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Article

Management Competencies and University–Government Collaboration in Preparing Personnel for the Civil Service

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Abstract: This article examines institutional mechanisms through which higher education institutions contribute to training for the civil service, using survey evidence from four higher education institutions in Tashkent, Uzbekistan. The cross-sectional survey included 755 respondents, of whom 704 complete observations were used in the regression analysis. The conceptual framework integrates Human Capital Theory, Institutional Theory, and the transfer-of-training perspective of Baldwin and Ford. Competency ratings were measured through five Likert-scale dimensions: digital governance, strategic thinking, analytical decision-making, communication, and ethics. Because the Breusch–Pagan test indicated heteroskedasticity, OLS estimates were reported with White HC3 robust standard errors. Research utilization (β=0.487; β^*=0.389; $p<0.001$), institutional collaboration (β=0.356; β^*=0.240; $p<0.001$), and training system (β=0.118; $p=0.003$) were positively associated with competency ratings. The model explained 35.0% of the variance in competency ratings (R^2=0.350). The interaction between institutional collaboration and research utilization was not statistically significant (β=0.012; $p=0.809$), indicating that the hypothesized synergistic moderation was not supported in the observed sample. The findings should be interpreted as associative rather than causal. The main practical implication is that formal university–government collaboration alone may be insufficient; greater attention should be given to mechanisms through which university knowledge and research outputs are used in public-sector practice.

Keywords: civil service; management competencies; university–government collaboration; research utilization; personnel training system; knowledge transfer; Uzbekistan.

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1. Introduction

Human resource development and professional competency development in the civil service are important aspects of current public management reforms. The OECD emphasizes that the effectiveness of public administration is closely related to the quality of systems for training and developing public servants (OECD, 2019). However, investment in education does not by itself guarantee improved professional performance. Human Resource Development literature explains this problem through the transfer of knowledge and skills acquired during training to the workplace, particularly the extent to which learning is applied in actual work settings (Baldwin & Ford, 1988; Swanson & Holton, 2009).

Reforms aimed at professionalizing the civil service and developing human resources in Uzbekistan are increasing the practical importance of cooperation among educational institutions, government bodies, and other institutions. However, the existence of formal reforms and institutional mechanisms does not necessarily mean that they function effectively in practice. Institutional theory suggests that organizations may sometimes pursue external legitimacy rather than efficiency (DiMaggio & Powell, 1983). In the context of public administration in the Commonwealth of Independent States (CIS) countries, Verheijen (2007) explains the gap between formal mechanisms and practical outcomes through the concept of "ritualistic conformity."

From this perspective, what matters is not university–government collaboration in itself, but the extent to which the knowledge, research, and analytical outputs generated through such collaboration are transferred into public administration practice. This approach links Human Capital Theory with the transfer-of-training perspective: when educational content and research findings are aligned with the actual needs of government bodies, the knowledge required for developing competencies can be more closely connected to practical work.

Therefore, the main objective of this study is to assess the associative relationships between institutional collaboration, the use of research findings, and the training system and competency ratings in the preparation of personnel for the civil service, based on four higher education institutions in Tashkent: Tashkent State University of Economics, Tashkent University of Information Technologies named after Muhammad al-Khwarizmi, Tashkent State Technical University named after Islam Karimov, and Turin Polytechnic University in Tashkent. The study also examines whether the use of research findings acts as a moderating factor that strengthens the relationship between institutional collaboration and competency ratings.

Research Questions:

1. *What institutional mechanisms are used by higher education institutions to prepare personnel for the civil service?*
2. *How are institutional collaboration, the use of research findings, and the training system associated with competency ratings?*
3. *Does the use of research findings moderate the relationship between institutional collaboration and competency ratings?*
4. *What are the main systemic barriers faced by higher education institutions in preparing personnel for the civil service?*

1.1 Conceptual Framework and Literature Review

1.1.1 Human Capital Theory

Human Capital Theory views education and professional training as investments in human capital. According to Becker (1964), increases in knowledge and skills can contribute positively to labor productivity and organizational performance. In the context of the civil service, if university–government collaboration strengthens the alignment of educational programs with the needs of government bodies, it may be associated with higher competency ratings.

1.1.2 Institutional Theory

Institutional Theory emphasizes that organizations are influenced not only by efficiency considerations but also by external legitimacy, regulatory requirements, and institutional expectations (DiMaggio & Powell, 1983). Therefore, the existence of memoranda, committees, or joint programs between universities and government bodies does not necessarily guarantee effective collaboration in practice. Verheijen (2007) highlights the possibility that formal mechanisms may become disconnected from practical outcomes in the context of governance in the CIS countries. In this study, this

perspective provides a theoretical basis for distinguishing between the formal existence of institutional collaboration and its actual use in practice.

1.1.3 Knowledge Transfer to Practice

Baldwin and Ford (1988) consider the application of knowledge and skills in real work settings as a central criterion for understanding training transfer. Holton (1996) and Swanson and Holton (2009) show that the organizational and institutional environment also matters in transferring training outcomes into practice. In this study, the practical application by government bodies of research and analytical outputs developed by higher education institutions is treated as an expression of the knowledge transfer mechanism.

These three theoretical approaches form a common conceptual basis for the study: Human Capital Theory explains the importance of education and knowledge; Institutional Theory explains the gap between formal mechanisms and practical outcomes; and the knowledge transfer mechanism explains how knowledge and research findings are applied in practice.

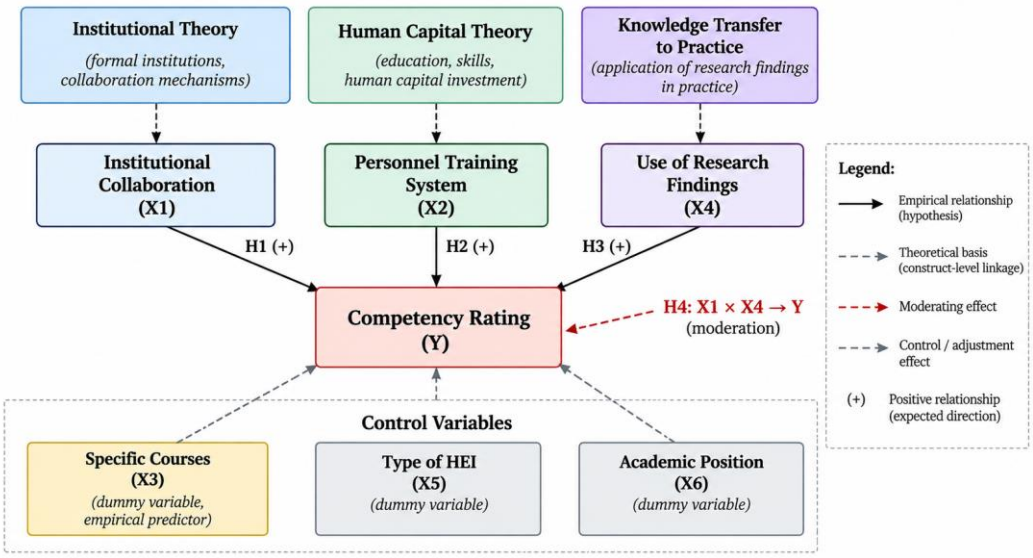


Figure 1. Conceptual Model of the Study

Note: *X1 × X4 represents the moderating hypothesis concerning the interaction between institutional collaboration and the use of research findings. X3 is an additional empirical predictor; X5 and X6 are control variables.*

The figure presents the theoretical and empirical relationships examined in the study. The conceptual model shows the logical relationships among the theoretical approaches, key variables, and the expected outcome.

Institutional Theory provides a basis for understanding the relationship between the formal forms of institutional collaboration (X1) and their practical effectiveness. Human Capital Theory explains the relationship between the personnel training system (X2), human capital, and competency development. The knowledge transfer mechanism views the practical use of research findings generated by higher education institutions (X4) as a key mechanism.

Based on this framework, the following hypotheses were formulated:

H1: Institutional collaboration (X1) is positively associated with competency ratings (Y).

H2: The civil service personnel training system (X2) is positively associated with competency ratings (Y).

H3: The use of research findings (X4) is positively associated with competency ratings (Y).

H4: The use of research findings (X4) moderates the relationship between institutional collaboration (X1) and competency ratings (Y).

In the model, specialized Courses (X3) are treated as an additional empirical predictor, while the type of higher education institution (X5) and academic position (X6) are treated as control variables. The final outcome variable is the competency rating (Y).

1.2 Research Hypotheses

Based on the conceptual framework, the following hypotheses were formulated:

H1. The level of institutional collaboration is positively associated with competency ratings.

H2. The level of research utilization is positively associated with competency ratings.

H3. The civil service personnel training system is positively associated with competency ratings.

H4. The use of research findings moderates the positive relationship between institutional collaboration and competency ratings; that is, the association between institutional collaboration and competency ratings is stronger when the use of research findings is higher.

To empirically test H4, an interaction term was included in the model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_4 + \beta_3 (X_1 \times X_4) + \text{Controls} + \varepsilon.$$

If the coefficient β_3 is statistically significant and positive, H4 is considered supported. In this study, $\beta_3 = 0.012$ and $p = 0.809$; therefore, H4 was not supported.

2. Materials and Methods

2.1 Research design and sample

The study used a cross-sectional quantitative survey design. Data were collected from four higher education institutions in Tashkent using purposive sampling. The sample included universities representing the fields of public administration, economics, information technology, and engineering. A total of 755 respondents participated in the survey; after excluding incomplete responses, 704 observations remained for the regression analysis. The fact that Tashkent State University of Economics accounted for 64.2% of the sample indicates an unequal institutional distribution.

Table 1. Distribution of the Study Sample by Higher Education Institution

Higher education institution	n	%	Main field
Tashkent State University of Economics (TSUE)	485	64,2	Economics, Management
Tashkent University of Information Technologies (TUIT)	128	16,9	Information Technology
Tashkent State Technical University (TSTU)	128	16,9	Engineering, Technology
Turin Polytechnic University in Tashkent	24	3,2	International Education
Total:	755	100,0	

Source: *Study survey. The regression analysis was conducted using 704 complete observations. Caution is required when generalizing the findings to all higher education institutions in Uzbekistan.*

2.2 Measures and variables

The dependent variable—competency rating (Y)—is an integrated measure constructed using a 1–5 point Likert scale based on five indicators: digital governance, strategic thinking, analytical decision-making, communication, and ethics. The indicators are based on approaches to civil service competencies proposed by OECD (2019) and

Kellough and Nigro (2006). This measure does not represent an objective assessment of the actual competencies of civil servants; rather, it reflects faculty members' perceptions of the competencies being developed for the civil service at higher education institutions.

The independent variables include institutional collaboration (X1), the civil service personnel training system (X2), the availability of specialized Courses (X3), and the use of research findings (X4). The control variables are the type of higher education institution (X5) and academic position (X6). The measurement indicators, scale ranges, and coding procedures for each variable are presented in a separate methodological table in accordance with the survey data.

Table 2. Type and Operational definitions of the study variables

Variable	Type	Interpretation
Y – Competency Rating	Dependent	An integrated Likert scale based on 5 indicators
X1 – Institutional Collaboration	Independent	Level of university–government collaboration
X2 – civil service personnel training system	Independent	Assessment of the civil service personnel training system
X3 – Specialized Courses	Independent	Availability of specialized Courses
X4 – Use of Research Findings	Independent	Practical use of research findings by higher education institutions
X5 – Type of Higher Education Institution	Control	Institutional profile
X6 – Academic Position	Control	Respondent's academic role

2.3 Reliability and construct validity assessment

The internal consistency of the Y scale was Cronbach's $\alpha = 0.689$ (5 items; n = 727). Although this value is close to the commonly used 0.70 threshold, it does not indicate a high level of reliability; therefore, the results should be interpreted with caution. The KMO = 0.748, while the Bartlett's test results were $\chi^2 = 585.43$; df = 10; $p < 0.001$, indicating adequate suitability of the data for factor analysis. Based on the Kaiser criterion, a one-factor solution with $\lambda_1 = 2.268$ explained 45.4% of the total variance. This can be considered preliminary evidence of construct validity, but it does not establish full construct validity; confirmatory factor analysis (CFA) would be appropriate in future studies.

Table 3. Measurement reliability and factor analysis results

Indicator	Result	Interpretation
Cronbach α	0,689	Moderate internal reliability
KMO	0,748	Suitable for factor analysis
Bartlett χ^2 (df=10)	585,43; p<0,001	The correlation matrix is suitable for factor analysis
Eigenvalue $\lambda 1$	2,268	First factor
Explained variance	45,4%	Proportion of variance explained by the one-factor solution

2.4 Regression Specification and Diagnostic Tests

The baseline OLS model is specified as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon$$

The maximum VIF value was 1.223, indicating no serious multicollinearity problems. The Breusch–Pagan test indicated heteroskedasticity (LM = 31.97; $p < 0.001$); therefore, White HC3 Robust Standard Errors were used. The Shapiro–Wilk test indicated that the residuals deviated from a normal distribution ($p = 0.003$). Given the large sample size, asymptotic arguments were used to assess the standard errors of the coefficients. However, this should not be interpreted as meaning that the "normality problem was resolved"; rather, the results were evaluated in light of the asymptotic properties of OLS inference.

2.5 Interaction Model

To test H4, an interaction term between institutional collaboration (X1) and the use of research findings (X4) was included in the model. The purpose was to examine whether X4 changes the strength of the relationship between X1 and Y, that is, whether it moderates this relationship. A statistically non-significant interaction term indicates that no statistically significant moderation effect was detected; however, this does not demonstrate that X1 and X4 have completely independent effects.

3. Results

3.1 Descriptive Statistics

Among the respondents, 78.1% reported that specialized Courses were available, 74.8% indicated that systematic collaboration programs existed, and 64.9% reported a level of institutional collaboration. The mean competency rating was M = 3.93 (SD = 1.10). At the same time, only 32.1% of respondents rated the training system as "fully responsive." This may indicate that a gap between the needs of the civil service and the educational process in the civil service personnel training system may still exist.

3.2 Reliability and Validity

The preliminary psychometric results of the measurement are presented above. The KMO and Bartlett's test results supported the suitability of the data for factor analysis, while the one-factor solution explained 45.4% of the variance. However, $\alpha = 0.689$ and the 45.4% explained variance indicate limitations in the construct measure. Therefore, it is more appropriate to describe the measure as acceptable but in need of further improvement, rather than as a "fully validated scale."

3.3 Regression Diagnostics

Test	Statistic	p	Interpretation
VIF (max)	1,223	—	No multicollinearity problems were identified.
Breusch–Pagan	LM=31,97	<0,001	Heteroskedasticity was present; HC3 robust standard errors were used.
Shapiro–Wilk	p=0,003	0,003	The residuals were not normally distributed; statistical inferences were based on the large sample size.
X1×X4	β=0,012	0,809	No statistically significant moderation effect was detected.

3.4 OLS Regression Results

The main regression model explained 35.0% of the variance in competency ratings ($R^2 = 0.350$; Adjusted $R^2 = 0.344$; $F = 62.52$; $p < 0.001$). Based on the standardized coefficients, the use of research findings was the predictor most strongly associated with competency ratings ($\beta = 0.389$), followed by institutional collaboration ($\beta = 0.240$) and the civil service personnel training system ($\beta = 0.118$*). The associations of specialized Courses, the type of higher education institution, and academic position with competency ratings were not statistically significant.

Table 4. OLS Regression estimates of the determinants of competency ratings

Predictor	β	SE(R)	t	p	β*	Decision
Constant	0.678	0.251	2.699	0.007	—	Significant
X1: Level of Collaboration	0.356	0.062	5.793	<0.001	0.240	H1 supported
X2: Civil Service Personnel Training System	0.118	0.040	2.946	0,003	0.118	H3 supported
X3: Specialized Courses	0.099	0.060	1.660	0.097	0.060	Not supported
X4: Use of Research Findings	0.487	0.047	10.478	<0.001	0.389	H2 supported
X5: Type of Higher Education Institution	-0.022	0.044	-0.515	0.607	-0.022	Not significant
X6: Academic Position	-0.,011	0.055	-0.202	0.840	-0.011	Not significant

Model: *$n = 704$; White HC3 Robust SE. β^* indicates the standardized coefficient. $R^2 = 0.350$; Adjusted $R^2 = 0.344$; $F = 62.52$; $p < 0.001$.*

3.5 Interaction and Moderation Results

The X1 × X4 interaction term was not statistically significant ($\beta = 0.012$; $p = 0.809$). Therefore, H4 was not supported. This result indicates that the study found no statistical evidence that a higher level of research utilization strengthens the relationship between institutional collaboration and competency ratings. However, the non-significance of the interaction coefficient does not demonstrate complete independence between the variables; it only indicates that no statistically significant moderation effect was detected within this sample and the specified model.

3.6 Diagnostic and robustness considerations

To account for the heteroskedasticity identified in the study, White HC3 robust standard errors were used. The VIF results indicated that there was no serious multicollinearity problem. At the same time, because the data may be institutionally clustered across the four higher education institutions, it would be appropriate to conduct additional sensitivity analysis using methods appropriate for a small number of clusters.

3.7 Systemic Barriers

Among the systemic problems, the most frequently reported barriers were lack of information about practical needs (47.2%), funding shortages (46.6%), weak institutional

mechanisms for collaboration (33.6%), lack of qualified trainers (20.4%), and bureaucratic barriers (17.9%). These findings suggest that the existing problems concern not only the content of training programs but also the institutional infrastructure of university–government collaboration. Since the reported percentages do not add up to 100%, it is necessary to clarify from the original questionnaire whether respondents were allowed to select multiple response options.

4. Discussion

4.1 Institutional collaboration and competency ratings

H1 was supported: institutional collaboration showed a positive and statistically significant association with competency ratings ($\beta = 0.240$; $p < 0.001$). This finding is consistent with Institutional Theory, which emphasizes the importance of institutional collaboration between higher education institutions and government bodies in personnel training and competency development. However, because of the cross-sectional design of the study, this association cannot be interpreted as a causal effect.

4.2 Stronger association of research utilization with competency ratings

H2 was also supported, and research utilization showed the strongest standardized association in the model ($\beta = 0.389$; $p < 0.001$). This finding is consistent with the knowledge transfer mechanism, suggesting that the application of knowledge and analytical findings generated by higher education institutions in public administration practice may reduce the gap between knowledge developed through education and actual work tasks. At the same time, part of this association may be related to the measurement characteristics, since X4 and Y were assessed by the same respondents. Therefore, the possibility of Common Method Bias cannot be ruled out.

4.3 Civil service personnel training system

H3 was supported ($\beta^* = 0.118$; $p = 0.003$), but the association was considerably weaker than those of X1 and X4. This may indicate that improving the overall quality of the civil service personnel training system is important; however, variables related to specific institutional linkages and knowledge transfer mechanisms showed stronger associations in the model.

4.4 Moderation hypothesis

H4 was not supported: the X1 × X4 interaction term was not statistically significant ($\beta = 0.012$; $p = 0.809$). This result does not support, within this sample, the hypothesis that the combined relationship between institutional collaboration and the use of research findings strengthens the association with competency ratings. At the same time, this finding does not demonstrate that there is no synergy between the two factors; it only indicates that no statistical evidence of such a synergistic interaction was detected.

4.5 Alternative Explanations

The stronger association of research utilization may have at least three alternative explanations. First, consistent with the logic of the knowledge transfer mechanism, the practical application of knowledge may directly strengthen the link between educational content and actual work tasks. Second, the fact that X4 and Y were assessed by the same respondents creates a risk of Common Method Bias. Third, reverse causality is possible: Universities receiving higher competency ratings may also be more likely to have their research findings used by government bodies. The cross-sectional research design does not allow the study to determine which of these alternative explanations is more influential.

4.6 Theoretical Contribution

The main theoretical contribution of the study is its approach of examining university–government collaboration not only as a formal institutional arrangement but

also in relation to knowledge transfer and the use of research findings in practice. The results showed that the practical use of research findings had a stronger association with competency ratings than formal collaboration. This finding suggests that combining Institutional Theory with the knowledge transfer mechanism may provide additional analytical value.

5. Conclusion

This study empirically assessed the relationships between university-government collaboration, the civil service personnel training system, the use of research findings, and competency ratings in the preparation of personnel for the civil service, based on four higher education institutions in Tashkent. The results showed that the use of research findings ($\beta^* = 0.389$), institutional collaboration ($\beta^* = 0.240$), and the civil service personnel training system ($\beta^* = 0.118$) were all statistically significantly and positively associated with competency ratings. The model explained 35.0% of the variation in competency ratings ($R^2 = 0.350$). However, the interaction between institutional collaboration and the use of research findings was not statistically significant ($\beta = 0.012$; $p = 0.809$); therefore, H4 was not supported. Thus, within this sample, no statistically significant interaction effect was detected.

The main issue is that university–government collaboration does not necessarily lead to the translation of knowledge and research findings into practical decisions. The most frequently reported barriers in the study were lack of information about practical needs (47.2%), funding shortages (46.6%), and weak institutional mechanisms for collaboration (33.6%). These findings suggest that the problem is not limited to the content of training programs but also affects the broader chain of "knowledge creation – knowledge transfer – practical application – feedback."

International experience suggests that university–government collaboration should not be limited to formal agreements. For example, in the United Kingdom, the Government Skills system has identified priority research areas to link external research and evidence with the development of civil service capabilities, the design of training programs, and their implementation strategies. This approach aims to strengthen long-term cooperation with the academic community and facilitate the transfer of research findings into civil service practice.

In addition, the UK Policy Profession standards identify collaboration with academia, analysts, and external experts, as well as the collection and assessment of evidence from different sources and the use of research and analytical findings in developing and improving policy decisions, as important competencies for policy professionals.

The OECD also emphasizes the importance of linking education, workplace learning, stakeholder collaboration, and the practical use of research findings in developing the skills required for a high-performing civil service. OECD recommendations note that stronger engagement with academia, collaborative research, and workplace learning opportunities can support the transformation of knowledge into practical skills.

Based on these considerations, for Uzbekistan it may be appropriate to assess university–government collaboration not by the number of "agreements" or activities, but by specific practical outcomes. This could include regularly identifying the competency needs of government bodies, aligning university curricula and practical courses with these needs, conducting applied research commissioned by government bodies, and introducing a common feedback mechanism to assess the extent to which research findings have been used in decision-making processes. It may also be appropriate to expand joint projects for academics and civil servants, short-term

internships, secondment arrangements, and practice-based training using real-world cases. Such an approach would focus not on creating a new system from scratch, but on turning existing forms of collaboration into more results-oriented mechanisms.

The expected outcome of such a mechanism would be the faster integration of government bodies' actual personnel needs into educational programs, greater application of knowledge and skills developed during training in the workplace, increased use of university research in decision-making processes, and, ultimately, improved effectiveness in developing the digital, analytical, strategic, and communication competencies required for the civil service. In the United Kingdom, greater emphasis is also being placed on assessing the impact of education and skills development not only through learning outcomes but also in relation to civil service capability, policy quality, and public service outcomes.

However, these conclusions cannot be interpreted as evidence of causal effects. The cross-sectional design of the study, purposive sampling, the use of data from a single source, and the fact that the Y measure was based on faculty members' perceptions limit the generalizability of the findings and the ability to identify causal mechanisms. Therefore, future research should collect multi-source data from civil servants, higher education institutions, and government bodies; include objective competency indicators; and use longitudinal designs and organization-level outcomes.

Overall, the findings show that the existence of collaboration between higher education institutions and government bodies is not sufficient for preparing personnel for the civil service. What matters is the extent to which the knowledge and research findings generated through this collaboration are effectively used in public administration practice.

The findings therefore suggest that the process of moving from "collaboration to practical value" should be considered a central focus of future reforms and empirical research.

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