graduates attended regular public schools, split almost evenly between urban (43%) and rural (39%) settings. By contrast, only about 5% of students attended selective schools, such as NIS, BIL, Fizmat, Daryn, and IQanat Burabay schools. The remaining graduates were distributed across gymnasiums and lyceums (5%), multigrade (5%), private (3%), and international (0.2%) schools. On average, schools served approximately 1,177 students, employed 146 teachers, and maintained an average class size of 20 students. Across schools, approximately 4% of teachers held the highest qualification category.

Students in the sample also varied considerably in their academic credentials and demographic backgrounds. While approximately 10% had graduated with honors diplomas and 1% had earned the prestigious Altyn Belgi medal, the majority of graduates (89%) received ordinary diplomas. Females constituted a slight majority of graduates (53%). Most students attended Kazakh-language schools (70%), while 27% graduated from Russian-language schools and roughly 3% studied in English or other languages.

Indicators of family resources suggest that many students had access to basic technological infrastructure, although important disparities remained. Most came from households with high-speed internet access (88%). However, access to computing devices was less universal: While 54% reported access only to a smartphone but had no computer or laptop, just 34% had access to a computer or laptop in addition to a smartphone. Relatively small shares of students came from economically or socially vulnerable backgrounds, with approximately 2% living in households receiving government welfare payments and less than 1% identifying as orphans.

¹⁰ The logistic model ensures predicted probabilities remain bounded within the [0,1] interval and accounts for the nonlinear relationship between predictors and probability, which is particularly relevant given the binary dependent variable.

Nazarbayev University Within Kazakhstan's Postsecondary Access Landscape

To contextualize NU enrollment within Kazakhstan's broader higher education access landscape, we present additional descriptive statistics. Specifically, Table 2 reports enrollment rates in any higher education institution alongside enrollment in NU, disaggregated by secondary school type. Overall, 56% of graduates enroll in any university in Kazakhstan, while only 1% enroll at NU. Enrollment in any university varies moderately across school types, clustering around the mid-50% range for graduates of urban public schools (56%), rural public schools (52%), and multigrade schools (51%); enrollment is somewhat higher for gymnasium/lyceum graduates (63%) and private school graduates (72%). Selective secondary schools exhibit similarly high or slightly higher overall university enrollment rates.¹¹

In contrast, NU enrollment is highly concentrated among a small set of elite secondary schools. The highest shares are observed among graduates of NIS schools (27%), followed by Fizmat (24%), IQanat Burabay (11%), and BIL schools (8%), with other selective schools also showing elevated but more modest rates. By comparison, NU enrollment is virtually nonexistent among graduates of mainstream public schools (0.2% in urban schools and 0.01% in rural and multigrade schools), as well as among gymnasiums/lyceums (0.6%), and private schools (0.3%).

We further examine the composition of NU students by secondary school type in Figure 1. The distribution reveals a striking concentration of selective-school graduates, who account for nearly 80% of NU students. NIS schools alone comprise 53% of all NU students, followed by BIL schools at 11% and Fizmat at 7%; together, these schools account for 71% of NU enrollment.

In sharp contrast, students from mainstream school types are minimally represented at NU. Urban public schools, which serve 43% of all students nationally, account for only 12% of NU enrollees. Rural public schools, despite educating 39% of graduates nationwide, contribute less than 1% of NU students. Multigrade schools account for fewer than 0.1% of students admitted to NU.

Predictors of NU Enrollment

Table 3 reports regression results. In alignment with descriptive statistics, the most striking pattern in the results is the overwhelming importance of secondary school type. Across specifications, school type emerges as by far the strongest predictor of NU enrollment, with large and systematically patterned coefficients across institutional categories. In contrast, academic achievement, sociodemographic characteristics, and most measured school resources exhibit comparatively small or substantively modest associations once school type is taken into account.

Turning briefly to these other predictors, the results indicate that individual academic achievement is positively associated with NU enrollment but the coefficient is small in magnitude. Both honors diplomas and the Altyn Belgi medal are statistically significant predictors of enrollment; however, their coefficients are again small, especially relative to school-type coefficients. Female students and Russian-language instruction show slightly lower probabilities of NU enrollment, yet coefficients imply limited practical significance. Family socioeconomic indicators show little systematic association with NU enrollment. Likewise, school-level structural characteristics,

¹¹ Additional analyses (available upon request) indicate that approximately 20% of graduates from regular public schools pursued vocational training after high school, compared with only 1% of graduates from selective secondary schools.

including teacher qualifications, class size, and school size, explain little variation in the outcome variable. Taken together, these estimates suggest that observable individual and school resource differences do not account for the large disparities in access to NU once the type of school that students attended is considered.

Against this backdrop, school-type differences are both large in magnitude and strongly ordered. The largest coefficient is observed for graduates of NIS schools, who are 3.57 percentage points more likely to enroll at NU than comparable students from regular urban public schools, *ceteris paribus*. Given a baseline NU enrollment rate of 0.20% among urban public school graduates, this corresponds to nearly a twentyfold higher probability of NU enrollment for NIS graduates.

Other selective schools exhibit similarly large advantages. Graduation from Fizmat schools is associated with a 2.83 percentage-point increase in NU enrollment (approximately a fifteenfold higher probability relative to urban public school graduates). Coefficients for BIL and IQanat Burabay schools are 2.14 percentage points each, corresponding to roughly elevenfold higher probability of NU enrollment compared to ordinary public school student graduates. Graduates of Daryn schools (1.49 percentage points) and other selective schools (1.36 percentage points) also display substantial advantages, translating into approximately seven- to eightfold higher probability of NU enrollment relative to the ordinary urban public school graduates.

International schools likewise show elevated probabilities of NU enrollment. Attendance at these schools is associated with a 1.68 percentage-point increase in NU enrollment, or approximately a ninefold higher probability relative to urban public school graduates. Gymnasiums and lyceums exhibit more modest but still statistically significant associations (0.50 percentage points), corresponding to roughly a threefold higher probability compared to mainstream public schools. By contrast, private schools show no statistically significant relationship with NU enrollment.

At the other end of the distribution, rural and multigrade schooling is consistently associated with lower probabilities of NU enrollment. Attending a rural public school is associated with a 1.08 percentage-point decrease in enrollment probability, while multigrade schools are associated with a 1.18 percentage-point decrease relative to urban public schools. Given the already extremely low baseline rate of enrollment, these estimates imply that graduates of rural and multigrade schools face effectively near-zero probabilities of enrolling at NU, even when they have comparable academic achievement and observable family and school characteristics as their urban public school counterparts.

Discussion and Conclusions

This study examines individual- and school-level predictors of enrollment at NU, Kazakhstan's most selective higher education institution. The findings demonstrate the centrality of attending selective schools as a predictor of access to NU and show the comparatively limited explanatory power of individual- and other school-level characteristics. Findings show pronounced concentration of NU enrollment among graduates of selective secondary schools. Although these schools educate only a small fraction of Kazakhstan's secondary school population (around 5%), they account for over 80% of NU enrollees. In particular, graduates of three state-funded selective secondary school networks (NIS, BIL, and Fizmat) comprise 71% of all students admitted to NU between 2021 and 2023, despite collectively producing only about 2.2% of secondary school

graduates nationally. By contrast, graduates of rural and multigrade schools represent approximately 44% of all secondary school graduates but account for fewer than 1% of NU enrollees.

The findings suggest that selective schools structure access to later opportunities within Kazakhstan's educational system, operating as a powerful sorting mechanism (Bourdieu, 1977, 1986; Domina et al., 2017). Merit-based selection into NU thus functions as an integral component of the stratified educational system, reproducing inequalities that are both socially patterned and institutionally reinforced by favoring students whose prior schooling aligns with institutional expectations (Bourdieu, 1986; Reay, 2017). As a result, stratification becomes increasingly concentrated at the top of the system, where access is shaped by early placement into selective educational pathways embodied by selective public schools (Gamoran, 2009). In other words, NU predominantly admits students whose trajectories are effectively set long before university application.

Importantly, the strong association between school type and NU enrollment should not be read as the causal effect of attending these institutions. Because admission to selective schools such as NIS and BIL is itself competitive and shaped by students' earlier academic preparation and family resources, attendance largely marks students who have already accumulated educational advantages. This interpretation is consistent with quasi-experimental evidence that selective schools exert limited independent effects on postsecondary outcomes (Clark, 2010; Dobbie & Fryer, 2011). Selective schools appear to concentrate, certify, and convert pre-existing advantage into access to elite higher education rather than generate that advantage themselves (Bourdieu, 1986).

Our findings also contribute to longstanding debates on the relative importance of family background and school resources in shaping educational inequality. The Coleman Report (Coleman et al., 1966) argued that family and social background are stronger predictors of educational outcomes than measurable school characteristics, a conclusion echoed in subsequent work emphasizing socioeconomic conditions outside of school (Downey & Condron, 2016; Jencks, 1972; Reardon, 2011; Sirin, 2005). The present study extends this literature by showing that, in Kazakhstan, while family socioeconomic background remains relevant, school type plays a particularly consequential role in shaping access to elite higher education.

The findings should also be interpreted within Kazakhstan's broader policy commitment to establishing a world-class research university. NU was explicitly designed as a highly selective, English-medium, research-intensive institution intended both to compete internationally and to serve the country by educating its most talented students (Hartley & Ruby, 2025). Our findings highlight the narrow operational definition of "talent" implied by observed enrollment patterns. In practice, the talent recognized through NU admissions is closely tied to prior access to specific educational opportunities and forms of cultural capital, including advanced English proficiency, familiarity with standardized testing regimes, and exposure to elite academic pathways. Students from rural and mainstream urban schools are not inherently less capable or less talented; rather, they are less likely to have had access to the preparatory resources that NU's admissions system rewards. As a result, NU's admissions inadvertently concentrate access among students already

embedded in selective schooling pathways, rather than fully identifying and cultivating talent across the broader population of Kazakhstan's youth.¹²

While some degree of exclusivity is inherent to the mission of a world-class university (Salmi, 2009), equity concerns are particularly salient in the Kazakhstani context because both NU and the selective secondary schools that supply the majority of its students are heavily publicly funded. As a result, public resources simultaneously support the institutions that generate the forms of capital rewarded in elite admissions and the university that ultimately certifies and rewards them. This creates a system in which publicly financed educational investments disproportionately translate into access to a narrow set of elite opportunities. In other words, the architecture of the system risks channeling public investment in ways that reproduce rather than offset early inequalities. The findings therefore suggest that Kazakhstan's strategy for promoting educational excellence needs to be accompanied by a stronger commitment to equity, particularly in ensuring that access to elite higher education is not primarily determined by prior placement into selective schooling pathways.

The findings point to two policy implications. First, NU and higher education policymakers should strengthen recruitment and outreach strategies to ensure that informational and preparatory barriers do not prevent qualified students outside the selective school networks from applying. Second, education policymakers and secondary school leaders should critically examine application and selection processes into selective schools such as NIS and BIL to ensure broader sociodemographic representation. Proactive outreach and information campaigns, coupled with targeted support for preparing for admission to selective secondary schools, could serve as an effective lever for broadening the pool of NU applicants (Dynarski et al., 2023; Page & Nurshatayeva, 2022).

Finally, this study highlights several directions for future research. Longitudinal research tracing student trajectories from primary schooling through university enrollment and completion would deepen understanding of when and how barriers to postsecondary access are formed and should be addressed. Further research is also needed on the application to, preparation for, and admission into exam-based selective schools such as NIS and BIL, where much of the stratification observed in this study appears to originate. Finally, causal research examining the effects of attending elite universities like NU on labor market outcomes and nonmonetary outcomes, such as residence in Kazakhstan and civic engagement, would deepen our understanding of the long-term private and social returns to public investment in world-class universities such as NU.

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¹² Recent improvements in NU's international ranking performance (Times Higher Education, 2025) may further reinforce incentives to maintain these selectivity standards as markers of excellence and global competitiveness.

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Tables and Figures

Table 1

Descriptive statistics (N = 499,150)

Variable	Mean	(SD)
Enrolled in NU	0.01	(0.08)
School type:		
Urban public school	0.43	(0.49)
Rural public school	0.39	(0.49)
Multigrade	0.05	(0.22)
Gymnasium / lyceum	0.05	(0.22)
Private school	0.03	(0.17)
NIS	0.01	(0.11)
BIL	0.01	(0.10)
International school	0.002	(0.05)
Daryn	0.002	(0.05)
Fizmat	0.002	(0.04)
IQanat Burabay	0.001	(0.03)
Other selective school ^a	0.02	(0.15)
High school diploma with honors	0.10	(0.30)
Altyn Belgi medal	0.01	(0.11)
Female	0.53	(0.50)
Language of instruction:		
Kazakh	0.70	(0.46)
Russian	0.27	(0.44)
English	0.001	(0.03)
Other	0.03	(0.19)
Family socioeconomic status:		
Has high-speed internet access at home	0.88	(0.33)
Has smartphone only (no PC / laptop / tablet)	0.54	(0.50)
Has PC / laptop / tablet	0.34	(0.48)
Family receives government financial assistance	0.02	(0.15)
Orphan	0.002	(0.04)
School characteristics:		
Teacher quality index	0.04	(0.06)
Average number of students per classroom	20	(17)
Total students	1,177	(895)
Total teachers	146	(77)
Astana/Almaty	0.14	(0.35)

North	0.16	(0.37)
West	0.16	(0.37)
South	0.48	(0.50)
East	0.05	(0.23)

^a “Other selective school” category includes all schools with exam-based admissions except for NIS, BIL, Fizmat, Daryn, and IQanat Burabay schools.

Table 2

Higher education enrollment rates across school type (N = 499,150)

School type	N	% enrolled in any higher education institution in Kazakhstan	% enrolled in NU
Urban public school	215,727	56	0.2
Rural public school	192,478	52	0.01
Multigrade	25,381	51	0.01
Gymnasium / lyceum	24,274	63	0.6
Private school	14,136	72	0.3
Other selective school ^a	12,120	77	2
NIS	6,448	69	27
BIL	4,902	74	8
International school	1,201	32	4
Daryn	1,175	84	3
Fizmat	988	60	24
IQanat Burabay	320	78	11
All schools	499,150	56	1

^a “Other selective school” category includes all schools with exam-based admissions except for NIS, BIL, Fizmat, Daryn, and IQanat Burabay schools.

Table 3

Predictors of NU enrollment (N = 499,150)

Variable	Coef.	(SE)
School Type:		
Rural public school	−1.08***	(0.20)
Multigrade	−1.18***	(0.43)
Gymnasium / lyceum	0.50***	(0.12)
Private school	0.17	(0.16)
NIS	3.57***	(0.44)
BIL	2.14***	(0.28)
International school	1.68***	(0.34)
Daryn	1.49***	(0.29)

Fizmat	2.83***	(0.39)
IQanat Burabay	2.14***	(0.28)
Other selective school	1.36***	(0.21)
High school diploma with honors	0.71***	(0.07)
Altyn Belgi medal	0.87***	(0.09)
Female	−0.11***	(0.03)
Language of instruction:		
Russian	−0.18***	(0.04)
English	−0.06	(0.28)
Other	0.04	(0.37)
Family socioeconomic status:		
Has high-speed internet access at home	−0.01	(0.08)
Has smartphone only (no PC / laptop / tablet)	−0.07	(0.07)
Has PC / laptop / tablet	0.17**	(0.07)
Family receives government financial assistance	−0.26	(0.18)
Orphan	0.22	(0.29)
School characteristics:		
Teacher quality index	0.02	(0.44)
Average number of students per classroom	−0.00	(0.00)
Total students	0.00***	(0.00)
Total teachers	−0.00***	(0.00)
Geographic region:		
North	−0.17*	(0.09)
West	−0.20**	(0.08)
South	−0.29***	(0.09)
East	−0.23*	(0.13)

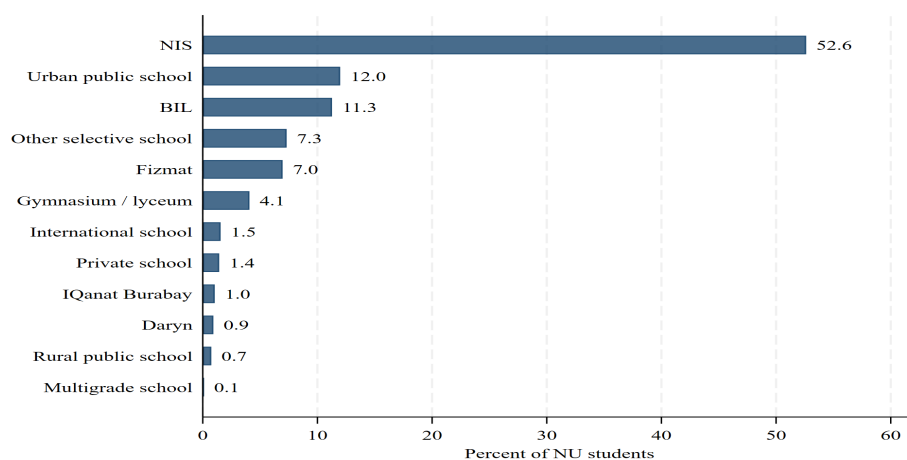
Note. Coefficients in percentage points from logistic regression (average marginal effects) with standard errors clustered by school. Reference category: male graduate of Kazakh-language urban public school in Astana/Almaty with ordinary high school diploma.

^a “Other selective school” category includes all schools with exam-based admissions except for NIS, BIL, Fizmat, Daryn, and IQanat Burabay schools.

* $p < 0.10$. ** $p < 0.05$. *** $p < 0.01$.

Figure 1

Distribution of NU students by secondary school type, 2021–2023 (N = 3,364)



Note. “Other selective school” category includes all schools with exam-based admissions except for NIS, BIL, Fizmat, Daryn, and IQanat Burabay schools.

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RESEARCH PAPER

Nazarbayev University undergraduate students' perceptions of their research preparedness: First steps into research capacity building

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Abstract Established in 2010 as Kazakhstan's flagship "world-class" research university, Nazarbayev University (NU) was designed to integrate research into undergraduate education and to contribute to the development of national research capacity. This study examines how NU's first cohorts of undergraduate students perceived their research preparedness and learns about intentions to pursue graduate study in their final year of the program. Drawing on the conceptualization of research preparedness as a multidimensional construct, the study explores students' learning motivation, perceptions of the research environment, research self-efficacy, research orientation, and the types of research activities they have undertaken. Results from an online cross-sectional survey administered to final-year undergraduate students across three NU schools in 2015 were analyzed descriptively. The findings indicate that students generally reported high levels of motivation, confidence in research-related skills, and positive perceptions of institutional research support. Most respondents expressed intentions to pursue graduate study. However, weaker perceptions of belonging to a research community and challenges related to self-regulation and time management were evident. No significant gender- or discipline-based differences were found in perceived research preparedness. Although limited by a small sample and self-reported measures, this study contributes to the higher education literature by documenting an early stage of undergraduate research capacity building in Kazakhstan and by offering a baseline snapshot of how national ambitions, which began at a single university, to cultivate research-ready graduates are translated into students' academic experiences.

Keywords: undergraduate students' research experience, research capacity, Nazarbayev University.

Аңдатпа 2010 жылы Қазақстанның «әлемдік деңгейдегі» жетекші зерттеу университеті ретінде құрылған Назарбаев Университеті (НУ) бакалавриат білім беру үдерісіне зерттеуді интеграциялау және ұлттық ғылыми-зерттеу әлеуетін дамыту мақсатында құрылды. Бұл зерттеу НУ-дың алғашқы бакалавриат түлектері өздерінің зерттеулік даярлығын қалай қабылдағанын және оқуын аяқтау кезеңінде магистратурада білім жалғастыру ниеттерін қарастырады. Зерттеулік даярлықты көпөлшемді құбылыс ретінде қарастыра отырып, зерттеу студенттердің оқу мотивациясын, зерттеу ортасын қабылдауын, зерттеуге қатысты өзіндік тиімділігін, зерттеу бағдарын және олардың қатысқан зерттеу түрлерін талдайды. 2015 жылы НУ-дың үш мектебінің соңғы курс студенттері арасында онлайн сауалнама жүргізіліп, деректер сипаттамалық тұрғыда талданды. Нәтижелер студенттердің жалпы алғанда жоғары мотивацияны, зерттеуге қатысты дағдыларына сенімділікті және институционалдық зерттеулік қолдауды оң қабылдауды көрсеткенін аңғартады. Респонденттердің басым бөлігі магистратурада оқуды жалғастыру ниеттерін білдірді. Алайда, зерттеу қауымдастығына тиесілілік сезімінің әлсіздігі және өзін-өзі реттеу мен уақытты басқаруға байланысты қиындықтар байқалды. Гендерлік немесе пәндік

айырмашылықтар тұрғысынан зерттеулік даярлықты қабылдауда елеулі айырмашылықтар анықталмады. Үлгінің шағындығы және өзіндік есеп беру деректерінің шектеулілігіне қарамастан, бұл зерттеу Қазақстандағы бакалавр деңгейіндегі зерттеулік әлеуеттің қалыптасуының ерте кезеңін құжаттап, зерттеуге дайын түлектерді даярлау жөніндегі ұлттық амбициялардың бір университет шеңберінде қалай жүзеге асып, студенттердің академиялық тәжірибелерінде қалай көрініс табатыны туралы бастапқы көрініс ұсына отырып, жоғары білім беру жөніндегі әдебиетке үлес қосады.

Түйінді сөздер: бакалавриат студенттерінің зерттеу тәжірибесі, зерттеу әлеуеті, Назарбаев Университеті.

Аннотация Основанный в 2010 году в качестве флагманского казахстанского исследовательского университета мирового уровня, Назарбаев Университет (НУ) был задуман как учреждение, интегрирующее исследования в бакалаврское образование и способствующее развитию национального исследовательского потенциала. Настоящее исследование рассматривает, как первые когорты студентов-бакалавров НУ воспринимали свою исследовательскую подготовленность и каковы их намерения поступать в магистратуру на завершающем этапе обучения. Опираясь на концептуализацию исследовательской подготовленности как многомерной конструкции, исследование анализирует учебную мотивацию студентов, их восприятие исследовательской среды, самоэффективность в исследовательской деятельности, исследовательскую ориентацию, а также виды исследовательской активности, в которых они участвовали. Результаты онлайн-опроса, проведенного среди студентов выпускного курса трех школ НУ в 2015 году, были проанализированы описательно. Полученные данные показывают, что студенты в целом продемонстрировали высокий уровень мотивации, уверенности в исследовательских навыках и положительное восприятие институциональной поддержки исследований. Большинство респондентов выразили намерение продолжить обучение в магистратуре. Однако были зафиксированы более слабые ощущения принадлежности к исследовательскому сообществу, а также трудности, связанные с саморегуляцией и управлением временем. Существенных гендерных или дисциплинарных различий в восприятии исследовательской подготовленности выявлено не было. Несмотря на ограничения, связанные с небольшим объемом выборки и использованием самоотчетных данных, данное исследование вносит вклад в литературу по вопросам высшего образования, документируя ранний этап формирования потенциала бакалаврских исследований в Казахстане и предлагая базовую картину того, как национальные амбиции по подготовке выпускников, готовых к исследовательской деятельности, зародившиеся в одном университете, отражаются в академическом опыте студентов.

Ключевые слова: исследовательский опыт студентов бакалавриата, исследовательский потенциал, Назарбаев Университет.

Introduction

The development of research and innovation capacity is widely recognized as a foundation for economic competitiveness and long-term national growth (Abylgazina & Mamaytazina, 2015; Bound & Lee, 2009; Shaw, Holbrook & Bourke, 2013). In many emerging systems, higher

education institutions are expected not only to prepare graduates for the labor market but also to generate new knowledge, drive technological advancement, and anchor national innovation agendas. Like other countries seeking to transition to knowledge-based development (Bastalich, 2010; Salmi, 2009; World Bank, 2000), Kazakhstan has explicitly linked the strengthening of research capacity to broader national priorities. Despite sustained reform efforts, concerns persist about the depth and sustainability of the country's research ecosystem across academia and industry (Yelibay et al., 2022). Kazakhstan's innovative capacity remains limited (Kuzhabekova & Mukhamejanova, 2017), and although its research output leads Central Asia, the overall number of internationally recognized publications remains comparatively low (Hernández-Torrano et al., 2021). Reflecting these challenges, the OECD's review of Kazakhstani higher education highlighted a weak pipeline of graduate students and questioned whether the system can supply the "talented replacements" needed to sustain future research productivity (OECD, 2017, p. 37).

In response to these challenges, Kazakhstan established Nazarbayev University (NU) in 2010 as a flagship "world-class" research university intended to integrate international standards of teaching and research and to serve as a national model of excellence (Abylgazina & Mamaytazina, 2015; Hwami, 2023). NU is expected to contribute to the development of a knowledge-based economy by preparing graduates who are not only professionally competent but also capable of conducting research. International scholarship increasingly highlights the role of undergraduate research in preparing students for advanced study and innovation-driven labor markets.

The expansion of undergraduate research opportunities has historically been most visible in established research-intensive systems; however, it has increasingly become part of higher education reform in countries seeking to build their own capacity (Bauer & Bennett, 2003; Shaw et al., 2013; Turner et al., 2008). Concepts such as integrating research and education (IRE) were developed to challenge the traditional separation of teaching and research, instead positioning undergraduate engagement in research as a mainstream feature of high-quality learning environments (Bauer & Bennett, 2003; Jenkins & Healey, 2007). Within this discourse, undergraduate research serves two interconnected purposes: preparation for further graduate study and the development of broader capabilities necessary for innovation-driven societies (Levy & Petrulis, 2012; Turner et al., 2008).

Despite the extensive literature on undergraduate research experiences, most empirical studies are situated in mature higher education systems in North America, Western Europe, and Australia. Comparatively less is known about how research-oriented undergraduate education operates in newly established research universities, particularly in emerging higher education systems (Davis, Evans & Hickey, 2006; Turner et al., 2008). This gap is particularly visible in Central Asia, where research-oriented universities have only recently been established and where evidence on students' research preparation remains scarce (Kuzhabekova & Lee, 2020).

This study addresses this gap by examining final-year undergraduate students' perceptions of their research preparedness at Nazarbayev University. Drawing on prior conceptualizations of research preparedness as a multidimensional construct encompassing learning motivation, research environment, research self-efficacy, and research orientation (Shaw, 2010; Adedokun et al., 2013; Turner et al., 2008), the study investigates: (1) the types of research activities students experienced; (2) their perceived levels of motivation, confidence in research skills, environmental support, and

awareness of research pathways; (3) whether perceptions differed by gender or disciplinary affiliation; and (4) how perceptions correlate with intention to pursue graduate degrees.

As a newly established institution operating within a rapidly reforming higher education landscape that integrates research into undergraduate education, NU offers an important context for examining whether institutional structures, curricula, and research cultures effectively prepare students for independent inquiry and postgraduate study. The use of 2015 data is particularly valuable, as it provides a critical historical baseline for Kazakhstan's higher education landscape. This period marks the graduation of the first cohort of undergraduate students from Nazarbayev University. Studying NU, therefore, contributes not only to understanding the institutional development of Kazakhstan's higher education system but also to comparative debates on how newly created research universities in non-Western contexts translate ambitious policy objectives into student learning experiences.

Literature Review

Purpose of Undergraduate Research

Incorporating research into undergraduate education has traditionally served two primary purposes: preparing students for postgraduate study and developing competencies demanded by modern innovation-driven societies. Historically, the linkage between teaching and research has been central to the evolution of higher education, with research-intensive universities particularly embedding research into undergraduate learning (Neumann, 1994; Robertson, 2007; Wilson et al., 2012). More recently, as nations pursue knowledge-based development strategies, undergraduate research has increasingly been positioned as a mechanism for cultivating analytical, inquiry-driven graduates capable of contributing to national innovation agendas (Bauer & Bennett, 2003; Shaw et al., 2013; Turner et al., 2008; Yauch, 2007).

This shift is reflected in the concept of 'integrating research and education' (IRE), which moves beyond the traditional separation of teaching and research to mainstream inquiry throughout the undergraduate curriculum (Bauer & Bennett, 2003; Jenkins & Healey, 2007). This approach has further evolved into the broader framework of 'Undergraduate Research Experience' (URE). (Broussard et al., 2025). While preparation for research careers is directly relevant to only a subset of students, scholars argue that inquiry-based learning benefits all students by developing cognitive sophistication, problem-solving capacity, and adaptability (Levy & Petrulis, 2012; MacDonald et al., 2024). Turner et al. (2008) identify four principal approaches to integrating research in undergraduate education: learning about others' research, learning to conduct research, learning through research processes, and engagement in pedagogical research. The first three are most commonly implemented and collectively shape the structure of undergraduate research experiences.

Skills Developed and Challenges while doing Undergraduate Research

Scholars consistently highlight a cluster of core competencies that undergraduate research is expected to develop. These include the ability to locate, synthesize, and critically appraise the literature; formulate researchable questions; and construct coherent arguments (Stefani et al., 1997; Yauch, 2007). Methodological competence is equally emphasized, encompassing project

planning, design, organization, data analysis, and interpretation (Stefani et al., 1997; Willison & O'Regan, 2007). Willison and O'Regan (2007) further argue that inquiry-based learning requires the structured development of skills, ranging from guided engagement with small projects to independent, high-quality research.

Undergraduate research is also expected to cultivate transferable competencies such as written and oral communication, digital and information literacy, and time management, which support both academic success and broader employability in complex professional environments (Stefani et al., 1997; Willison et al., 2009). Collectively, these capabilities form a foundation for both lifelong learning and potential entry into research careers.

While undergraduate research offers substantial benefits, studies also highlight notable challenges. Students frequently report difficulties managing the competing demands of coursework and research, limited time, uncertainty in formulating research questions, and challenges in data collection (Levy & Petrulis, 2012; Shaw, 2010). Feelings of isolation are also commonly reported, particularly when research responsibilities require independent work (Shaw, 2010). Similar findings emerge among final-year dissertation students, who value autonomy and authenticity but experience time pressure and stress balancing academic tasks (Todd et al., 2004). Research-focused programs also reveal transitional challenges, including fear of failure and mismatched perceptions between students and faculty regarding support needs (Kiley, Moyes & Clayton, 2009). These findings underscore the importance of both institutional support and learning environments in shaping undergraduate research experiences.

Disciplinary and Gender Differences

Research experience is also shaped by disciplinary cultures. Differences between laboratory-based and social science fields have been documented, reflecting variations in research organization, epistemic culture, and supervisory relationships (Golde & Dore, 2001; Turner et al., 2008). However, evidence is not uniform; Turner et al. (2008) found minimal institutional differences across three universities, suggesting that organizational structures and cultures may reduce disciplinary variation in some contexts.

Gender-related findings are similarly mixed. Some studies report that male students demonstrate greater confidence in certain aspects of research (Kardash, 2000; Shaw, 2010), whereas others find no significant gender differences in perceptions of research or in research outcomes (Bauer & Bennett, 2003). These inconsistencies suggest the need to explore whether such differences emerge in newer institutional and national contexts, such as Kazakhstan.

Intention to pursue graduate studies

Given growing interest in developing national research capacity, scholars increasingly examine how undergraduate research influences students' aspirations toward graduate study. Prior studies identify three broad categories of determinants shaping career and study trajectories: student background characteristics, institutional structures, and individual university experiences, including research engagement (Villarejo et al., 2008). Research experience is frequently associated with stronger intentions to pursue graduate study, driven by curiosity, enjoyment of

problem-solving, independence, and intrinsic interest in discovery (McGee & Keller, as cited in Shaw, 2010). Research self-efficacy, confidence in performing research-related tasks, has also been shown to predict graduate study intentions (Shaw, 2010; Forester et al., 2004).

Theoretical Framework

This study draws on Bandura's Social Cognitive Theory (SCT) to examine undergraduate students' perceptions of their research preparedness. SCT posits that human functioning results from the dynamic interaction between personal factors, behaviors, and environmental conditions, a relationship described as triadic reciprocal causation (Bandura, 1986). Within this framework, students' beliefs about their abilities, their motivation to engage in learning, and the environments in which they study mutually influence one another and shape academic outcomes. SCT has been widely applied in higher education research to explain how confidence, engagement, and context influence persistence, performance, and career intentions, making it particularly appropriate for understanding undergraduate research engagement (Adedokun et al., 2013; Forester, Kahn & Hesson-McInnes, 2004; Turner et al., 2008).

Central to SCT is the concept of self-efficacy, defined as an individual's belief in their ability to perform a task successfully. In the context of undergraduate research, research self-efficacy refers to students' confidence in undertaking key elements of the research process, generating questions, designing studies, analyzing data, and communicating results. Prior studies demonstrate that higher research self-efficacy is associated with greater engagement in research, stronger interest in pursuing research careers, and increased likelihood of continuing to graduate study (Forester et al., 2004; Shaw, 2010; Adedokun et al., 2013). Thus, examining perceived confidence in research tasks provides important insight into whether students feel prepared for independent inquiry and likely to persist in advanced research training.

Learning motivation is another key construct derived from SCT and plays a critical role in research engagement. Motivation influences the extent to which students invest effort, persist through difficulty, and sustain interest in long-term academic activities such as research (Schunk, 2003; Lovitts, 2005). Intrinsic value, interest in learning, and self-regulatory strategies are particularly important, as research often requires autonomous work, resilience, and curiosity-driven inquiry. Students who are motivated to learn and able to regulate their academic behavior are more likely to approach research as an opportunity for intellectual growth rather than as a requirement to be completed, thereby enhancing their skill development.

Environmental and contextual factors form the third pillar of SCT and are especially relevant in institutional settings seeking to build research capacity. The research environment encompasses both tangible supports, such as resources, facilities, supervision, and institutional structures, and socio-cultural dimensions, including belonging, interaction with faculty, and integration into a research community (Lovitts, 2005; Stefani et al., 1997). Students are more likely to view themselves as capable researchers when they feel supported, connected, and embedded in an intellectually stimulating environment. Awareness of research opportunities and career pathways further shapes perceptions, as students who understand what research entails and see viable futures in research are more likely to consider postgraduate study and research careers (Adedokun et al., 2013; Turner et al., 2008).

Guided by Social Cognitive Theory, this study examines how motivation, research self-efficacy, and perceived research environment interact to shape undergraduate students' perceptions of their preparedness for research and their intentions to pursue further academic study. In emerging research systems such as Kazakhstan's, students' perceptions of their preparedness hold significant policy relevance. Motivation, confidence, sense of belonging, and awareness of research opportunities help understand whether reforms could nurture future researchers. This study aimed to address the following research questions:

1. What are the types of research activities that NU undergraduate students experienced?
2. What are the levels of learning motivation, research environment, research self-efficacy, research orientation, and intention to pursue a graduate degree?
3. Are there differences between male and female students' groups and among the three schools in terms of learning motivation, research environment, research self-efficacy, and research orientation?
4. What is the relationship between the NU undergraduate students' research 'preparedness' factors and the intention to pursue a graduate degree?

Methodology

The study employed an online cross-sectional survey design to gather data that enabled the identification of perceptions at a particular point in time. The study was conducted at Nazarbayev University, which was established to provide international-standard higher education and research in Kazakhstan. At the time of the study, it was the first cohort of Bachelor students to graduate from NU. The university attracts highly talented students and is expected to prepare high-quality specialists across various professional fields to serve the needs of the market economy and to train young researchers to contribute to building research capacity in Kazakhstan (Gafu, 2019; Hartley, 2024; Hwami, 2023). Thus, it is expected to include a strong research component in its undergraduate curriculum. Therefore, this university was considered an appropriate site for research.

As students develop an understanding of their research experience only towards the end of their studies, the study focused on the subgroup of final-year undergraduate students as the target population. At the time of the study, Nazarbayev University had four undergraduate schools: the School of Engineering (SEng), the School of Social Science and Humanities (SSSH), the School of Science and Technology (SST), and the School of Medicine (SoM). Because the School of Medicine welcomed its first cohort of students in 2015 and had not yet had senior undergraduates, it was excluded from the sample; thus, the target population comprises final-year undergraduate students from three NU schools.

The questionnaire was adapted from three prior surveys, including the study of honor programs in the Australian context by Shaw (2010), the work on undergraduate research experience by Adedokun et al. (2013), and the research by Turner et al. (2008). The questionnaire consists of four parts, which use two types of questions (multiple choice questions and a 6-point Likert scale). No personal information was requested or reported to protect participants' anonymity.

After identifying the target population and finalizing the study instrumentation, the Institutional Review Board approved the study. The students were sent an invitation email letter with the information about the purpose, procedures, their rights, possible risks, potential benefits, and other necessary information on the study enclosed in informed consent form, including the note saying that by participating in the survey the participants confirm their understanding of their rights, possible risks, and potential benefits and thus express their consent to participate. The email also included a link to the online survey.

All 407 final-year undergraduate students at three Nazarbayev University Schools were contacted; 77 completed the survey (25 from SEng, 18 from SHSS, and 33 from SST). The survey responses were uploaded directly to SPSS from the Qualtrics online survey service, thereby avoiding input errors. Two independent variables were used in the study to group the responses: gender and school. Several dependent variables were computed in the study: Learning motivation, Research environment, Research self-efficacy, Research orientation, Research preparedness Score, and Intention.

Findings

Research experience

The list of research activities students experienced throughout their undergraduate program was developed based on the literature and is presented in Table 1, which indicates the total number of times each activity was selected by respondents in the online questionnaire. The most common activities students engaged in were reading research papers, working in research groups, attending research seminars, and participating in faculty or guest lecturer discussions of research. The less frequent activities that students experienced are being the subject of study and working as a research assistant. According to the study conducted by Turner et al. (2008), the most frequent activity that undergraduate students experienced in three universities in two countries, the UK and Canada, is the “Faculty discuss research” (79%), while the findings of the current study reveal this activity was experienced by only 55% of students at NU.

Table 1

Types of research activities

Activity	Frequenc y	Percent
Reading a research paper	62	80%
Involved in research groups	49	64%
Attending research seminars	49	64%
Guest lecturer discusses research	45	58%
Faculty discuss research	42	55%
Involved in practical activities/fieldwork	38	49%
Development of research techniques	37	48%
Contributing to a research report or other output	33	43%

Being a subject of the research	31	40%
Acting as a research assistant	22	29%

Research preparedness

The Research Preparedness construct consisted of Learning Motivation, Research Environment, Research Self-Efficacy, and Research Orientation subscales or factors. The respondents were asked to respond to a series of statements by indicating the extent of their agreement with each item on a six-point Likert scale, from ‘Not at all Confident’ (1) to ‘Extremely Confident’ (6) for the Research Self-efficacy scale and from ‘Extremely Disagree’ (1) to ‘Extremely Agree’ (6) for all other scales including the question “I intent to pursue Master’s degree”. Table 2 presents the reliability analyses for all research preparedness scales and subscales. Following Cohen et al. (2011), Cronbach’s alpha coefficients above 0.90 indicate very high reliability; 0.80–0.89, high reliability; 0.70–0.79, moderate reliability; 0.60–0.69, minimal reliability; and values below 0.60, low reliability. The results demonstrate that most scales and subscales exhibited excellent, good, or acceptable reliability. The only exception was the Learning Community subscale, which fell below the 0.60 threshold, indicating limited internal consistency.

Table 2

Scales descriptive statistics

Scale	Sub Scale	No. of Items	Cronbach’s Alpha	M (SD)	M (SD)
Learning Motivation	Intrinsic Value	4	0.790	4.40 (.86)	
	Self-Regulation	5	0.765	3.72 (.68)	4.04 (.638)
	Cognitive Strategy Use	4	0.649	3.99 (.70)	
Research Environment	Learning Community	5	0.560	4.08 (.78)	
	Research Support	4	0.606	4.42 (.82)	4.25 (.713)
Research self-efficacy	Conceptualization	5	0.930	4.40 (.75)	
	Early Tasks	6	0.933	4.32 (.81)	4.26 (.740)
	Implementation	6	0.930	4.17 (.84)	
	Presenting the Results	9	0.927	4.25 (.79)	
Research Orientation	Research Awareness	5	0.744	4.02 (.91)	4.02 (.91)
Intention to graduate degree		1		4.75 (1.36)	
Research Preparedness		4			16.57 (2.41)

Score

Overall, students demonstrated a generally high level of composite Research Preparedness Score (RPS) of 16.57 (SD = 2.41; range = 4–21.21) (Table 2). The means of each subscale were summed to compute a weighted total score for each respondent (each subscale could contribute up to 6 points), and then the RPS was calculated possibly falling between 1 and 24 points. This value sits significantly above the scale's midpoint of 12.0. Moreover, students expressed a high intention to continue their studies at the graduate level, actually showing the highest score among all measures (M = 4.75, SD=1.36).

Learning Motivation subscale

Students reported strong learning motivation, with all subscale means falling between 'tend to agree' and 'agree'. The highest levels of agreement were observed for Intrinsic Value (M = 4.40, SD = 0.86), a construct measuring the perceived importance, utility, and interest in the learning process. Specifically, students indicated that understanding their coursework was personally important, that the material was useful to know, and that they preferred challenging work that facilitated new learning. This suggests that the majority of students viewed their academic engagement through a lens of intellectual growth and practical relevance rather than mere requirement.. The lowest mean within this construct was for Self-Regulation (M = 3.72, SD = 0.68), suggesting greater variability and less confidence in sustaining disciplined, independent study behaviors.

A closer look at time management provides important nuance. Of the 77 respondents, 30 reported “strongly disagree” to “tend to disagree,” and another 25 reported only “tend to agree” regarding statements about effective time management (question B22 from the Self-Regulation sub-scale). Thus, a clear majority (55 of 77 students) expressed reservations about their ability to organize time effectively. This highlights time management and self-regulation as the most salient areas of concern.

Research Environment subscale

Students perceived their Research Environment positively. Responses in the Research Support subscale were particularly strong (M = 4.42, SD = 0.82), indicating satisfaction with access to facilities, resources, services, and support networks. Perceptions of belonging to a Learning Community were comparatively weaker, though still positive (M = 4.08, SD = 0.78). However, these specific results should be interpreted with caution due to the subscale's lower internal consistency ($\alpha = 0.560$), which may limit the precision of this finding. Notably, 31 respondents (40 percent) reported feeling isolated while studying, suggesting that a substantial proportion of students did not fully experience integration into a broader academic research community.

Research Self-Efficacy subscale

Perceived Research Self-Efficacy was also high across all stages of the research process. Students expressed slightly greater confidence in Conceptualization (M = 4.40, SD = 0.75) and Early Tasks (M = 4.32, SD = 0.81), such as identifying research topics and formulating questions. Confidence remained relatively strong during Implementation (M = 4.17, SD = 0.84) and in Presenting Results (M = 4.25, SD = 0.79), although scores were marginally lower, suggesting that some aspects of conducting and communicating research may be more demanding.

Research Orientation subscale

Students' Research Orientation scores were positive ($M = 4.02$, $SD = 0.91$), indicating awareness of research processes and expectations for graduate study. However, respondents were comparatively less informed about specific research career pathways and specialization opportunities. Despite these uncertainties, students' academic aspirations were high: intentions to pursue graduate study were strong overall ($M = 4.75$, $SD = 1.36$).

Subgroup differences

To assess potential differences between females and males, and between groups of students from different schools, the study employed an independent-samples t-test and ANOVA. Overall, as shown in Table 3, none of the p-values are significant at the 0.05 level, suggesting that there are no significant differences in the four factor variables between male and female students.

Table 3

T-test results on gender differences

	Female (N=50) M (SD)	Male (N=27) M (SD)	T-Test
Learning Motivation	4.02 (.69)	4.06 (.52)	$t = .25, p = .805$
Research Environment	4.34 (.74)	4.08 (.65)	$t = -1.51, p = .136$
Research Self-efficacy	4.21 (.78)	4.43 (.65)	$t = 1.25, p = .216$
Research Orientation	3.99 (.97)	4.13 (.80)	$t = .72, p = .471$

According to Table 4, which presents the results of ANOVA, none of the p-values from the F-tests are below 0.05, there are no significant differences in the four factor variables among students from the three schools.

Table 4

ANOVA results on school-related differences

	SEng (N=25) M (SD)	SHSS (N=19) M (SD)	SST (N=33) M (SD)	F-Test
Learning Motivation	3.85 (.71)	4.04 (.56)	4.17 (.60)	$F = 1.82, p = .169$
Research Environment	4.13 (.89)	4.20 (.62)	4.36 (.59)	$F = .78, p = .460$
Research Self-efficacy	4.14 (.81)	4.32 (.72)	4.38 (.70)	$F = .78, p = .463$
Research Orientation	3.99 (.97)	3.97 (.81)	4.13 (.80)	$F = 2.21, p = .116$

Relationship with Intention

A bivariate regression analysis was conducted to determine the Pearson correlation coefficient using SPSS software (see Table 8).

Table 8

Correlation between RPS, four-factor variables, and Intention

	RPS	Learning Motivation	Research Environment	Research Self- efficacy	Research Orientation
Intention	.530**	.300**	.335**	.106	.865**
	r= .000	r= .008	r= .003	r= .357	r= .000

** . Correlation is significant at the 0.01 level (2-tailed).

All Pearson coefficients show a positive relationship between the variables. The strongest correlation was revealed between the Research orientation factor-variable and the Intention variable, with its coefficient (.865) lying above 0.86, which means a very strong association of variables. The correlation coefficient (.300) shows only a slight positive relationship between the Learning Motivation factor variable and the Intention variable. The two coefficients between .35 and .65 can be considered indicative of a moderate relationship between the variables. Very surprisingly, the lowest and insignificant coefficient was between the Research Self-efficacy factor and the Intention.

Overall, the moderate relationship between the RPS and the Intention variables allowed concluding that the higher the level of perceptions of Research Preparedness the higher the likelihood of choosing to pursue a further graduate degree. This conclusion supported the study's initial hypothesis, which was stated at the beginning.

The findings indicated that the undergraduate programs across all three schools included a substantial number of research activities, preparing students for research at a relatively high level. The data analysis revealed that students perceived their Learning motivation, Research environment, Research self-efficacy, and Research orientation positively, with the majority choosing to pursue a graduate degree. Using t-tests and ANOVA, the study also found no gender or school-related differences among undergraduate students across all research preparedness factors. Some interesting findings are discussed in the next section with reference to the existing international literature.

Discussion

Although modest in scope, the findings offer important insight into whether the ambitions of establishing NU as a flagship research university translated into meaningful student experience during its early institutional stage. The results suggest that NU undergraduate programs incorporated a substantive range of research-related activities and that students generally perceived

themselves as motivated, competent, and positively supported in their development as emerging researchers. In this respect, the study aligns with international evidence indicating that structured opportunities to engage with inquiry, supervision, and independent research can effectively foster students' self-efficacy and skill development (Adedokun et al., 2013; Turner et al., 2008). For a newly established institution embedded in a national agenda to build research capacity, such perceptions are significant; they suggest that NU's effort to integrate research into the undergraduate curriculum was not merely symbolic, but had an observable impact on students' preparedness.

However, the findings also indicate areas where the system may not yet have fully matured. Students reported a weaker sense of belonging to a research community compared with their confidence in available resources and technical support. While the lower reliability of the Learning Community scale necessitates a cautious interpretation, the finding that 40% of students experienced isolation aligns with international studies highlighting that research preparedness is not solely a matter of skill acquisition but also of social and academic integration (Lovitts, 2005). Given Kazakhstan's emphasis on cultivating future researchers, the relational and community dimensions of research training deserve attention alongside curricular and infrastructural development.

Not surprisingly, the self-regulation score results show that the time management item has the lowest mean. This is consistent not only with international literature (Todd et al., 2004) but also with the results of another study conducted at Nazarbayev University (Akhmetova et al., 2014), in which students reported the same problem. These competencies are central to independent inquiry and often represent transitional difficulties rather than deficits in ability. The recurrence of this pattern across contexts suggests that self-regulatory skill development should be intentionally scaffolded within undergraduate curricula, particularly in research-intensive settings.

Interestingly, the study did not identify meaningful differences in perceived research preparedness by gender or academic school. In the context of international debates that frequently report disparities in confidence, access, or outcomes, this finding is particularly noteworthy. It may indicate that NU's relatively standardized institutional model, shared research expectations, and selective student intake helped shape consistently positive experiences across disciplines. At the same time, the finding raises productive questions for future research regarding whether equity of perception translates into equity of participation, performance, and long-term research engagement.

One of the most intriguing findings concerns the weak and statistically insignificant correlation between research self-efficacy and intention to pursue graduate study. Prior research frequently identifies self-efficacy as a predictor of academic persistence (Forester et al., 2004; Shaw, 2010). In contrast, this study found that research orientation, awareness of graduate study, and research career pathways were the strongest correlates of intention. This suggests that informational clarity and perceived career trajectories may play a more decisive role in shaping aspirations than confidence in technical research skills alone. In emerging research systems, where career structures and research labor markets may still be evolving, awareness of pathways may be especially influential in shaping student decisions.

Drawing on Albert Bandura's Social Cognitive Theory, research preparedness can be understood as the interaction of personal factors (motivation and self-efficacy), environmental conditions (research support and learning community), and behavioral intentions (pursuit of graduate study). The data suggest that NU's institutional environment provided strong structural support (resources, facilities, faculty engagement), which likely contributed to students' high levels of perceived research self-efficacy and strong intentions to pursue graduate education.

However, SCT also emphasizes the importance of social integration within learning environments. The comparatively weaker Learning Community scores and reports of isolation indicate that while technical and infrastructural conditions were favorable, the social-embedded dimension of research training was less fully consolidated. This distinction is theoretically important: confidence in performing research tasks does not automatically translate into a durable research identity if students do not experience a sense of belonging within a scholarly community.

Taken together, the findings reinforce several broader arguments. First, research preparedness is multidimensional: it encompasses motivation, confidence, institutional support, and awareness of research pathways rather than technical competence alone. Second, well-resourced environments can successfully cultivate positive perceptions of preparedness even in emerging higher education systems. Third, the development of a strong research culture requires continued attention not only to curriculum, facilities, and faculty engagement, but also to the social dynamics and community structures that enable students to feel embedded in research practice.

Conclusion

This study contributes to understanding the role of a newly established research university in an emerging higher education system by exploring how NU undergraduate students perceived their preparedness for research. Despite its limitations, a small sample, single institutional focus, self-reported measures, and cross-sectional design, the study offers meaningful conceptual, institutional, and policy-relevant insights.

Empirically, the study shows that early NU undergraduates generally believed they had acquired research skills, were motivated to learn, and were supported by a favorable institutional environment. Many also expressed intentions to pursue graduate study, suggesting that NU's early emphasis on integrating research into undergraduate education may have contributed to national aspirations to build a stronger research workforce. At the same time, the findings identified persistent challenges, particularly in time management, self-regulation, and a limited sense of belonging within the research community, areas that require ongoing institutional attention. Given that this study reflects an early institutional phase, NU may consider periodically reassessing undergraduate research preparedness through updated empirical research. Longitudinal or cohort-based tracking would allow the university to evaluate change over time, assess the effectiveness of reforms, and sustain evidence-informed enhancement of research education.

Conceptually, the study reinforces the value of understanding research preparedness as a multidimensional construct that includes psychological, pedagogical, and environmental dimensions, rather than as a narrow set of technical competencies. This framing is particularly relevant for countries, such as Kazakhstan, that seek to leverage higher education as a mechanism for innovation, human capital development, and international competitiveness. Historically, this

study has enduring significance. It documents a unique moment in Nazarbayev University's development. It provides early evidence that future researchers, institutional leaders, and policymakers can reference when evaluating NU's evolution and broader national reforms.

Policy-wise, the findings suggest that NU offers a promising model for fostering undergraduate research preparedness, which may inform other Kazakhstani universities seeking to strengthen their research capacity. However, scholars have already cautioned about tensions between NU and local regional universities in potential practice diffusion (Gafu, 2019; Kuzhabekova & Lee, 2018). Thus, the process should not be merely a replication but a thoughtful exchange, recognizing that institutional missions, resources, contexts, and cultures vary widely. Ultimately, this study should be viewed not as an evaluative or assessment but as an exploratory, agenda-setting contribution. It raises important questions for further research, highlights areas of success and vulnerability, and underscores the need for sustained inquiry into how research universities in emerging contexts prepare students to participate in global knowledge production.

Limitations and Recommendations for Further Research

This study has several limitations that should be acknowledged when interpreting the findings. First, the study relied exclusively on the survey method. While surveys are useful for capturing perceptions at a particular moment, they are inherently limited in their ability to explore processes, meanings, and contextual nuances in depth, as questionnaires are standardized, constrained in scope, and restricted in the richness of responses they permit (Muijs, 2011). Although the instrument was comprehensive, its length, comprising 65 items, likely contributed to respondent fatigue and may have discouraged broader participation, thereby affecting the response rate.

Second, the study is based on a relatively small sample of final-year students from a single institution. Although the sample represents an important cohort, its size limits statistical power and restricts the extent to which findings can be generalized beyond Nazarbayev University. Moreover, as participation was voluntary, there is a possibility of self-selection bias, whereby students with more positive or more engaged research experiences may have been more likely to participate. Third, all measures relied on student self-reports, which may not fully reflect actual skill levels, preparedness, or behavioral engagement in research. Self-reported perceptions can be influenced by confidence, expectations, social desirability, and institutional loyalty. They should therefore be interpreted as perceptions of preparedness rather than objective indicators of capability.

Fourth, this study reflects a specific historical moment: the early years of NU's development. While this offers valuable insight into an important formative stage, the data do not capture how perceptions of research preparedness may have evolved as institutional structures, curricula, and research culture matured. In a rapidly evolving higher education system, recent studies are vital for assessing whether initial strengths have been sustained and whether early weaknesses, such as a limited sense of belonging or challenges with self-regulation, have been addressed.

Despite these limitations, the study provides a rare and useful contribution by documenting early undergraduate research experiences in Kazakhstan's flagship research university. However, future research could significantly strengthen and extend this evidence base. Mixed-methods or qualitative studies incorporating interviews, focus groups, or longitudinal tracking would help

deepen understanding of how students experience research, how preparedness develops over time, and how institutional environments shape research identities. Comparative studies involving other Kazakhstani universities or institutions in similar emerging higher education systems would also be valuable in identifying commonalities, contextual differences, and potential system-level gaps.

Future research might also include additional variables, such as academic performance indicators (e.g., GPA), prior educational background, sociodemographic characteristics, and participation in structured research programs or internships, to better understand how individual and institutional factors interact to shape preparedness. Methodologically, more advanced analytical approaches, such as structural equation modeling, multilevel analysis, or longitudinal panel designs, could provide stronger evidence regarding causal relationships among institutional environments, individual experiences, and research outcomes. Finally, as Kazakhstan continues to reform its higher education and research sectors, updated empirical studies are needed to evaluate progress, identify persistent challenges, and inform policy and institutional strategies for strengthening undergraduate research capacity.

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APPENDIX A

Survey questionnaire

The study explores NU final-year undergraduate students' research experience gained throughout the education process at Nazarbayev University and research preparedness regarding learning motivation, research self-efficacy, research environment, and research orientation, and its relationship to the decision to pursue the Master's degree.

Please complete this questionnaire as accurately as possible, and many thanks for your time and interest!

PART A

GENERAL INFORMATION Please tick the appropriate box

- A1** What is your gender?
- ☐ Male
- ☐ Female
- A2** What is your school?
- ☐ School of Engineering
- ☐ School of Humanities and Social Sciences
- ☐ School of Science and Technology
- A4** Is your program incorporating a thesis?
- ☐ Yes
- ☐ No
- A5** Is your program incorporating a research project?
- ☐ Yes
- ☐ No
- A7** Please select the item you have experienced in your University:
- ☐ Faculty discuss research
- ☐ Guest lecturer discusses research
- ☐ Reading research paper
- ☐ Development of research techniques
- ☐ Attending research seminars
- ☐ Involved in practical activities/fieldwork
- ☐ Involved in research groups
- ☐ Contributing to research report or other output
- ☐ Acting as research assistant
- A8** Does the university faculty or school provide facilities and resources to enable you to carry out your research?

PART B							
Below you will find a series of statements relating to your behavior in your program. Please indicate on a 1 to 6-point scale whether you agree or disagree with the statement by ticking the box.		S t r o n g l y d i s a g r e e	Dis agr ee	T e n d t o d i s a g r e e	Ten d to agr ee	Agr ee	S t r o n g l y A g r e e
B1	Understanding of each course of the program is important to me						
B2	When work is hard, I give up or study only the easy parts of courses.						
B3	It is hard for me to decide what the main ideas are in what I read						
B4	I have access to adequate library resources.						
B5	I think what I am learning in this program is useful for me to know						
B6	Before I begin studying each individual course, I think about the things I will need to do to learn.						
B7	When I study, I put important ideas into my own words.						
B8	I feel I belong to the university community						
B9	I belong to student associations on campus.						
B10	I am able to explore academic interests with students and staff						
B11	I like what I am learning in the program.						
B12	I am able to use electronic journals, databases and search engines effectively						

B13	Even when studying is uninteresting, I keep working until I finish.						
B14	I experience feelings of isolation when carrying out study						
B15	I have access to study areas within the School						
B16	When I am studying a topic, I try to make everything fits together						
B17	I have a close network of fellow students.						
B18	I prefer work that is challenging so I can learn new things						
B19	When I am reading, I stop once in a while and go over what I have read						
B20	When reading, I try to connect the things I am reading about what I already know						
B21	I can talk to lecturers about problems I am experiencing						
B22	I have effective time management skills.						

PART C							
Below you will find a series of statements relating to how confident you feel about completing each task. Please indicate your level of confidence with each statement by ticking the appropriate column How confident are you in your ability to:		N o t a t a l l c o n f i d e n t	N o t C o n f i d e n t	N o t v e r y c o n f i d e n t	A l i t t l e c o n f i d e n t	con fide nt	E xt re m e l y c o n f i d e n t
C1	Complete a project independently.						
C2	Develop a logical rationale for your particular research idea						
C3	Brainstorm areas in the literature to read about						
C4	Identify areas of needed research based on reading the literature.						
C5	Consult research ideas with senior researchers						
C6	Be flexible in developing alternate research strategies.						
C7	Formulate researchable questions						
C8	Interpret and understand statistical printouts.						
C9	Identify implications for future research.						
C10	Utilize criticism from reviews of your idea.						
C11	Decide when to quit generating ideas based on your literature review.						
C12	Plan the research project.						
C13	Obtain approval to pursue your research.						
C14	Organize your proposed research ideas in writing						
C15	Choose an appropriate research design.						

C16	Writing a literature review						
C17	Organize data collection for analysis.						
C18	Choose appropriate data analysis techniques.						
C19	Statistically analyzing data using computer software.						
C20	Synthesize results about current literature.						
C21	Identify and report the limitations of the study						
C22	Relating results to the bigger picture in the field						
C23	Understanding research paper/journal article						
C24	Follow ethical principles of research.						
C25	Orally communicate the results of research projects.						
C26	Writing a research paper for publication						
C27	Preparing a research poster						
C28	Working collaboratively with others						

PART D							
	Below you will find a series of statements relating to your orientation. By ticking the appropriate column, please indicate how you feel about the following groups.	S t r o n g l y d i s a g r e e	Dis agr ee	T e n d t o d i s a g r e e	T e n d t o a g r e e	Agr ee	S t r o n g l y A g r e e
D1	I am aware of what graduate school may be like						
D2	I am aware of the expertise of the faculty you worked with						
D3	I am aware of various research-oriented career opportunities available to me.						
D4	I am aware of various research career options I could specialize in						
D5	I understand the nature of the job of a researcher						
D6	I intend to pursue a Master's degree.						

APPENDIX B
Scales composition

Learning Motivation scale	
Sub Scale	Items (statements in the questionnaire)
Intrinsic motivation	B1: Understanding each course of the program is important to me
	B5: I think what I am learning in this program is helpful for me to know
	B11: I like what I am learning in the program
	B18: I prefer work that is challenging so I can learn new things
Self-Regulation	B2: When work is demanding, I give up or study only the easy parts of courses
	B6: Before I begin studying each individual course, I think about the things I will need to do to learn
	B13: Even when studying is uninteresting, I keep working until I finish
	B19: When I am reading, I stop once in a while and go over what I have read
	B22: I have effective time management skills
Cognitive strategy use	B3: It is hard for me to decide what the main ideas are in what I read
	B7: When I study, I put important ideas into my own words
	B16: When I am studying a topic, I try to make everything fit together
	B20: When reading, I try to connect the things I am reading about with what I already know
Research Environment Scale	
Sub Scale	Item (statement in the questionnaire)
Learning Community	B8: I feel I belong to the university community
	B10: I am able to explore academic interests with students and staff
	B14: I experience feelings of isolation when carrying out a study
	B17: I have a close network of fellow students
	B21: I can talk to lecturers about problems I am experiencing
Research support	B4: I have access to adequate library resources
	B9: I belong to student associations on campus
	B12: I am able to use electronic journals, databases, and search engines effectively
	B15: I have access to study areas within the School
Research Self-efficacy	

Sub Scale	Item (statement in the questionnaire)
Conceptualization	C3: Brainstorm areas in the literature to read about
	C4: Identify areas of needed research based on reading the literature
	C5: Consult research ideas with senior researchers
	C11: Decide when to quit generating ideas based on your literature review
	C23: Understanding research paper/journal article
Early tasks	C6: Be flexible in developing alternate research strategies
	C13: Obtain approval to pursue your research
	C14: Organize your proposed research ideas in writing.
	C16: Writing a literature review
	C17: Organize data collection for analysis
Implementation	C18: Choose appropriate data analysis techniques
	C2: Develop a logical rationale for your particular research idea.
	C7: Formulate researchable questions
	C10: Utilize criticism from reviews of your idea
	C12: Plan the research project.
Presenting results	C15: Choose an appropriate research design.
	C24: Follow ethical principles of research
	C8: Interpret and understand statistical printouts
	C9: Identify implications for future research
	C19: Statistically analyzing data using computer software.
	C20: Synthesize results with regard to current literature
	C21: Identify and report limitations of the study
	C22: Relating results to the bigger picture in the field
	C25: Orally communicate the results of research projects.
Research orientation Scale	C26: Writing a research paper for publication
	C27: Preparing a research poster
Research orientation Scale	
Sub Scale	Item (statement in the questionnaire)
Research Awareness	D1: I am aware of what graduate school may be like
	D2: I am aware of the expertise of the faculty you worked with
	D3: I am aware of various research-oriented career opportunities available to me
	D4: I am aware of various research career options I could specialize in
	D5: I understand the nature of the job of a researcher