

ISSN 2518-1467 (Online),
ISSN 1991-3494 (Print)



CENTRAL ASIAN ACADEMIC
RESEARCH CENTER



SCIENTIFIC JOURNAL OF PEDAGOGY AND ECONOMICS

PUBLISHED SINCE 1944

4 (416)

JULY – AUGUST 2025

ALMATY, 2025

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Scientific Journal of Pedagogy and Economics

ISSN 2518-1467 (Online),

ISSN 1991-3494 (Print).

Owner: «Central Asian Academic Research Center» LLP (Almaty).

The certificate of registration of a periodical printed publication in the Committee of information of the Ministry of Information and Communications of the Republic of Kazakhstan No. 3620-Ж, issued on 05.06.2025

Thematic focus: *«publication of the results of new achievements in the field of fundamental sciences»*

Periodicity: 6 times a year.

<http://www.bulletin-science.kz/index.php/en/>

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Scientific Journal of Pedagogy and Economics

ISSN 2518-1467 (Online),

ISSN 1991-3494 (Print).

Меншіктенуші: «Орталық Азия академиялық ғылыми орталығы» ЖШС (Алматы қ.).

Қазақстан Республикасының Ақпарат және коммуникациялар министрлігінің Ақпарат комитетінде 05.06.2025 ж. берілген № 3620-Ж мерзімдік басылым тіркеуіне қойылу туралы куәлік.

Тақырыптық бағыты: *«іргелі ғылым салалары бойынша жаңа жетістіктердің нәтижелерін жариялау»*

Мерзімділігі: жылына 6 рет.

<http://www.bulletin-science.kz/index.php/en/>

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Scientific Journal of Pedagogy and Economics

ISSN 2518-1467 (Online),

ISSN 1991-3494 (Print).

Собственник: ТОО «Центрально-азиатский академический научный центр» (г. Алматы).

Свидетельство о постановке на учет периодического печатного издания в Комитете информации Министерства информации и коммуникаций и Республики Казахстан № 3620-Ж, выданное 05.06.2025 г.

Тематическая направленность: «публикация результатов новых достижений в области фундаментальных наук».

Периодичность: 6 раз в год.

<http://www.bulletin-science.kz/index.php/en/>

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EVALUATING ESG IMPLEMENTATION IN KAZAKHSTAN'S LEADING UNIVERSITIES

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Abstract: This study investigates the implementation of Environmental, Social and Governance (ESG) principles in Kazakhstan's higher education sector, focusing on four leading institutions: L.N. Gumilyov Eurasian National University, Al-Farabi Kazakh National University, Satbayev University, and Nazarbayev University. The relevance of the research lies on the growing global emphasis on ESG as a driver of institutional sustainability and competitiveness, which remains underexplored in Kazakhstan higher education context. The purpose of the paper is to evaluate the extent of ESG integration and develop a data-driven framework for assessing institutional ESG maturity. The methodology combines quantitative analysis of national statistical databases, institutional reports, and benchmarking against global sustainability frameworks. Two quantitative diagnostic tools are proposed: the Digitalization Index (Ig), measuring the level of digital infrastructure, and the Gender Pay Equality Index (Iw), assessing equity in academic remuneration. The study hypothesizes that higher ESG maturity correlates with greater institutional autonomy, improved academic outcomes, and enhanced global positioning. The findings confirm significant variations among the institutions, with the highest performance in digitalization and mixed results in gender pay equality. The proposed framework can be applied by policymakers, university administrators, and stakeholders to monitor ESG progress, set strategic priorities, and align national higher education policies with the United Nations Sustainable Development Goals.

Keywords: ESG, sustainable development, innovation, strategy, universities, higher education, management

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ҚАЗАҚСТАННЫҢ ЖЕТЕКШІ УНИВЕРСИТЕТТЕРІНЕ ESG ҚАҒИДАТТАРЫН ЕНГІЗУДІ БАҒАЛАУ

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Аннотация: Бұл зерттеу Қазақстанның жоғары білім беру секторында ESG – экологиялық, әлеуметтік және корпоративтік басқару қағидаттарын енгізу тәжірибесін талдауға арналған. Зерттеу төрт жетекші жоғары оқу орнының мысалында жүргізілді: Л.Н. Гумилев атындағы Еуразия ұлттық университеті, Өл-Фараби атындағы Қазақ ұлттық университеті, Satbayev University және Назарбаев Университеті. Зерттеудің өзектілігі ESG-нің институционалдық тұрақтылық пен бәсекеге қабілеттіліктің маңызды факторы ретіндегі жаһандық маңыздылығының артуымен байланысты, алайда бұл тақырып Қазақстанның жоғары білім беру контекстінде әлі де жеткілікті зерттелмеген. Мақаланың мақсаты – ESG қағидаттарының интеграция деңгейін бағалау және білім беру ұйымдарындағы ESG дамуын өлшеуге арналған деректерге негізделген әдістемені әзірлеу. Әдістеме ұлттық статистикалық деректер базаларының, институционалдық есептердің сандық талдауын және жаһандық тұрақты даму жүйелерімен салыстырмалы талдауды қамтиды. Екі сандық диагностикалық құрал ұсынылады: цифрландыру индексі (I_g) – цифрлық инфрақұрылым деңгейін өлшейді және еңбекақы төлеуде гендерлік теңдік индексі (I_w) – академиялық еңбекақының теңдігін бағалайды. Зерттеу гипотезасы бойынша, ESG-нің жоғары деңгейі институционалдық автономияның артуымен, академиялық нәтижелердің жақсаруымен және жаһандық деңгейде позициялаудың күшеюімен өзара байланысты. Зерттеу нәтижелері университеттер арасында айтарлықтай айырмашылықтардың бар екенін көрсетті: ең жоғары көрсеткіштер цифрландыру саласында байқалды, ал гендерлік теңдік бойынша нәтижелер әркелкі болды. Ұсынылған жүйені саясаткерлер, университет әкімшілігі және мүдделі тараптар ESG саласындағы прогресті бақылау, стратегиялық басымдықтарды айқындау және жоғары

білім берудегі ұлттық саясатты Біріккен Ұлттар Ұйымының Тұрақты даму мақсаттарына сәйкестендіру үшін қолдана алады.

Түйін сөздер: ESG, тұрақты даму, инновациялар, стратегия, университеттер, жоғары білім, менеджмент

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ОЦЕНКА ВНЕДРЕНИЯ ПРИНЦИПОВ ESG В ВЕДУЩИХ УНИВЕРСИТЕТАХ КАЗАХСТАНА

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Аннотация. Настоящее исследование посвящено анализу внедрения принципов ESG экологического, социального и корпоративного управления в секторе высшего образования Казахстана на примере четырёх ведущих университетов: Евразийский национальный университет им. Л.Н. Гумилёва, Казахский национальный университет им. аль-Фараби, Satbayev University и Назарбаев Университет. Актуальность исследования обусловлена растущим глобальным вниманием к ESG как к фактору институциональной устойчивости и конкурентоспособности, который остается недостаточно изученным в контексте высшего образования Казахстана. Цель статьи — оценить уровень интеграции принципов ESG и разработать основанную на данных методологию для измерения степени развития ESG в образовательных учреждениях. Методология сочетает количественный анализ национальных статистических баз данных, институциональных отчетов и сравнительный анализ с глобальными системами устойчивого развития. Предлагаются два количественных диагностических инструмента: индекс цифровизации (Ig), измеряющий уровень цифровой инфраструктуры, и индекс гендерного равенства в оплате труда (Iw), оценивающий равенство в академическом вознаграждении. В исследовании выдвигается гипотеза о том, что более высокая степень зрелости ESG коррелирует с большей институциональной автономией, улучшенными академическими результатами и улучшенным позиционированием на глобальном уровне. Результаты исследования подтверждают наличие существенных различий между университетами, наивысшие показатели

достигнуты в сфере цифровизации, в то время как результаты по обеспечению гендерного равенства в оплате труда оказались неоднородными. Предлагаемая система может применяться политиками, администраторами университетов и заинтересованными сторонами для мониторинга прогресса в области ESG, определения стратегических приоритетов и приведения национальной политики в области высшего образования в соответствие с Целями устойчивого развития Организации Объединенных Наций.

Ключевые слова: ESG, устойчивое развитие, инновации, стратегия, университеты, высшее образование, менеджмент

Introduction. Higher education has become a focal point in the global discourse on sustainable development and responsible governance. It is an important tool in preparing specialists equipped with the knowledge and competencies necessary to address the multifaceted challenges of sustainable development. And it fosters the development of critical thinking, adaptability to dynamic socio-environmental conditions, and the capacity for long-term sustainable resource management (Figueiro et al., 2022; Abo-Khalil, 2024). Moreover, higher education institutions play a pivotal role not only in raising awareness of environmental and social issues but also in catalyzing innovation and fostering the intellectual engagement required to design and implement sustainable solutions (Serafini et al., 2022).

Modern universities and educational institutions are expected to align with the principles of sustainable development by embedding the ESG (Environmental, Social and Governance) framework into both their strategic planning and operational practices (Dyllick & Muff, 2016). And the universities are increasingly expected not only to deliver academic knowledge but also to equip students with the competencies required to address environmental, social, and institutional challenges (Leal Filho et al., 2019). In particular, the integration of Environmental, Social, and Governance (ESG) principles has emerged as a strategic imperative for higher education institutions (HEIs) striving to enhance their societal impact, institutional transparency, and long-term resilience. The application of ESG principles in higher education enhances the competitiveness of universities, strengthens their institutional reputation, and facilitates the attraction of additional resources, including international investments.

It should be also considered ESG integration aligns closely with the United Nations Sustainable Development Goals (SDGs) and promotes cross-sectoral transformation through research, education, and outreach (United Nations, 2015). While ESG adoption has advanced in many high-income countries, its implementation in transitional and emerging education systems remains underexplored. In Kazakhstan, universities are beginning to align with international sustainability agendas, yet their efforts are often fragmented and lack unified evaluation mechanisms. And the absence of a localized, standardized framework limits the ability of Kazakhstani HEIs to measure ESG performance, benchmark progress, and inform policy development.

At the same time, Kazakhstan's higher education sector is undergoing a modernization phase characterized by digital transformation, internationalization,

and a growing emphasis on institutional autonomy. These dynamics provide fertile ground for integrating ESG values into university governance and operations. However, current literature and policy guidance offer limited insight into how ESG dimensions—such as gender equity, digitalization, and ethical management—can be effectively operationalized within the national context (OECD, 2019).

Theoretical and empirical research suggests that ESG implementation in higher education positively influences institutional innovation, competitiveness, and social legitimacy. Studies by Dyllick & Muff (2016) emphasize the importance of embedding sustainability across educational, administrative, and governance dimensions and it also was proposed a comprehensive integrative framework that combines environmental, social, and economic components to assess corporate sustainability performance. While their work originally targeted private sector organizations, the framework's emphasis on aligning operational practices with broader sustainability objectives is highly relevant to universities seeking to implement ESG strategies. The structured approach helps institutions not only benchmark progress but also identify systemic areas for improvement within governance, social equity, and digital infrastructure planning.

Carayannis and Campbell (2009) in “Mode 3” and “Quadruple Helix” presented models, which integrate academia, industry, government, and civil society into a co-evolutionary innovation system that reinforces institutional sustainability missions.

Thus, ESG-aligned institutions are more likely to attract funding, build international partnerships, and respond to societal needs. Yet despite these benefits, practical tools for assessing ESG maturity remain scarce in many national systems, including Kazakhstan’s (Stubbs & Cocklin, 2008).

This study responds to that gap by proposing a replicable, evidence-based model for ESG assessment adapted to the realities of Kazakhstani higher education. The research draws on national statistical databases, institutional reports, and open-access university data to construct and apply two diagnostic tools: the Digitalization Index (Ig) and the Gender Pay Equality Index (Iw). These indices are designed to quantify the levels of digital infrastructure and gender equity in academic employment—two ESG dimensions particularly relevant for Kazakhstani universities (Winstanley & Woodall, 2000).

The empirical focus of the study is on four institutions that play a leading role in Kazakhstan’s academic ecosystem: L.N. Gumilyov Eurasian National University, Al-Farabi Kazakh National University, Satbayev University, and Nazarbayev University. These universities were selected due to their national prominence, institutional diversity, and availability of relevant data (World Bank, 2023).

Through the construction and application of the Ig and Iw indices, the research provides a comparative overview of ESG maturity across institutions and identifies inter-university variation in digital transformation and gender parity. These insights inform not only institutional strategy but also broader policymaking aimed at improving transparency, social equity, and sustainable innovation in higher education.

The study aims to answer the following research questions:

- What institutional factors influence the implementation of ESG principles in Kazakhstani higher education?
- How can ESG integration be assessed using quantifiable, localized indicators?

By addressing these questions, the study contributes to the development of a context-sensitive ESG assessment framework and offers a foundation for expanding empirical research and dialogue on sustainability in higher education.

Literature review

The integration of Environmental, Social, and Governance (ESG) principles into higher education is gaining recognition as an essential strategy for promoting sustainability, institutional accountability, and long-term resilience. ESG in higher education extends beyond environmental responsibility to encompass inclusive governance models and socially equitable practices that are vital to the educational mission in the 21st century. The concept builds upon the broader sustainability paradigm while incorporating frameworks that reflect contemporary concerns about digital transformation, social justice, and ethical leadership.

Theoretically, the ESG framework in academia is informed by multiple strands of research. Dyllick & Muff (2016) introduced a sustainability-oriented approach for organizations that has been widely adapted in higher education contexts. Their model encourages institutions to transition from reactive compliance to proactive value creation aligned with societal goals. Similarly, Tilbury (2011) emphasizes the role of transformative learning in fostering sustainability through higher education, suggesting that institutional change must engage all stakeholders—from students and faculty to leadership and administrative staff.

The environmental dimension of ESG refers to a university's capacity to reduce its ecological footprint, implement energy-efficient technologies, and promote environmental literacy across disciplines. According to Lozano, Ceulemans, and Seatter (2015), digitalization—such as the shift to online learning platforms and electronic administration—also plays a crucial role in environmental stewardship by minimizing resource use and promoting efficient knowledge dissemination.

The social component addresses diversity, inclusion, and well-being within academic communities. Gender equity, in particular, is a core aspect of social sustainability in HEIs. Research by Moon (2007) and Hörisch et al. (2014) highlights the strong correlation between gender-balanced faculty representation and improved organizational governance. Equity in compensation and access to leadership positions are not only ethical imperatives but also drivers of performance and institutional credibility.

Governance, the third pillar of ESG, relates to transparency, accountability, participatory decision-making, and ethical leadership. The governance mechanisms in universities must evolve toward participatory and democratic models that incorporate stakeholder input and reflect shared values. Good governance strengthens public trust and supports institutional agility, particularly in rapidly changing policy or funding environments (Vasilescu, Barnab, Epure, & Baicu, 2020).

In recent years, ESG integration has also been shaped by global best practices.

Leading universities such as Harvard Business School (online database Sustainable Business Strategy Development, 2024), Columbia University (Columbia University, 2023) and UCLA (Sustainability at UCLA, 2023) have implemented institution-wide ESG strategies through specialized programs, interdisciplinary research, and operational reforms. These examples provide valuable inspiration but are rooted in contexts that differ significantly from Kazakhstan's, particularly in terms of funding models, administrative autonomy, and infrastructure.

Thus, the transfer of international ESG models to Kazakhstani HEIs requires contextual adaptation. Kazakhstan's higher education system is characterized by a mix of public and semi-autonomous institutions undergoing reforms in governance, financing, and quality assurance. While policy alignment with the SDGs is emerging, operational mechanisms for ESG integration remain underdeveloped. Most research in this area is either descriptive or normative, lacking quantitative tools that can facilitate practical implementation. Sonetti et al. (2019) underscore the need to move beyond rhetorical commitments to sustainability by embedding actionable frameworks across curricula, governance, and campus operations, particularly in transitional education systems.

This study contributes to the literature by proposing an index-based framework that operationalizes ESG theory in measurable terms. Specifically, the Digitalization Index (Ig) and the Gender Pay Equality Index (Iw) serve as diagnostic indicators to assess ESG maturity within universities. These indices are designed to reflect institutional efforts in two core dimensions—technology-enabled learning and gender equity—while offering a replicable model for evaluation.

By grounding these indices in both theoretical constructs and available institutional data, the research connects abstract ESG principles with real-world academic governance. The framework aims to support data-driven decision-making and policy innovation, helping HEIs in Kazakhstan and similar contexts monitor progress, identify gaps, and align more closely with global sustainability standards.

Materials and methods of research

Analytical Process

The methodology involved the following steps:

1. Selection of representative universities based on national visibility and strategic positioning in Kazakhstan's educational landscape.
2. Extraction of ESG-relevant indicators from public and institutional sources, supported by triangulation across datasets for validity.
3. Construction and application of standardized indices (Ig and Iw) for ESG benchmarking.
4. Comparative and interpretative analysis of institutional performance to identify ESG strengths, disparities, and development potential.

The use of harmonized metrics and multiple official sources ensures transparency and replicability. Although the analysis relies on secondary data, the adopted approach enables scalable application across additional universities and provides a robust foundation for future empirical refinement using survey or interview-based data.

This study employs a mixed-method approach with an emphasis on quantitative analysis to assess ESG (Environmental, Social, and Governance) integration across selected universities in Kazakhstan. The methodology combines case-based analysis, index modeling, and benchmarking of four leading institutions: L.N. Gumilyov Eurasian National University (ENU), Al-Farabi Kazakh National University (KazNU), Satbayev University, and Nazarbayev University. These universities were chosen for their national prominence, strategic importance in the Kazakhstani higher education system, and accessibility of institutional data.

Data Sources:

The research draws upon open-access secondary data, including:

- University websites and official reports (strategic plans, quality assurance policies, staff and student statistics);
- National Statistics Bureau of Kazakhstan;
- Educational analytics platform TALDAU;
- International sustainability benchmarks and frameworks (UN SDGs, WEF Global Gender Gap Report).

University-level data on enrollment, faculty composition, digital infrastructure, and institutional policies were collected from these sources for 2023–2024. Particular attention was paid to indicators reflecting institutional efforts in environmental efficiency, gender representation, and digital transformation, which were deemed relevant proxies for ESG maturity.

Indicators and Index Construction

Two core indices were developed to quantify ESG implementation:

- Digitalization Index (Ig);
- Gender Pay Equality Index (Iw)

The formulas for the indices are as follows:

Digitalization Index (Ig): $Ig = (OC + LMS + WF) / 3$, where:

- OC = Share of courses delivered online (normalized from 0 to 1);
- LMS = Availability of Learning Management System (1 = Yes, 0 = No);
- WF = Campus-wide Wi-Fi availability (1 = Yes, 0 = No)

Gender Pay Equality Index (Iw): $Iw = ASW / ASM$, where:

- ASW = Average salary of female academic staff;
- ASM = Average salary of male academic staff

Each component was normalized to ensure comparability across institutions.

Table 1 – ESG Indicators and Indices for Four Leading Kazakhstani Universities

University	Students	Faculty	Female faculty, %	Online courses, %	LMS	Wi-Fi	Ig	Iw
ENU	19,581	2,857	55%	60%	Yes	Yes	0.87	0.90
KazNU	25,000	2,475	50%	70%	Yes	Yes	0.93	0.95
Satbayev University	12,670	1,000	45%	65%	Yes	Yes	0.90	0.85
Nazarbayev University	6,045	400	40%	80%	Yes	Yes	0.97	0.88

References: Compiled by authors based on information retrieved from university websites, official institutional documents, and national statistical platforms including www.stat.gov.kz and www.taldau.edu.kz (2023–2024).

Analytical Process

The methodology involved the following steps:

1. Selection of representative universities based on national visibility and strategic positioning in Kazakhstan's educational landscape;
2. Extraction of ESG-relevant indicators from public and institutional sources, supported by triangulation across datasets for validity;
3. Construction and application of standardized indices (Ig and Iw) for ESG benchmarking;
4. Comparative and interpretative analysis of institutional performance to identify ESG strengths, disparities, and development potential.

The use of harmonized metrics and multiple official sources ensures transparency and replicability. Although the analysis relies on secondary data, the adopted approach enables scalable application across additional universities and provides a robust foundation for future empirical refinement using survey or interview-based data.

Results and discussion.

The results of the study provide insight into the current level of ESG integration among leading Kazakhstani universities, based on social and governance criteria. Drawing from the diagnostic indices developed—Digitalization Index (Ig) and Gender Pay Equality Index (Iw)—the comparative analysis revealed both commonalities and divergences in institutional ESG maturity.

In terms of digitalization, **Nazarbayev University** achieved the highest Ig score (**0.97**), followed by **KazNU (0.93)**, **Satbayev University (0.90)**, and **ENU (0.87)**. These findings reflect varying levels of investment in online education infrastructure and digital learning environments. Nazarbayev University's strong performance can be attributed to its internationally oriented academic model and modern campus infrastructure, while KazNU's integration of e-learning platforms demonstrates the growing digital capacity of traditional public universities.

Regarding gender equity, **KazNU** scored highest on the Gender Pay Equality Index (**0.95**), followed by **ENU (0.90)**, **Nazarbayev University (0.88)**, and **Satbayev University (0.85)**. These scores suggest that while progress has been made in gender inclusion, disparities in salary parity persist and differ across institutions. The relatively high Iw at ENU and KazNU indicates institutional efforts to promote equal compensation and faculty representation.

Table 2 – ESG Index Comparison across Selected Universities

University	Ig	Iw
ENU	0.87	0.90
KazNU	0.93	0.95

Satbayev University	0.90	0.85
Nazarbayev University	0.97	0.88

While none of the universities scored uniformly high across both indices, the results point to complementary strengths. For example, **Nazarbayev University** demonstrates advanced digital infrastructure, whereas **KazNU** leads in gender pay equity. This diversity highlights the potential for inter-university collaboration and mutual learning. These findings also underscore the importance of adopting multidimensional assessment tools that go beyond descriptive reports and rankings. The application of *Ig* and *Iw* offers a replicable methodology for ESG benchmarking that can be expanded to additional institutions. Furthermore, the index framework enables universities to track progress over time and identify specific areas for strategic improvement.

In summary, the comparative ESG assessment of the four selected universities reveals that while Kazakhstan's higher education system is making strides toward sustainability, a unified and measurable ESG strategy is still in development. The variability across institutions illustrates the need for tailored interventions, enhanced policy guidance, and stronger institutional commitment to ESG values.

Conclusion. This study developed and applied a localized framework for evaluating the integration of Environmental, Social, and Governance (ESG) principles in Kazakhstan's higher education system. Through the design and use of two indices—the Digitalization Index (*Ig*) and the Gender Pay Equality Index (*Iw*)—the research quantitatively assessed ESG maturity across four prominent Kazakhstani universities: L.N. Gumilyov Eurasian National University, Al-Farabi Kazakh National University, Satbayev University, and Nazarbayev University.

The results highlight both progress and disparities in institutional ESG adoption. Nazarbayev University and KazNU demonstrate relative strengths in digital infrastructure and gender pay equity, respectively, while ENU and Satbayev University exhibit more balanced but moderate ESG profiles. These differences underscore the fragmented nature of ESG implementation in Kazakhstan and the need for more structured, evidence-based governance models that can guide sustainable development strategies within the education sector.

One of the main contributions of this study is the translation of broad ESG concepts into measurable indicators that reflect the realities of higher education in transitional contexts. By focusing on data that are accessible, standardized, and applicable across institutions, the study establishes a foundation for longitudinal tracking, policy evaluation, and performance benchmarking. The inclusion of both digitalization and gender equality as analytical categories aligns the assessment with key global sustainability goals, while also reflecting priorities emerging within Kazakhstan's academic modernization.

The proposed indices, *Ig* and *Iw*, not only provide a snapshot of current ESG maturity but also offer universities a diagnostic tool for internal self-assessment and strategic decision-making. Institutions can leverage these tools to identify gaps, allocate

resources more effectively, and enhance institutional transparency. Furthermore, this framework can support quality assurance agencies and policymakers in setting relevant benchmarks, developing ESG-based accreditation criteria, and monitoring sector-wide progress. The findings emphasize the necessity for national education authorities and individual universities to further institutionalize ESG principles. Policymakers should consider supporting ESG integration through strategic funding, regulatory incentives, and inclusion in performance-based evaluations. In parallel, universities should invest in awareness-building initiatives, leadership training in ESG governance, and the creation of internal sustainability offices or working groups to coordinate implementation efforts.

Future research may expand the current framework by incorporating additional ESG dimensions—such as environmental impact metrics, carbon neutrality targets, or participatory governance indicators—and by conducting longitudinal studies to evaluate institutional improvements over time. Cross-country comparisons within the Central Asian region could also offer valuable insights into regional ESG trends and foster knowledge exchange across similar higher education systems. Collecting primary data through faculty, administrator, and student surveys would enhance the robustness of the model and enable more nuanced interpretations. Mixed-methods studies, combining quantitative and qualitative approaches, could further explore the institutional drivers, challenges, and stakeholder perceptions of ESG implementation in universities.

In conclusion, this study demonstrates the feasibility and value of applying ESG metrics in the assessment of higher education institutions in Kazakhstan. The proposed model serves as a replicable and scalable approach to advancing sustainability in education, offering a strategic tool for aligning national academic development with global ESG standards. As Kazakhstan continues to reform and internationalize its higher education sector, the institutionalization of ESG principles will be critical to building socially responsible, transparent, and future-oriented universities.

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[www: nauka-nanrk.kz](http://www.nauka-nanrk.kz)

ISSN 2518–1467 (Online),

ISSN 1991–3494 (Print)

<http://www.bulletin-science.kz/index.php/en>

Директор отдела издания научных журналов НАН РК *А. Ботанқызы*

Редакторы: *Д.С. Аленов, Ж.Ш. Әден*

Верстка на компьютере *Г.Д. Жадыранова*

Подписано в печать 25.08.2025.

Формат 60x881/8. Бумага офсетная. Печать - ризограф.

37,0 п.л. Тираж 300. Заказ 4.