

Article

Assessing the Integration of Higher Education and Employers in the Innovation Ecosystem based on Labor Market Requirements

Uzaydullayev Sherzod Shukurullayevich^{1*}

1. Doctor of Philosophy (PhD) in Economics, Associate Professor, Gulistan State University, Uzbekistan

*Correspondence: sherzodbek.uz1986@mail.ru, ORCID: 0009-0002-0212-0754

Abstract: This study examines the integration of higher education institutions and employers within the innovation ecosystem from the perspective of labor market requirements. Particular attention is paid to the extent to which the quality of graduate training, professional competencies, practical skills, digital capabilities, and educational outcomes correspond to employers' expectations. The empirical analysis is based on an employer survey conducted within the Finance education program, allowing the level of interaction between higher education and the labor market to be assessed through quantitative indicators. The study applies survey analysis, a Likert-scale assessment, comparative analysis, statistical grouping, and an integrated evaluation approach. The results identify existing gaps between graduate competencies and employer requirements and reveal the key factors influencing the effectiveness of university–employer cooperation. Based on the findings, priority directions are proposed for strengthening employer participation in curriculum development, expanding practice-oriented education, improving professional and digital competencies, and developing sustainable university–industry partnerships. The proposed approach contributes to improving the management of higher education–employer integration and increasing the responsiveness of higher education to changing labor market demands.

Citation: Shukurullayevich, U. S. Assessing the Integration of Higher Education and Employers in the Innovation Ecosystem based on Labor Market Requirements. American Journal of Economics and Business Management 2026, 9(9), 923-930

Received: 24th Jun 2026

Revised: 20th Jul 2026

Accepted: 25th Aug 2026

Published: 26th Sep 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/>)

Keywords: innovation ecosystem, higher education, employers, labor market, integration, Finance education program, graduate competencies, educational quality, professional skills, university–industry cooperation.

1. Introduction

The rapid transformation of the labor market, digitalization of financial services, and increasing demand for practice-oriented professional competencies have strengthened the need for effective integration between higher education institutions and employers [1]. Within an innovation ecosystem, universities are expected not only to provide theoretical knowledge but also to develop professional, analytical, digital, communication, and decision-making skills that correspond to changing labor market requirements [2].

In this context, university–employer cooperation becomes an important mechanism for improving the quality and economic relevance of higher education [3]. Employer participation in curriculum development, practical training, professional internships, and competency assessment helps reduce the gap between educational outcomes and actual workplace requirements. This issue is particularly important in finance and related fields,

where digital financial technologies and data-driven decision-making are rapidly transforming professional requirements [4]. The empirical basis of this study includes a survey of 170 employers assessing the professional preparedness of graduates in the Finance-related education program. The assessment covers theoretical knowledge, financial and economic analysis, accounting and financial reporting, financial planning, digital technologies, independent decision-making, professional communication, teamwork, and other competencies [5]. The survey responses were processed using a five-point scale, average scores, positive-response shares, and a 0–100 competency index [6].

2. Materials and Methods

The empirical basis of the study consists of an employer survey conducted to assess the correspondence between graduate competencies and labor market requirements in the Finance education program [7]. A total of 170 respondents participated in the survey and evaluated graduates' theoretical knowledge, practical financial skills, analytical abilities, digital competencies, decision-making, professional communication, teamwork, and other professional qualities [8]. The methodological approach enables the level of higher education–employer integration to be evaluated through the actual correspondence between educational outcomes and employers' requirements [9]. Particular attention is paid to identifying competencies that require further development and determining priority areas for strengthening university–employer cooperation within the innovation ecosystem [10].

3. Results and Discussion

The effectiveness of higher education–employer integration can be assessed through the extent to which graduate competencies correspond to actual labor market requirements. In this study, the results of the survey involving 170 employers were used to evaluate the professional preparedness of graduates, the quality of acquired competencies, and employers' willingness to recruit them. The main survey indicators are presented in Table 1.

Table 1. Key results of the employer survey on the compliance of graduate competencies with labor market requirements

Indicator	Result
Total number of respondents	170
Average competency index	91.8 points
Average share of positive assessments (scores 4–5)	94.7%
Employers assessing overall professional preparedness as “fully/mainly compliant”	94.1%
Employers expressing positive willingness to hire graduates	97.1%

The survey results indicate a high level of correspondence between graduate competencies and labor market requirements. The average competency index reached 91.8 points, while 94.7% of assessments were concentrated in the positive 4–5 score range. Moreover, 94.1% of employers considered graduates' overall professional preparedness to be fully or mainly consistent with their requirements. The particularly high willingness to hire graduates (97.1%) demonstrates a strong level of employer confidence in their professional potential. These findings provide empirical evidence of a relatively high level of integration between higher education outcomes and employer requirements within the innovation ecosystem [11]. The employer survey results show that the professional competencies of Finance graduates generally meet labor market requirements. Responsibility, work discipline, professional ethics, teamwork, and financial information skills received particularly high evaluations. At the same time, digital financial technologies, data analysis, independent decision-making, leadership, and innovative

thinking require further development. The comparative results of the employer assessment are presented in Figure 1.

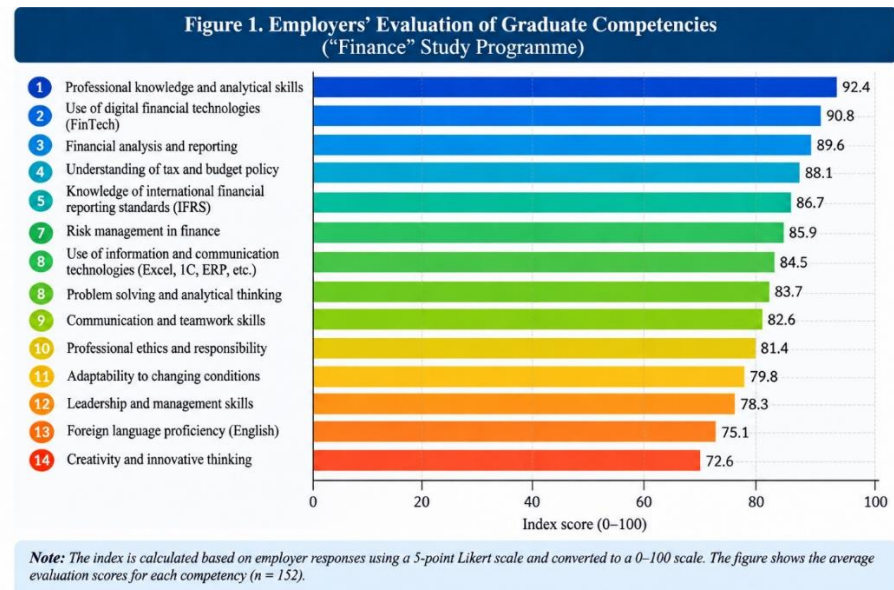


Figure 1. Employers' assessment of key competencies of graduates of the "Finance" study programme

The results presented in Figure 1 show that employers place the highest value on professional knowledge and practical skills (92.4 points), followed by FinTech competencies (90.8 points) and financial analysis skills (89.6 points). In contrast, relatively lower scores were recorded for foreign language proficiency (75.1 points) and creativity and innovative thinking (72.6 points). These differences indicate the need to strengthen practice-oriented, digital, and innovative components of higher education and deepen higher education–industry integration within the innovation ecosystem. To provide a more detailed assessment of the correspondence between graduate competencies and employer requirements, the main survey results are summarized in Table 2.

Table 2. Employer Assessment of Professional Competencies of Finance Graduates

No.	Assessed competency	Average score	Share of ratings 4–5, %	Index
1	Responsibility and adherence to work discipline	4.66	97.6	93.2
2	Timely and high-quality completion of assigned tasks	4.64	97.1	92.8
3	Compliance with professional ethics and service standards	4.62	96.5	92.4
4	Teamwork and collaboration skills	4.60	96.5	92.0
5	Self-directed learning and acquisition of new knowledge	4.58	95.9	91.6
6	Level of theoretical knowledge in the field of specialization	4.56	95.3	91.2
7	Ability to work with accounting and financial information	4.54	94.7	90.8
8	Ability to analyze financial and economic information	4.52	94.1	90.4
9	Ability to work with regulatory and legal documents	4.50	93.5	90.0
10	Professional communication and ability to justify decisions	4.48	92.9	89.6

As shown in Table 2, the competency index ranges from 89.6 to 93.2 points, indicating a generally high level of professional preparedness. The highest scores were recorded for responsibility and work discipline (93.2), timely completion of tasks (92.8), and professional ethics (92.4). These results demonstrate a strong alignment between graduate competencies and employer expectations and provide a basis for further strengthening higher education–industry integration within the innovation ecosystem [12].

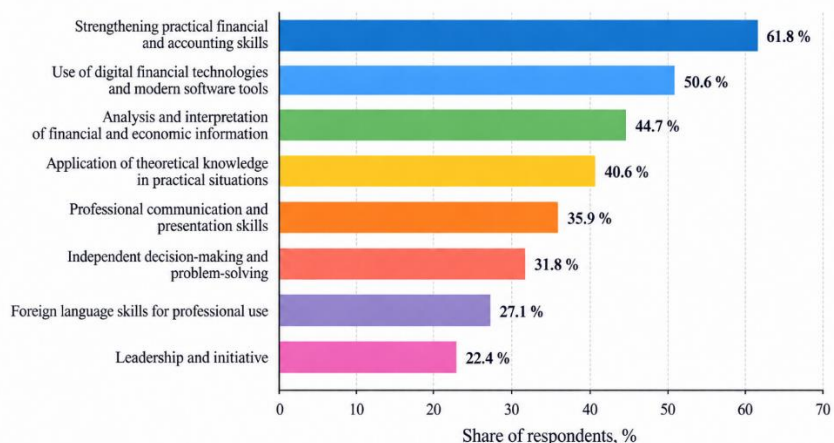
The index analysis shows that responsibility, work discipline, timely completion of tasks, professional ethics, and teamwork are among the competencies most highly valued by employers. These results indicate that graduates demonstrate a strong level of professional culture, responsibility, and ability to work effectively in a team. Positive results were also observed in financial data processing, financial and economic analysis, practical application of theoretical knowledge, use of regulatory documents, digital technologies, and independent decision-making. However, the rapid development of digitalization and financial technologies requires continuous improvement of these competencies through stronger cooperation between higher education institutions and employers within the innovation ecosystem.

Table 3. Distribution of Respondents by Overall Professional Preparedness of Graduates (n = 170)

No.	Response option	Number of responses
1	Fully prepared — able to work independently	112
2	Mostly prepared — only minor adaptation is required	48
3	Partially prepared — additional preparation is required	8
4	Not prepared — substantial improvement in professional preparation is required	2
Total		170

The survey results show that 94.1% of respondents assessed the professional preparedness of Finance graduates as either “fully prepared” or “mostly prepared.”

Figure 2. Employer opinions on competencies that require further development in Finance graduates (n = 170)



Note: Compiled by the authors based on the results of the employer survey (n = 170).

Figure 2. Employer opinions on competencies that require further development in finance graduates (n=170)

This indicates a high degree of alignment between graduate competencies and the current requirements of employers and the labor market. In particular, theoretical

knowledge, professional competencies, and the ability to work with and analyze financial and economic information were evaluated positively.

At the same time, 5.9% of respondents indicated that graduates require additional professional preparation. This highlights the need to further strengthen competencies in digital financial technologies, financial information systems, practical application of theoretical knowledge, and independent decision-making. Expanding practice-oriented training and employer participation in educational processes can therefore strengthen higher education–industry integration and improve graduate competitiveness within the innovation ecosystem. As shown in Figure 2 and Table 3, the most frequently identified area for further development is practical financial and accounting skills, selected by 61.8% of employers. This is followed by the use of digital financial technologies and modern software tools (50.6%), while 44.7% emphasized the need to strengthen graduates' ability to analyze and interpret financial and economic information [13].

Table 4. Employer-Identified Competencies Requiring Further Development among Finance Graduates

No.	Competency area	Number of responses	Share of respondents, %
1	Strengthening practical financial and accounting skills	105	61.8
2	Use of digital financial technologies and modern software tools	86	50.6
3	Analysis and interpretation of financial and economic information	76	44.7
4	Application of theoretical knowledge in practical situations	69	40.6
5	Professional communication and negotiation skills	61	35.9
6	Independent decision-making and problem-solving	54	31.8
7	Foreign language skills for professional use	46	27.1
8	Leadership and organizational skills	38	22.4

Figure 2. Employer assessment of competencies requiring further development among finance graduates. A further 40.6% of respondents identified the practical application of theoretical knowledge as an important development area. Professional communication and negotiation skills were selected by 35.9%, while 31.8% highlighted independent decision-making and problem-solving. Foreign language proficiency (27.1%) and leadership and organizational skills (22.4%) were mentioned less frequently, but remain important for professional competitiveness.

The results reveal a measurable competency gap between academic preparation and employers' practical requirements. In particular, the combined demand for practical, digital, and analytical competencies demonstrates that effective higher education–industry integration should extend beyond curriculum coordination to include joint practical training, employer participation in educational programmes, internships, digital finance laboratories, and practice-oriented projects [14].

The survey results confirm that the professional preparedness of Finance graduates is generally well aligned with employer requirements, with 94.1% of respondents assessing graduates as fully or mostly prepared for professional activity. At the same time, the findings reveal specific competency gaps: 61.8% of employers emphasized the need for stronger practical financial and accounting skills, 50.6% identified digital financial technologies and modern software skills, 44.7% highlighted financial and economic data analysis, and 40.6% pointed to the practical application of theoretical knowledge. These

results demonstrate that the key challenge is not the overall level of graduate preparation, but the need to reduce the gap between academic knowledge and rapidly changing practical, digital, and analytical requirements of employers. Therefore, effective integration within the innovation ecosystem should be based on a continuous feedback mechanism: higher education → employer requirements → competency assessment → curriculum improvement → practical training → labor market outcomes. The empirical findings thus confirm that strengthening systematic cooperation between higher education, science, and industry is an important economic and organizational mechanism for improving human capital quality, graduate competitiveness, and the responsiveness of educational programmes to labor market demand [15].

4. Conclusion

The results of the study demonstrate that the effective integration of higher education, science, and industry within the innovation ecosystem is becoming an important economic mechanism for improving the quality of human capital, ensuring the competitiveness of graduates, and aligning educational outcomes with rapidly changing labor market requirements. In this context, higher education institutions should not only provide theoretical knowledge but also respond systematically to technological changes, employer expectations, and emerging professional competency requirements.

The empirical results of the employer survey confirm a generally high level of professional preparedness among Finance graduates. In particular, 94.1% of respondents assessed graduates as either fully or mostly prepared for professional activity. High evaluations were recorded for responsibility, work discipline, professional ethics, teamwork, theoretical knowledge, and the ability to work with financial and accounting information. These results indicate a relatively strong correspondence between the competencies formed within higher education and the basic professional requirements of employers.

At the same time, the study identified a number of competency gaps that require further attention. 61.8% of employers emphasized the need to strengthen practical financial and accounting skills, 50.6% highlighted digital financial technologies and modern software tools, 44.7% identified financial and economic data analysis, and 40.6% pointed to the practical application of theoretical knowledge. These findings show that the main challenge is not a lack of fundamental professional knowledge, but the need to transform this knowledge into practical, digital, analytical, and innovative competencies demanded by the modern economy.

The findings also demonstrate that higher education–industry cooperation should move beyond traditional internships and occasional employer participation. Within an innovation ecosystem, this relationship should operate as a continuous and mutually beneficial institutional mechanism involving universities, research institutions, employers, enterprises, and other innovation actors. Employers should participate in defining competencies, improving curricula, organizing practical training, implementing joint research and innovation projects, and evaluating educational outcomes.

From an economic perspective, strengthening such integration can contribute to reducing the mismatch between graduate qualifications and labor market demand, shortening the adaptation period of young specialists in the workplace, reducing additional training costs for employers, and increasing labor productivity. At the same time, closer interaction with industry enables universities to obtain continuous information about changes in professional requirements and to adapt educational programmes more rapidly.

Therefore, the development of a sustainable “higher education–science–industry” integration model should be considered one of the key directions for improving the management of the innovation ecosystem. Particular attention should be paid to expanding practice-oriented education, strengthening digital and analytical competencies,

establishing joint university–industry laboratories and innovation platforms, involving employers in curriculum development, and introducing systematic monitoring of graduate competencies.

Based on the research results, the following recommendations are proposed:

First, a permanent “higher education–science–industry” feedback mechanism should be introduced, allowing employer requirements to be regularly reflected in curricula and learning outcomes.

Second, the share of practice-oriented education should be increased through internships, case studies, joint projects, dual education elements, and employer-led practical training.

Third, training in FinTech, digital financial platforms, data analytics, ERP systems, and modern financial software should be strengthened to reduce the digital competency gap identified by employers.

Fourth, employers should be more actively involved in curriculum development, competency assessment, practical training, and evaluation of graduate learning outcomes.

Fifth, cooperation between universities and enterprises should be transformed from occasional interaction into a long-term institutional partnership, including joint laboratories, research projects, innovation platforms, and commercialization initiatives.

Finally, an Employer–Graduate Competency Monitoring System should be established to periodically measure the gap between educational outcomes and labor market requirements. Such a mechanism would enable universities to respond more rapidly to changes in employer demand and improve the economic effectiveness of higher education–science–industry integration within the innovation ecosystem.

REFERENCES

- [1] H. Etzkowitz and L. Leydesdorff, “The dynamics of innovation: From National Systems and ‘Mode 2’ to a Triple Helix of university–industry–government relations,” *Res. Policy*, vol. 29, no. 2, pp. 109–123, Feb. 2000, doi: 10.1016/S0048-7333(99)00055-4.
- [2] H. Etzkowitz, *The Triple Helix: University–Industry–Government Innovation in Action*. New York, NY, USA: Routledge, 2008.
- [3] C. Freeman, *Technology Policy and Economic Performance: Lessons from Japan*. London, U.K.: Pinter Publishers, 1987.
- [4] B.-Å. Lundvall, Ed., *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*. London, U.K.: Pinter Publishers, 1992.
- [5] R. R. Nelson, Ed., *National Innovation Systems: A Comparative Analysis*. New York, NY, USA: Oxford Univ. Press, 1993.
- [6] M. E. Porter, *The Competitive Advantage of Nations*. New York, NY, USA: Free Press, 1990.
- [7] World Bank, *World Development Report 2019: The Changing Nature of Work*. Washington, DC, USA: World Bank, 2019, doi: 10.1596/978-1-4648-1328-3.
- [8] World Economic Forum, *The Future of Jobs Report 2025*. Geneva, Switzerland: World Economic Forum, 2025.
- [9] OECD, *University–Industry Collaboration: New Evidence and Policy Options*. Paris, France: OECD Publishing, 2019, doi: 10.1787/e9c1e648-en.
- [10] OECD, *OECD Skills Outlook 2023: Skills for a Resilient Green and Digital Transition*. Paris, France: OECD Publishing, 2023, doi: 10.1787/27452f29-en.
- [11] UNESCO, *Reimagining Our Futures Together: A New Social Contract for Education*. Paris, France: UNESCO, 2021.
- [12] European Commission, “European Skills Agenda for sustainable competitiveness, social fairness and resilience,” Communication COM(2020) 274 final, Brussels, Belgium, Jul. 2020.

-
- [13] President of the Republic of Uzbekistan, "On approval of the Concept for the development of the higher education system of the Republic of Uzbekistan until 2030," Decree No. UP-5847, Tashkent, Uzbekistan, Oct. 8, 2019.
 - [14] Statistics Agency under the President of the Republic of Uzbekistan, "Official statistical data on higher education and the labor market." [Online]. Available: <https://stat.uz/>
 - [15] S. Sh. Uzaydullayev, "Employer assessment of the professional competencies and labor-market readiness of Finance graduates (n = 170)," unpublished survey data, Gulistan State Univ., Gulistan, Uzbekistan, 2026.