

## Validation of a Model for Retaining Academic Human Capital in the Face of Elite Migration: A Structural Equation Modeling Study Based on the Perspectives of Talented Postgraduate Students

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### Abstract

**Purpose:** This study aimed to validate a conceptual model for retaining academic human capital in the context of elite migration, based on the perspectives of talented postgraduate students at the universities of East Azarbaijan Province.

**Methodology:** The study was applied in nature and employed a descriptive–survey design. The statistical sample consisted of 217 talented postgraduate students selected through stratified random sampling. Data were collected using a 65-item questionnaire and analyzed with SmartPLS 3 software. Reliability and validity were assessed through Cronbach’s alpha, composite reliability, and convergent and discriminant validity indices.

**Findings:** The proposed model demonstrated acceptable reliability and validity, and most of the hypothesized relationships were supported. In the final model, motivational–psychological factors (academic satisfaction, sense of belonging, and study–life balance), social–supportive factors (integration into the academic community and strong peer interactions), and institutional policies (employment support and a positive organizational culture) significantly reduced migration intentions. Conversely, managerial–executive weaknesses, structural–economic instability, and socio-political factors emerged as major push factors. Notably, all indicators related to effective teaching and learning, as well as several intrinsic motivational and infrastructural items, were removed from the final model.

**Conclusion:** The findings suggest that, contrary to much of the Western literature, educational and instructional factors are not decisive in retaining talented students in Iran. Instead, economic, managerial, and socio-political conditions play a more dominant role in shaping migration intentions. Therefore, policy strategies should prioritize improvements in livelihood conditions, employment opportunities, and institutional trust rather than focusing solely on instructional reforms.

**Value:** This study represents one of the first systematic attempt in Iran to validate a comprehensive indigenous model of academic talent retention using a combined meta-synthesis and PLS-SEM approach.

**Keywords:** *Academic Human Capital Retention, Elite Migration, Talented Postgraduate Students, Structural Equation Modeling (PLS-SEM), Motivational and Social-Supportive Factors*

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## Extended Abstract

**Introduction:** Elite migration, commonly referred to as "brain drain," has become a critical socio-economic and intellectual challenge for Iran over the past decades. International statistics indicate that Iran ranks among the countries experiencing a high rate of migration among highly educated individuals. According to reports by the International Monetary Fund, approximately 150,000 to 180,000 skilled professionals and students leave the country each year, resulting in significant consequences for national development. In addition, surveys show that a considerable proportion of Iran's international Olympiads medalists continue their academic and professional careers abroad. This trend reflects not only the loss of individual talents but also the gradual erosion of the country's intellectual capital. Some estimates suggest that the economic losses associated with brain drain in Iran are comparable to—or even exceed—the costs imposed by major national crises. Such evidence indicates that the phenomenon extends beyond individual mobility and represents a structural national challenge that threatens sustainable development. Despite the seriousness of this issue, research on the retention of academic human capital in Iran has remained relatively fragmented. Much of the existing literature has focused on organizational or industrial contexts, while universities—where a large portion of national talent is cultivated—have received comparatively less attention. Moreover, studies conducted in higher education have often concentrated on faculty members, whereas postgraduate students have received limited scholarly focus. This group is particularly important because postgraduate students are typically at a critical stage of career decision-making. Talented postgraduate students represent a key segment of academic human capital, as they constitute the future generation of researchers, innovators, and highly skilled professionals. Their migration therefore entails not only the loss of trained individuals but also the loss of substantial financial, educational, and social investments made by the state and higher education institutions. To address this gap, the present study aims to validate an indigenous conceptual model of academic human capital retention. The model was originally developed through a comprehensive meta-synthesis of 70 domestic and international studies. Drawing on the perspectives of talented postgraduate students at universities in East Azerbaijan Province, the study empirically tests the proposed model and identifies the most influential factors shaping students' intentions either to remain in the country or to migrate.

**Purpose:** The primary objective of this study was to validate a conceptual framework for retaining academic human capital in the context of elite migration. More specifically, the study sought to:

1. Assess the psychometric robustness—namely, the reliability and validity—of the proposed multidimensional model.
2. Identify the relative influence of causal, contextual, and intervening conditions on postgraduate students' intentions to migrate.
3. Examine the extent to which motivational, social, and institutional variables can mitigate major push factors.
4. Provide policy-relevant insights into the most effective strategies for reducing elite migration among postgraduate students in Iran.

By addressing these aims, the study endeavors to bridge the gap between theory and practice and to offer a validated, evidence-based model capable of informing policymakers and higher education administrators.



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**Methodology:** This study employed an applied, descriptive–survey design. The statistical sample consisted of 217 talented postgraduate students enrolled at Universities in East Azarbaijan Province during the 2023–2024 academic year. Participants were identified as "talented" according to institutional criteria, including academic performance, research achievements, and faculty recommendations. A stratified random sampling method was used to ensure proportional representation across gender, academic fields, and degree levels (Master's and Ph.D.).

Data were collected using a 65-item questionnaire designed to operationalize six major constructs: (1) causal conditions, including effective teaching and learning, motivational–psychological factors, and social–supportive networks; (2) contextual conditions, including institutional policies and scientific infrastructures; (3) intervening conditions, including structural–economic, managerial–executive, and socio-political–cultural constraints; (4) retention strategies, referring to proposed mechanisms for reducing migration; (5) consequences; representing the potential outcomes of migration or retention; and (6) migration tendency; which served as the dependent variable.

The validity of the instrument was established through expert review as well as the Content Validity Ratio (CVR), and Content Validity Index (CVI), both of which exceeded acceptable thresholds. Reliability was assessed using Cronbach's alpha and composite reliability, with values ranging from 0.77 and 0.93 across the measured dimensions, indicating strong internal consistency.

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3 software. This approach was selected because of its suitability for exploratory models, its flexibility in handling non-normal data distributions, and its robustness when working with relatively small sample sizes. The analysis was performed in two stages: first, evaluation of the measurement model (including reliability, convergent validity, and discriminant validity), and second, evaluation of the structural model (including path coefficients, effect sizes, and predictive relevance).

**Findings:** The validated model demonstrated acceptable psychometric properties, and most of the hypothesized relationships were statistically significant, thereby providing empirical support for the multilayered conceptual framework. The major findings are as follows:

1. **Motivational–Psychological Factors:** Variables such as academic satisfaction, self-efficacy, sense of belonging to the academic community, and study–life balance significantly reduced students' intention to migrate. These results highlight the importance of personal, emotional, and psychological attachments in talent retention .
2. **Social–Supportive Factors:** Strong peer interactions, integration into academic networks, and the presence of emotional support systems contributed to lower migration tendencies. This suggests that retention is not solely shaped by institutional or structural influences but also by students' social experiences within the academic environment.
3. **Institutional Policies and Employment Support:** Access to employment opportunities, financial support mechanisms (e.g., scholarships), and a positive organizational culture were identified as important determinants of students' decisions to remain in the country.



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4. **Push Factors:** Managerial–executive weaknesses (such as bureaucracy and lack of transparency), structural–economic instability (including low income and inadequate living conditions), and socio-political constraints emerged as the strongest drivers of migration intentions.
5. **Elimination of Educational Indicators:** Unexpectedly, all indicators related to "effective teaching and learning," along with several motivational and infrastructural variables, were removed from the final model due to weak factor loadings. This finding suggests that educational quality, in the studied context, is not a decisive determinant of student retention.
6. **Demographic Factors:** Gender, degree level, academic field, and age showed no statistically significant association with migration intention. This indicates that the migration tendency is widespread and not confined to particular demographic subgroups.
7. **Key Motivations for Migration:** The most frequently reported motivations for migration included income and livelihood concerns (91%), supportive policies abroad (84.9%), quality of education and research (84.4%), better career opportunities (83.5%), and academic freedom (79.2%).
8. **Homogeneity of Migration Tendency:** Across demographic categories, the majority of students displayed moderate to high levels of migration intention, confirming that the inclination to migrate is systemic rather than group-specific.

**Conclusion:** The findings point to a critical divergence between the Iranian context and trends commonly reported in the Western literature. Whereas educational quality, research opportunities, and pedagogical effectiveness are often decisive determinants of student retention in Western higher education systems, these factors appear to play a secondary role in Iran. Instead, economic hardship, managerial inefficiencies, and socio-political constraints overshadow educational considerations and emerge as the dominant push factors driving migration intentions.

This contrast underscores the need for retention strategies that are aligned with local structural realities. In the Iranian context, effective interventions should prioritize improvements in livelihood conditions, career development pathways, and institutional trust rather than relying solely on academic or instructional reforms. Furthermore, the lack of significant demographic differences in migration intention highlights the systemic nature of the problem, pointing to the necessity of broad, comprehensive policy measures rather than segmented or group-specific approaches.

**Value:** This research makes several key contributions:

- It presents one of the first systematic efforts in Iran to empirically validate a comprehensive, indigenous model of academic human capital retention, integrating meta-synthesis with structural equation modeling.
- It provides evidence-based insights into the relative importance of motivational, social, institutional, economic, managerial, and socio-political factors, thereby enabling policymakers to design more targeted and effective interventions.
- It challenges the assumption that enhancing instructional quality alone can reduce elite migration, demonstrating instead the primacy of economic and governance-related variables in shaping students' migration intentions.

- By focusing on postgraduate students, the study highlights a critical population at risk, whose migration entails both immediate and long-term losses for national development.

Overall, this study contributes to the scholarly literature on human capital retention while offering concrete, practice-oriented policy recommendations. It advocates multidimensional strategies that integrate financial incentives, career development opportunities, a supportive institutional culture, and improved governance to counteract the systemic drivers of elite migration.

## References

- Ababrekri, Z. (2014). *The effect of organizational citizenship behavior and spirituality on human resource retention strategy* (Master's thesis, Allameh Tabataba'i University). IranDoc. <https://ganj.irandoc.ac.ir/#/articles/f3c06f321d0d86ba73a4a8627fb51864> [In Persian]
- Abbaszadeh, M. M., Amani Saribegloo, J., Khazri Azar, H., & Pashoui, Q. (2012). *Introduction to structural equation modeling using the PLS method and its application in behavioral sciences*. Urmia University Press. [In Persian]
- Ahmadnia Chenijani, A. (2014). *A pathological approach to the human resource retention system with a strategic and systemic perspective (Case study: Zahedan Municipality)* (Master's thesis, University of Sistan and Baluchestan). IranDoc. <https://ganj.irandoc.ac.ir/#/articles/2921374b9b5d1bbd7f595dad07709a53> [In Persian]
- Allen, N. J., & Meyer, J. P. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review*, 1(1), 61–89. [https://doi.org/10.1016/1053-4822\(91\)90011-Z](https://doi.org/10.1016/1053-4822(91)90011-Z)
- Azimi Ghadehkelai, O. S., Tabari, M., Bagherzadeh, M. R., & Mousavi, S. J. (2023). Presenting a model for recruitment and retention of human resources in medical universities of Mazandaran Province during the COVID-19 epidemic. *Islamic Lifestyle with Health Approach*, 7(1), 228–236. <http://islamiclifej.com/article-1-1657-fa.html> [In Persian]
- Azimi, A. (2018). *Identifying and explaining barriers to human resource retention in top Iranian universities using the Q methodology* (Doctoral dissertation, Ferdowsi University of Mashhad). IranDoc. <https://ganj.irandoc.ac.ir/#/articles/bf82ad9d0c34d5fb471e8db08e8b4803> [In Persian]
- Blachford, D. R., & Zhang, B. (2014). Rethinking international migration of human capital and brain circulation: The case of Chinese-Canadian academics. *Journal of Studies in International Education*, 18(3), 202–222. <https://doi.org/10.1177/1028315313511497>
- Brannagan, P. M., & Grix, J. (2023). Nation-state strategies for human capital development: The case of sports mega-events in Qatar. *Third World Quarterly*, 44(8), 1807–1824. <https://doi.org/10.1080/01436597.2023.2196718>
- Braxton, J. M. (1999). Theory elaboration and research and development: Toward a fuller understanding of college student retention. *Journal of College Student Retention: Research, Theory & Practice*, 1(2), 93–97. <https://doi.org/10.2190/V7Y9-4Q2T-LTLY-V0Y8>
- Chin, W. W. (1998). Issues and opinion on structural equation modeling. *MIS Quarterly*, 22(1), vii–xvi.
- Chin, W. W., Marcolin, B. L., & Newsted, P. R. (1996). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and voice mail emotion/adoption study. In *Proceedings of the 17th International Conference on Information Systems* (pp. 21–41).



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- Darawsheh, N., Alkailanee, K., Alquran, N., Al-Dawuod, T., Nawafleh, M., Jaradat, H., ... & Al-Shamali, S. (2023). Leading with love and its relationship to faculty members' job loyalty in Jordanian universities. *Information Sciences Letters*, 12(8), 2511–2520. <https://doi.org/10.18576/isl/120824>
- Dustmann, C., Fadlon, I., & Weiss, Y. (2011). Return migration, human capital accumulation and the brain drain. *Journal of Development Economics*, 95(1), 58–67. <https://doi.org/10.1016/j.jdeveco.2010.04.006>
- Faggian, A., Rajbhandari, I., & Dotzel, K. R. (2018). The interregional migration of human capital and its regional consequences: A review. In *Transitions in regional economic development* (pp. 227–256). Routledge.
- Ghorbanipour, A. R. (2017). *A comparative study of human resource systems in recruitment, retention, and development (Case study: Selected oil companies)* (Master's thesis, University of Tehran). IranDoc. <https://ganj.irandoc.ac.ir/#/articles/df9e454cc1a746e68778518e2a483305> [In Persian]
- Hamzavi, H., Mohebi, A., Khademi, A., & Rezaeimanesh, B. (2023). The effect of sustainable human resource management on human resource retention with the mediating role of social capital. *Transformative Human Resources Journal*, 2(7), 20–38. <https://magiran.com/p2645639> [In Persian]
- Herzberg, F., Mausner, B., & Snyderman, B. B. (1959). *The motivation to work*. John Wiley & Sons.
- Homan, H. A. (2008). *Structural equation modeling using LISREL software*. SAMT Publications.
- Kanter, R. M. (1977). *Men and women of the corporation*. Basic Books.
- Khademian Ravandi, S. (2022). *Human resource retention strategies in knowledge-based companies* (Doctoral dissertation, Allameh Tabataba'i University). IranDoc. <https://ganj.irandoc.ac.ir/#/articles/c88dcba1f1fa792fe92c6b21e2b58f1d> [In Persian]
- Mahroum, S. (2000). Highly skilled globetrotters: Mapping the international migration of human capital. *R&D Management*, 30(1), 23–32. <https://doi.org/10.1111/1467-9310.00154>
- Mazzarol, T., & Soutar, G. N. (2002). “Push–pull” factors influencing international student destination choice. *International Journal of Educational Management*, 16(2), 82–90. <https://doi.org/10.1108/09513540210418403>
- Mixon, F. G., Jr., & Hsing, Y. (1994). College student migration and human capital theory: A research note. *Education Economics*, 2(1), 65–73. <https://doi.org/10.1080/09645299400000006>
- Moeinian, B., Elyasi, M., Bamdad Soufi, J., & Seyed Naqavi, M. A. (2021). Designing a model for retaining knowledge workers in knowledge-based manufacturing companies (Case study: ICT and biotechnology companies). *Sustainable Human Resource Management*, 3(4), 89–111. <https://doi.org/10.22080/shrm.2021.3321> [In Persian]
- Naderi Safa, E. (2015). *Pathology of the talent management and human resource retention system in the General Directorate of Sports and Youth and the Department of Education of Qom* (Master's thesis, University of Tehran). IranDoc. <https://ganj.irandoc.ac.ir/#/articles/396f6a62fb517e5aaeaf5694b905663> [In Persian]
- Nnoruga, J. N., & Osigwe, C. N. (2023). Brain drain in Nigeria: A challenge to human capital development. *Nigerian Journal of African Studies*, 5(2), 23-31. <https://nigerianjournalsonline.com/index.php/NJAS/article/view/3366>.
- Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students: Findings and insights from twenty years of research*. Jossey-Bass.
- Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research* (Vol. 2). Jossey-Bass.
- Radmardi, A. (2020). *Identifying the dimensions of internal marketing and its effect on human resource retention in Hormozgan Customs* (Master's thesis, University of Hormozgan). IranDoc.



<https://ganj.irandoc.ac.ir/#/articles/6417fbeb26476260edeb964465617999> [In Persian]

- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Safari, Z., Alvani, S. M., Zarei Matin, H., & Safari, M. (2022). Antecedents of human resource retention with emphasis on the role of job embeddedness: A mixed meta-study. *Journal of Organizational Culture Management*, 21(1), 1–20. <https://doi.org/10.22059/jomc.2021.315714.1008206> [In Persian]
- Salavati, B. (2021). *Iran migration yearbook 2021*. Vice Presidency for Science and Technology, Sharif University of Technology Policy Research Institute, Iran Migration Observatory. <https://migrationobservatory.ir/> [In Persian]
- Salimi, M., Khodaparast, M., & Nikou, P. S. (2023). Causes and consequences of Iranian elite athletes' international migrations. *Physical Culture and Sport: Studies and Research*, 102(1), 41–57. <https://doi.org/10.2478/pccsr-2023-0004>
- Sepeshri, S., Salajeghe, S., Mollaiy, H. R., Sayadi, S., & Shokoh, Z. (2024). Designing a model to create a suitable platform in order to maintain human capital and increase the productivity of the organization in the central building of Iran Oil Company. *International Journal of Nonlinear Analysis and Applications*, 15(4), 203–208. <https://doi.org/10.22075/ijnaa.2022.28480.3904>
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). University of Chicago Press.
- Vahed, M. (2021). *Pathology of the human resource retention system in the Air Force of the Islamic Republic of Iran Army* (Master's thesis, Payame Noor University). IranDoc. <https://ganj.irandoc.ac.ir/#/articles/2921147e315546d627929965fa738501> [In Persian]
- Zakharenko, R. (2012). Human capital acquisition and international migration in a model of educational market. *Regional Science and Urban Economics*, 42(5), 808–816. <https://doi.org/10.1016/j.regsciurbeco.2012.05.001>



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