

Article

Human Resource Capacity as a Determinant of Higher Education Institutional Competitiveness: Evidence from Uzbekistan and the HRSM-Compete Model

Mavluda Kengboyeva Yuldashbaevna

1. Independent Researcher, Fergana State Technical University, Fergana, 150100, Uzbekistan

* Correspondence: mykengboyeva@gmail.com

Abstract: This study investigates how human resource capacity affects the competitiveness of higher education institutions (HEIs) in Uzbekistan and develops the HRSM-Compete model for strategic human resource management in transitional higher education systems. A mixed-methods design was applied to 35 HEIs over 2020–2024. The evidence combined a faculty survey of 1,840 respondents, 105 semi-structured interviews with institutional leaders and HR officers, and a Delphi evaluation involving 70 experts. Human resource capacity was assessed using the Human Resources-Based Competitiveness Index (HR-RBI), developed from five dimensions and 38 sub-indicators. The mean HR-RBI score was 43.9 out of 100, indicating considerable differences in human resource capacity across institutional types. HR-RBI was strongly associated with institutional competitiveness ($r = 0.84$, $p < 0.001$). Panel regression further showed that a one-unit increase in HR-RBI corresponded to a 0.71-unit increase in competitiveness ($\beta = 0.71$, $p < 0.001$; $R^2 = 0.62$). Among the assessed dimensions, network-collaboration capacity had the greatest scope for strategic improvement. Comparative benchmarking also showed that Uzbekistan's HEIs remain below several international comparator systems in key HR-related indicators. Drawing on the ability–motivation–opportunity framework, dynamic capabilities theory, and the resource-based view, the HRSM-Compete model provides a structured approach for linking HR diagnostics, development programmes, and competitiveness outcomes. The findings offer an empirical basis for HEI leaders and policymakers to strengthen human resource management and institutional performance.

Keywords: human resource management; higher education competitiveness; HR-RBI; HRSM-Compete model; Uzbekistan

Citation: Yuldashbaevna, M. K. Human Resource Capacity as a Determinant of Higher Education Institutional Competitiveness: Evidence from Uzbekistan and the HRSM-Compete Model. American Journal of Economics and Business Management 2026, 9(10), 42-53

Received: 13th Jul 2026
Revised: 28th Aug 2026
Accepted: 15th Sep 2026
Published: 05th Oct 2026



Copyright: © 2026 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>)

1. Introduction

Universities worldwide face intensified competition for students, academic talent, research funding, and international recognition. This competitive pressure has prompted growing scholarly interest in identifying the sources of institutional competitive advantage [1, 2]. Among these sources, human capital — the knowledge, skills, and capabilities embodied in academic and administrative staff — is increasingly recognized as the most consequential strategic asset of knowledge-intensive organizations [3].

Yet the empirical evidence linking human resource (HR) capacity to institutional competitiveness in higher education remains surprisingly thin. Most studies examine either HR management practices or competitiveness indicators in isolation, without integrating them within a unified analytical framework [4]. This gap is particularly acute in transitional and developing economies, where higher education systems face the dual

challenge of rapid quantitative expansion and qualitative improvement under significant resource constraints [5].

In its most fundamental sense, HEI competitiveness refers to the ability of a university to maintain and strengthen its market position relative to comparable institutions [6]. This position is shaped by policy reforms, rankings, funding bodies, and the strategic actions of institutions, which together influence how universities compete for resources, talent, and prestige [7]. Faculty and staff constitute a central component of this competitive base: empirical evidence indicates that human capital, together with organizational and relational capital, has a significant influence on university performance [8]. Institutional competitiveness therefore reflects the interaction between external pressures and internal capabilities, including educational quality, research capacity, governance, human resources, and financial sustainability [9], and cannot be adequately captured by a single indicator or ranking position [10]. Existing assessment approaches, however, rarely integrate all of these dimensions simultaneously, which motivates the composite, multi-dimensional framework adopted in the present study.

Three theoretical perspectives explain why human capital occupies a privileged position among these determinants. The resource-based view holds that sustained competitive advantage derives from resources that are valuable, rare, inimitable, and non-substitutable [11]; highly qualified faculty, established research teams, and the tacit knowledge of academic communities meet these criteria and, unlike physical or financial capital, develop over extended periods and resist imitation [12]. The Ability–Motivation–Opportunity (AMO) framework specifies the mechanisms through which such resources generate performance: employees' competencies, their willingness to deploy them, and the organizational structures that enable them [13]. In higher education, these correspond to faculty qualifications, incentive and career systems, and governance, infrastructure, and international networks [14], and recent research confirms that academic researchers' performance reflects the combined effect of all three [15]. Dynamic capabilities theory adds that, in rapidly changing environments, the capacity to sense opportunities, mobilize resources, and reconfigure organizational assets matters more than static resource endowments [16, 17]; for HEIs in transitional economies, these capabilities are embedded in the quality, adaptability, and connectivity of the human resource base.

Uzbekistan presents a compelling case for investigating this relationship. Since 2017, the country has transformed its higher education system: the number of HEIs grew from 77 to over 215, enrollment coverage rose from 9.5% to 47%, and international branch campuses and private providers entered the market. The national Uzbekistan 2030 strategy targets further expansion alongside quality enhancement. However, quantitative growth has not been matched by proportional investment in faculty qualifications, research infrastructure, or international integration, while intensifying global competition for academic talent creates a persistent brain-drain risk. Central Asian higher education systems share a Soviet legacy of centralized governance, standardized curricula, and limited institutional autonomy [18], and although post-independence reforms have diverged, with Kazakhstan's Bolashak program and Nazarbayev University representing more substantial investments in internationalization [19], virtually no empirical study has systematically measured the HR–competitiveness relationship in the region or proposed an integrative model linking HR strategic management to competitive outcomes.

This paper addresses this gap through three research questions: (RQ1) What is the current state of human resource capacity across Uzbekistan's diverse HEI landscape? (RQ2) To what extent does human resource capacity predict institutional competitiveness? (RQ3) What integrative model can link HR strategic management to competitiveness enhancement in transitional higher education systems?

The study contributes in three ways. First, it develops and validates the HR-RBI (Human Resources-Based Competitiveness Index), a five-dimensional diagnostic tool comprising 38 sub-indicators, calibrated for transitional higher education contexts. Second, it provides the first empirical evidence of the HR–competitiveness relationship in Central Asian HEIs using panel data across 35 institutions over five years. Third, it introduces the HRSM-Compete model, an original framework that integrates HR

assessment and competitiveness management within a single cyclical process, grounded in AMO theory, dynamic capabilities, and the resource-based view.

2. Materials and Methods

The study employs a mixed-methods design combining quantitative assessment with qualitative contextual analysis. The sample comprises 35 HEIs selected through purposive sampling to ensure representativeness across institutional type, ownership form, educational profile, and geographic location. The sample includes 20 state universities (57%), 11 non-state institutions (31%), and 4 international branch campuses (11%). Geographically, 18 institutions (51%) are located in Tashkent and 17 (49%) in regional centers. This composition captures the institutional diversity of Uzbekistan's rapidly evolving higher education landscape.

Four data streams were employed. First, a structured faculty survey was administered to 1,840 respondents, measuring professional development opportunities, motivation, working conditions, and institutional satisfaction. Second, 105 semi-structured interviews with university administrators and HR officers explored strategic governance practices and HR policy implementation. Third, institutional documents, regulatory frameworks, and statistical reports covering 2020–2024 were systematically analyzed for all 35 institutions. Fourth, a multi-round Delphi survey involving 70 experts from higher education leadership and HR management established the weight coefficients for the HR-RBI dimensions.

Instrument reliability was confirmed across all survey dimensions: Cronbach's alpha ranged from 0.84 (academic quality dimension) to 0.91 (internationalization dimension), with all dimensions exceeding the 0.70 acceptability threshold. Construct validity was verified through confirmatory factor analysis (CFA): CFI = 0.94, RMSEA = 0.058, chi-square/df = 2.3, indicating good model fit. Expert concordance in the Delphi process was confirmed via Kendall's coefficient of concordance ($W = 0.81$, $p < 0.001$), indicating strong inter-expert agreement.

The Human Resources-Based Competitiveness Index (HR-RBI) measures institutional human resource capacity across five dimensions totaling 38 sub-indicators:

Dimension I — Intellectual capital (weight: 0.30, 9 sub-indicators): PhD holders' share, professor-to-docent ratio, average Scopus h-index, monographs, number of scientific schools, and related measures. Dimension II — Innovation-research capacity (0.25, 8 sub-indicators): grant funding volumes, patents, spin-off companies, innovative projects, start-ups. Dimension III — Pedagogical-methodological capacity (0.20, 8 sub-indicators): student evaluation index, teaching method diversity, digital competence, proportion of new courses. Dimension IV — Adaptive learning capacity (0.14, 7 sub-indicators): professional development hours, international experience, interdisciplinary activity, speed of adopting new competencies. Dimension V — Network-collaboration capacity (0.11, 6 sub-indicators): international partnership agreements, conference activity, industry linkages, professional association membership.

Sub-indicators are measured through institutional reports, surveys, expert assessment, and interview data. Each is normalized to a 0–100 scale using min–max normalization, and the aggregate HR-RBI is computed as a weighted sum. The index classifies institutions into five tiers: Strategic HR Leaders (80–100), Developing HR System (60–79), Standard HR System (40–59), HR System Requiring Renewal (20–39), and Critical HR State (0–19).

Institutional competitiveness is measured through an independently constructed Competitiveness Benchmark Index (RBI) based on 42 indicators across five dimensions: academic quality ($w = 0.28$), research activity ($w = 0.24$), financial sustainability ($w = 0.18$), social impact ($w = 0.16$), and internationalization ($w = 0.14$). The RBI is computed on a 0–100 scale and serves as the dependent variable in regression analyses. Its construction and validation are detailed in a companion study; this paper treats it as a validated criterion measure.

The HR-RBI–competitiveness relationship is assessed through Pearson correlation analysis (cross-sectional, $n = 35$) and panel data regression using a random effects model.

The panel dataset covers 2020–2024 ($n = 35$ institutions, $T = 5$ years, $N = 175$ observations), enabling examination of the relationship while controlling for unobserved time-invariant institutional heterogeneity. Effect sizes are reported using Cohen's d [20].

3. Results

The average HR-RBI across 35 HEIs was 43.9 out of 100, placing the national system in the Standard HR System tier. Table 1 presents disaggregated results by institutional type and HR dimension, including Kazakhstan as a regional benchmark.

Table 1. HR-RBI scores by institutional type and dimension (0–100 scale)

HR dimension	Mean	State	Private	Foreign	Regional	Kazakhstan
I. Intellectual capital	47.3	49.1	40.2	72.4	38.6	68.4
II. Innovation-research	38.9	40.7	33.1	68.9	30.4	55.3
III. Pedagogical-method.	54.1	55.8	51.4	74.2	49.3	66.2
IV. Adaptive learning	42.6	43.8	38.7	69.1	35.2	58.7
V. Network-collaboration	33.7	34.2	29.8	67.3	25.6	51.4
HR-RBI (aggregate)	43.9	45.8	38.7	71.3	36.1	62.0

Note: Kazakhstan data based on comparative benchmarking (Delphi-weighted averages from secondary sources and national HE statistics).

Three patterns are immediately apparent. First, international branch campuses substantially outperform all domestic categories (71.3 vs 43.9 overall), scoring in the Developing HR System tier while the national average falls in the Standard tier. Second, regional institutions (36.1) score nearly 10 points below the national mean, falling into the Requiring Renewal tier — a gap that reflects disparities in faculty recruitment, infrastructure, and international connectivity. Third, the weakest dimension across all institution types is network-collaboration capacity (33.7), indicating systemic underinvestment in international partnerships, academic networks, and industry linkages.

Kazakhstan's comparative scores exceeded Uzbekistan's averages by 15–20 points across all dimensions, with the widest gap in network-collaboration (51.4 vs 33.7) and the narrowest in pedagogical-methodological capacity (66.2 vs 54.1). This suggests that Uzbekistan's pedagogical foundation, while weaker than Kazakhstan's, represents its closest point of parity.

3.1. The HR-competitiveness relationship

Pearson correlation analysis confirmed a strong positive association between HR-RBI and institutional competitiveness ($r = 0.84$, $p < 0.001$, Cohen's $d = 1.41$). All five HR dimensions individually correlated significantly with competitiveness outcomes. Table 2 presents the full results.

Table 2. Pearson correlations between HR-RBI dimensions and institutional competitiveness

HR dimension	r	p	Cohen's d	Practical significance
I. Intellectual capital	0.81	<0.001	1.24	Very high

HR dimension	r	p	Cohen's d	Practical significance
II. Innovation-research	0.76	<0.001	1.10	High
III. Pedagogical-method.	0.69	<0.001	0.92	High
IV. Adaptive learning	0.71	<0.001	0.97	High
V. Network-collaboration	0.74	<0.001	1.05	High
HR-RBI (aggregate)	0.84	<0.001	1.41	Very high

Note: n = 35. Two-tailed tests. Cohen (1988): small $d \leq 0.2$, medium $d = 0.5$, large $d \geq 0.8$.

Intellectual capital showed the strongest individual association ($r = 0.81$), consistent with RBV predictions that rare and inimitable human resources drive competitive advantage. Network-collaboration capacity, despite its lowest absolute score (33.7), exhibited the second-strongest correlation ($r = 0.74$) — a finding with important strategic implications discussed below.

Panel data regression using a random effects model (2020–2024; N = 175 observations) confirmed the relationship's robustness over time. Results are summarized in Table 3.

Table 3. Panel regression results: HR-RBI as predictor of institutional competitiveness

Parameter	Estimate	SE	t	p
HR-RBI (β)	0.71	0.09	7.89	<0.001
R ²	0.62	—	—	—
N (observations)	175	—	—	—
n (institutions)	35	—	—	—
T (years)	5	—	—	—

Note: Random effects model, 2020–2024.

A one-unit increase in HR-RBI is associated with a 0.71-unit increase in institutional competitiveness. The coefficient of determination ($R^2 = 0.62$) indicates that human resource capacity alone accounts for approximately 62% of the variance in competitiveness outcomes across institutions and years. This is a substantial proportion, particularly given that competitiveness is influenced by numerous factors including financial resources, geographic location, historical reputation, and policy environment.

3.2. HR capacity and institutional outputs

To illustrate how HR-RBI differences translate into tangible institutional outputs, Table 4 compares research and innovation performance across three leading universities and the national average. These institutions represent the upper range of the HR-RBI distribution.

Table 4. Research and innovation outputs of leading HEIs vs national average

Indicator	NUUZ	TIIAME	SamSU	National avg
Grants (bln UZS)	85	72	60	48
Patents	18	22	11	9
Spin-off companies	6	5	3	2
International projects	24	21	15	10

Note: NUUZ = National University of Uzbekistan; TIIAME = Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (National Research University); SamSU = Samarkand State University. Data: institutional reports, 2023–2024.

The pattern is striking: the two institutions with the highest HR-RBI scores (NUUz, TIIAME) produce roughly double the grants, patents, and international projects of the system average. NUUz and TIIAME are the only Uzbek universities ranked in the QS Top-1000 and THE Impact Rankings 201–300 bracket, with 780+ and 650+ Scopus publications respectively. This association between HR capacity and measurable research outputs provides concrete evidence that the statistical relationship identified in Section 3.1 operates through observable institutional productivity channels.

3.3. International benchmarking

To contextualize these findings, HR management practices were compared across eight national systems. Table 5 presents the comparison.

Table 5. International comparison of HEI human resource management systems

Country/group	QS rank	PhD %	Intl. staff %	R&D/salary %	HR-strategy integration	CPD hrs/yr
USA (Top-50)	≤50	96	38	42	High	120
UK (Top-50)	≤75	94	41	38	High	100
Singapore (NUS/NTU)	≤15	91	52	45	Very high	140
China (Top-5)	100–300	88	18	36	Medium–high	90–120
South Korea	100–250	90	25	35	Medium–high	100–120
Russia (Top-10)	300–600	82	12	22	Medium	60–80
Kazakhstan (NU)	200–500	75	35	31	Medium	80–100
Uzbekistan (avg)	Unranked	48	4	14	Low	30–40
Uzbekistan (leaders)	Top-1000	62	7	18	Medium–low	50–60

Note: CPD = Continuing Professional Development. Data: QS (2025), THE (2025), institutional reports, published studies.

The comparison reveals the scale of the HR challenge. Uzbekistan's average PhD faculty share (48%) is approximately half that of leading systems (91–96%). International staff representation (4%) is an order of magnitude below Singapore (52%) or the UK (41%). Research expenditure relative to payroll (14%) is the lowest among all comparators. Annual CPD hours (30–40) are one-quarter to one-third of international benchmarks. These figures validate the HR-RBI score of 43.9 and indicate substantial room for improvement, while also suggesting that targeted investment in specific dimensions could yield disproportionate competitiveness returns.

3.4. The HRSM-Compete Model

The empirical findings establish that human resource capacity is the most consequential individual predictor of HEI competitiveness in the Uzbekistan context. Building on this evidence, this section presents the HRSM-Compete (Human Resource Strategic Management for Competitiveness) model as a theoretically grounded framework for translating HR investment into competitive outcomes.

3.5. Theoretical architecture

The model rests on three theoretical pillars. From AMO theory, it adopts the triadic structure of ability, motivation, and opportunity as the organizing principle for HR interventions. From dynamic capabilities theory, it incorporates the imperative of continuous adaptation and resource reconfiguration. From the resource-based view, it treats qualified academic personnel as a non-substitutable strategic asset.

The model distinguishes itself from existing approaches in three ways. First, it integrates HR assessment and competitiveness measurement within a single cyclical management process, justified by the empirical finding that HR-RBI explains 62% of competitiveness variance. In most existing frameworks, HR evaluation and institutional performance assessment operate as separate administrative functions, which obscures the causal pathway and delays strategic response. Second, the model is contextualized for transitional economies, incorporating governance structures, funding mechanisms, and labor market dynamics specific to post-Soviet higher education systems. Third, it employs double-loop learning: the monitoring stage feeds back not only to operational adjustments (single loop) but also to the strategic diagnostics stage, enabling periodic reassessment of the assumptions underlying HR policy.

3.6. Operational structure

The HRSM-Compete model operates through six sequential stages. Table 6 summarizes each stage's core actions, tools, expected outcomes, and recommended frequency.

Table 6. HRSM-Compete model: operational stages

Stage	Name	Core actions	Tools	Frequency
1	Strategic diagnostics	HR-RBI measurement; gap analysis; competitive environment scanning	HR-RBI methodology; SWOT-HR; benchmarking	Annually (3–4 months)
2	Strategic alignment	HR–institutional strategy integration; HR goals and KPIs	BSC-HR; OKR methodology; Strategy Map	After diagnostics (2–3 months)
3	HR development programs	Targeted programs across all 5 HR-RBI dimensions	Training needs analysis; individual development plans; mentoring	Continuous; annual planning
4	Motivation and retention	Differentiated incentives; academic career pathways	Total Rewards model; academic tenure; career lattice	Continuous; annual review
5	Monitoring and evaluation	HR-RBI dynamics tracking; performance feedback	HR dashboard; People Analytics; 360° feedback	Quarterly
6	Strategic decision	Link HR outcomes to competitiveness; adjust strategy	RBI–HR correlation analysis; board review	1–2x per year

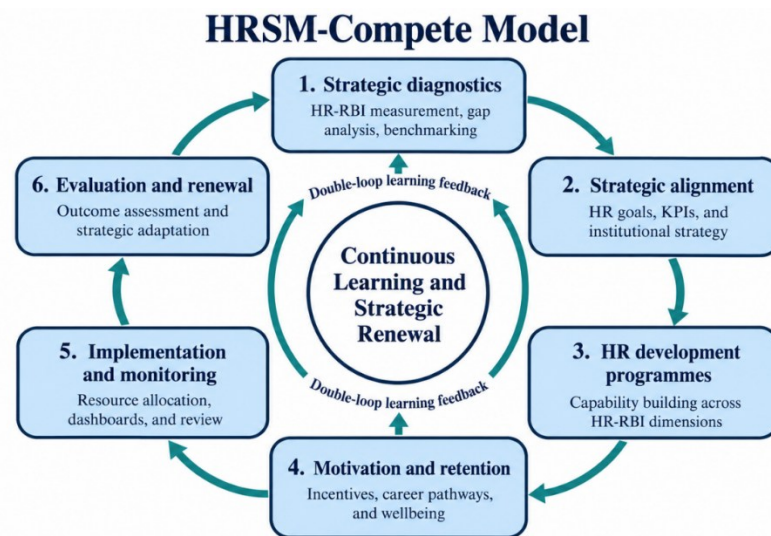


Figure 1. HRSM-Compete model: six-stage cyclical structure with double-loop learning feedback.

4. Discussion

4.1. Theoretical contributions

The study yields three theoretical contributions. First, it demonstrates that integrating HR measurement and competitiveness assessment within a unified model produces substantial explanatory power ($R^2 = 0.62$). This supports the proposition that human resources function not merely as one input among many, but as a mediating mechanism through which institutional strategy is translated into competitive outcomes. The integration perspective represents a theoretical advance over approaches that treat HR evaluation and performance measurement as separate domains.

Second, the finding that network-collaboration capacity exhibited the lowest absolute score (33.7) yet the second-strongest correlation with competitiveness ($r = 0.74$) has important implications for dynamic capabilities theory. It suggests that in transitional higher education systems, where pedagogical capacity has been historically prioritized (scoring highest at 54.1), the marginal return on investment in relational and collaborative capabilities may be substantially higher than continued investment in already-developed dimensions. This is consistent with Teece's [16] argument that sensing and recombinatory capabilities contribute disproportionately to competitive advantage in rapidly changing environments.

Third, and most significantly, the study extends the AMO framework from the individual to the institutional level. While Appelbaum et al. [13] conceptualized AMO as determinants of individual employee performance, the HRSM-Compete model demonstrates that institutional competitiveness can be understood through the same triadic lens: collective Ability (intellectual capital, measured through HR-RBI Dimension I), institutional Motivation structures (captured in the retention and incentive systems of Stage 4), and organizational Opportunity (governance, infrastructure, and networks, reflected in Dimensions IV and V). This institutional-level AMO application is, to our knowledge, novel in the higher education management literature.

4.2. Explaining the HR gaps: qualitative evidence

The quantitative findings raise a critical question: why are specific HR dimensions so underdeveloped? The qualitative evidence from 105 semi-structured interviews with university administrators and HR officers helps explain the structural mechanisms behind the numerical patterns.

The low network-collaboration score (33.7) reflects several converging constraints identified by respondents. International academic partnerships remain dependent on individual faculty initiative rather than institutional strategy. Language barriers, limited

travel funding, and bureaucratic approval processes for international agreements were consistently cited as obstacles. Industry linkages are hampered by weak technology transfer infrastructure: spin-off companies remain rare (national average: 2), and dedicated technology transfer offices exist only in a handful of leading institutions.

The innovation-research gap (38.9) is closely tied to funding structures. Interviewees emphasized that research expenditure as a proportion of total university budgets remains low by international standards, and that available funding is concentrated in a small number of leading institutions. Regional universities face a compounding disadvantage: lower base funding, difficulty recruiting PhD-qualified faculty, and limited access to international grant programs create a self-reinforcing cycle of underperformance.

The relatively strong pedagogical-methodological score (54.1) was attributed by respondents to the historical emphasis on teaching quality in the post-Soviet academic tradition, supported by regular methodological training requirements and peer observation practices. However, several administrators noted a growing tension: the pedagogical tradition prioritizes knowledge transmission over research productivity, creating an institutional culture where teaching excellence and research ambition are perceived as competing rather than complementary goals. Rebalancing this relationship emerges as a key strategic challenge.

4.3. Practical implications

The findings yield four actionable recommendations for HEI leaders and policymakers in transitional systems. First, prioritize network-collaboration investment. The gap between this dimension's low current state (33.7) and its strong competitiveness correlation ($r = 0.74$) represents the largest untapped strategic opportunity. Concrete actions include funded international partnership programs, joint research initiatives, and structured industry collaboration mechanisms.

Second, address regional disparities through differentiated HR policies. The 9.7-point gap between regional (36.1) and capital-city institutions (45.8) in HR-RBI reflects structural inequalities in faculty recruitment, professional development access, and international exposure. Targeted interventions — faculty mobility programs, remote CPD platforms, and differentiated funding formulas — could help close this gap.

Third, adopt the HR-RBI as a regular institutional diagnostic tool. Rather than treating HR assessment as an occasional audit, embedding the five-dimensional measurement within annual strategic planning cycles enables evidence-based resource allocation and progress monitoring.

Fourth, use the HRSM-Compete model's six-stage cycle as a governance framework. The double-loop feedback structure ensures that not only operational outcomes but also strategic assumptions are periodically reassessed — a critical capability in rapidly reforming systems where policy environments shift frequently.

To operationalize these recommendations, Table 7 presents a prioritized strategy matrix derived from the empirical analysis, ranking eight HR-related competitive strategies by impact, implementation complexity, and time horizon.

Table 7. Competitive strategy priorities for HEI human resource development

Strategy	Impact	Complexity	Time horizon	Priority
Align curricula with labor market needs	High	Medium	Medium-term	1
Faculty professional development	High	Medium	Continuous	2
Digital management platform	High	High	Medium-term	3

Strategy	Impact	Complexity	Time horizon	Priority
Regular student satisfaction measurement	Medium–high	Low	Short-term	4
Research and start-up support	High	High	Long-term	5
International accreditation preparation	High	High	Long-term	6
Marketing and branding strategy renewal	Medium–high	Medium	Short-term	7
Financial diversification	High	High	Medium-term	8

The matrix reveals that the two highest-priority strategies — curriculum–labor market alignment and faculty professional development — combine high impact with manageable complexity. These represent the most efficient entry points for institutions beginning their strategic HR transformation. The lower-ranked strategies (international accreditation, financial diversification) are equally important but require longer implementation horizons and greater institutional capacity, making them more appropriate for institutions already in the Growing or Leader tiers.

4.4. Limitations and future research

Several limitations should be acknowledged. First, the cross-sectional correlation analysis, while supplemented by panel regression, cannot establish strict causality; quasi-experimental designs (e.g., evaluating the impact of specific faculty development programs on institutional outcomes before and after implementation) would strengthen causal inference. Second, while the Delphi-based weight assignment achieved strong concordance (Kendall $W = 0.81$) and CFA confirmed construct validity, composite indices inevitably involve normative choices; future work could explore data-driven weighting (e.g., principal component weights) as a robustness check. Third, the Kazakhstan comparison relies on secondary data and aggregate estimates; a direct bilateral study with institutional-level Kazakhstan data would provide more rigorous benchmarking.

Fourth, the study focuses on Uzbekistan, limiting direct generalizability. However, the HR-RBI instrument and HRSM-Compete model are designed for cross-country adaptation, and validation in neighboring Central Asian systems (Kazakhstan, Kyrgyzstan, Tajikistan) would test the model's portability. Future research should also incorporate student and employer perspectives alongside the faculty and administrator voices represented here, and add non-parametric robustness checks (e.g., Spearman rank correlation) to complement the Pearson results reported in this study.

5. Conclusion

This study investigated the relationship between human resource capacity and institutional competitiveness across 35 higher education institutions in Uzbekistan and proposed the HRSM-Compete model as an integrative framework for strategic HR management in transitional systems. Three principal findings emerge.

First, Uzbekistan's HEI system has an average HR-RBI of 43.9, with substantial disparities between international branch campuses (71.3), state universities (45.8), private institutions (38.7), and regional institutions (36.1). The weakest dimension system-wide is network-collaboration capacity (33.7), while pedagogical-methodological capacity is the strongest (54.1). Second, human resource capacity is a powerful predictor of institutional competitiveness: the aggregate HR-RBI correlates at $r = 0.84$ with institutional outcomes, and panel regression confirms that each unit of HR improvement yields 0.71 units of

competitiveness gain, explaining 62% of the variance. Third, the HRSM-Compete model, integrating AMO theory, dynamic capabilities, and the resource-based view within a six-stage cyclical process with double-loop learning, provides a theoretically grounded and empirically justified framework for linking HR investment to competitive outcomes.

The policy implication is clear: for transitional higher education systems seeking to enhance competitiveness, strategic investment in human resource capacity — particularly in currently underdeveloped collaborative and innovative dimensions — offers the highest expected return. The HR-RBI diagnostic tool and HRSM-Compete governance model are offered as practical instruments for this purpose, applicable beyond Uzbekistan to other systems navigating the dual challenge of expansion and quality enhancement.

REFERENCES

- [1] E. Hazelkorn, *Rankings and the Reshaping of Higher Education: The Battle for World-Class Excellence*, 2nd ed. London, UK: Palgrave Macmillan, 2015.
- [2] S. Marginson, "What drives global science? The four competing narratives," *Studies in Higher Education*, vol. 47, no. 8, pp. 1566–1584, 2022.
- [3] E. Becker and M. A. Huselid, "Strategic human resources management: Where do we go from here?," *Journal of Management*, vol. 32, no. 6, pp. 898–925, 2006.
- [4] Bos-Nehles, M. Renkema, and M. Janssen, "HRM and innovative work behaviour: A systematic literature review," *Personnel Review*, vol. 46, no. 7, pp. 1228–1253, 2017.
- [5] P. G. Altbach, L. Reisberg, and H. de Wit, Eds., *Responding to Massification: Differentiation in Postsecondary Education Worldwide*. Rotterdam, Netherlands: Sense Publishers, 2019.
- [6] A. Reznik, Yu. S. Ponomarenko, and L. S. Paramonova, "Otsenka faktorov konkurentosposobnosti vuza v sovremennykh usloviyakh [Assessment of factors of university competitiveness in modern conditions]," *Internet Journal "World of Science"*, no. 1, Art. no. 12PMN115, 2015. [Online]. Available: <https://mir-nauki.com/PDF/12PMN115.pdf>.
- [7] K. Kettunen, K. Alajoutsijärvi, J. A. Hunnes, and R. Pinheiro, "Emergence and early institutionalization of competition in higher education: Evidence from Finnish business schools," *Tertiary Education and Management*, vol. 29, pp. 365–389, 2023, doi: 10.1007/s11233-022-09104-9.
- [8] N. Chatterji and R. Kiran, "The influence of human, organizational and relational capital of universities on their performance: A developing economy perspective," *Journal of Intellectual Capital*, vol. 24, no. 3, pp. 799–829, 2023, doi: 10.1108/JIC-03-2021-0087.
- [9] P. F. Hart and W. Rodgers, "Competition, competitiveness, and competitive advantage in higher education institutions: A systematic literature review," *Studies in Higher Education*, vol. 49, no. 11, pp. 2153–2177, 2024, doi: 10.1080/03075079.2023.2293926.
- [10] Y. Sun, T. Qin, J. Zhang, K. Yang, and X. Zhu, "Measurement of higher education competitiveness level and regional disparities in China from the perspective of sustainable development," *Economics*, vol. 18, no. 1, Art. no. 20220122, 2024, doi: 10.1515/econ-2022-0122.
- [11] Barney, "Firm resources and sustained competitive advantage," *Journal of Management*, vol. 17, no. 1, pp. 99–120, 1991.
- [12] V. Ambrosini and C. Bowman, "What are dynamic capabilities and are they a useful construct in strategic management?," *International Journal of Management Reviews*, vol. 11, no. 1, pp. 29–49, 2009.
- [13] E. Appelbaum, T. Bailey, P. Berg, and A. L. Kalleberg, *Manufacturing Advantage: Why High-Performance Work Systems Pay Off*. Ithaca, NY, USA: Cornell University Press, 2000.
- [14] D. Guest, "Human resource management and performance: Still searching for some answers," *Human Resource Management Journal*, vol. 21, no. 1, pp. 3–13, 2011.
- [15] C. Benítez-Núñez, N. L. Díaz-Díaz, J. L. Ballesteros-Rodríguez, and P. de Saá-Pérez, "Explaining academic researchers' performance from the Ability–Motivation–Opportunity (AMO) perspective," *Studies in Higher Education*, vol. 49, no. 12, pp. 2423–2440, 2024, doi: 10.1080/03075079.2024.2307965.
- [16] D. J. Teece, G. Pisano, and A. Shuen, "Dynamic capabilities and strategic management," *Strategic Management Journal*, vol. 18, no. 7, pp. 509–533, 1997.

-
- [17] D. J. Teece, "The foundations of enterprise performance: Dynamic and ordinary capabilities in an economic theory of firms," *Academy of Management Perspectives*, vol. 28, no. 4, pp. 328–352, 2014.
 - [18] Silova, "Higher education reforms and global geopolitics," *Russian Analytical Digest*, no. 97, pp. 9–12, 2011.
 - [19] Sagintayeva and K. Kurakbayev, "Higher education in Central Asia," in *Third International Handbook of Globalisation, Education and Policy Research*, J. Zajda, Ed. Cham, Switzerland: Springer, 2021, pp. 1–18.
 - [20] Cohen, *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed. Hillsdale, NJ, USA: Lawrence Erlbaum Associates, 1988.