The Mediating Effect of Innovation in the Relationship between Intellectual Capital and Institutional Performance

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ABSTRACT

In knowledge-intensive organizations like higher education institutions, the connection between intellectual capital and institutional performance has recently drawn significant academic attention. This study examines whether human, structural, and relational capital individually contribute to better institutional performance through innovation. With a sample of 242 academic staff and structural leaders from public and private universities, the study employed Partial Least Squares Structural Equation Modelling (PLS-SEM) using SmartPLS 4 software. According to the results, innovation is significantly and positively influenced by all three elements of intellectual capital. Furthermore, relational capital and innovation both exert significant direct effects on institutional performance. Innovation fully mediates the relationships between human capital and institutional performance, and between structural capital and institutional performance, while partially mediating the relationship between relational capital and institutional performance. This study concludes that human and structural capital do not significantly improve institutional performance without the intervening role of innovation, whereas relational capital contributes significantly to institutional performance both directly and through innovation. These findings extend the intellectual capital–innovation–performance framework beyond its conventional commercial origins into the higher education context, offering actionable insights for institutional leaders and policymakers seeking to leverage knowledge assets for sustainable performance improvement.

Keywords*: Human Capital, Innovation, Institutional Performance, Relational Capital, Structural Capital.*

INTRODUCTION

Higher Education Institutions (HEIs) have experienced a fundamental transformation in their societal role, shifting from traditional centers of teaching to dynamic agents of knowledge creation, innovation, and socioeconomic development within a knowledge-based economy (Rehman et al., 2024). This shift has intensified institutional competition and increased pressure on universities to demonstrate measurable performance outcomes, including research productivity, accreditation status, and graduate employability. In this evolving landscape, intangible resources, rather than merely financial assets, have become the primary drivers of institutional competitiveness. Universities are required not only to possess such resources but also to manage and leverage them effectively to sustain performance.

East Java represents one of Indonesia's most densely populated regions in terms of higher education institutions, hosting more than 300 universities, including both Public (*Perguruan Tinggi Negeri*/PTN) and Private (*Perguruan Tinggi Swasta*/PTS) institutions across diverse academic disciplines. Despite this abundance, institutional performance across the region remains uneven. Significant disparities exist in accreditation levels, research outputs, and educational quality, which cannot be explained solely by differences

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in financial resources (Muslim, 2025). These inconsistencies indicate that deeper factors, particularly intangible resources such as intellectual capital, play a crucial role in shaping institutional outcomes.

Intellectual Capital (IC) has emerged as a key determinant of organizational performance in knowledge-intensive environments. IC comprises three primary dimensions: human capital, structural capital, and relational capital (Subramaniam & Youndt, 2005). Within the higher education context, human capital refers to faculty expertise and research capabilities; structural capital encompasses governance systems, academic processes, and knowledge infrastructure; and relational capital reflects external collaborations, industry linkages, and alumni networks (Damanik & Rizky, 2025). These components collectively form the foundation through which universities generate value and achieve competitive advantage. Empirical studies support this perspective, although their findings remain inconsistent. For instance, Pedro et al. (2022) found that structural and relational capital significantly enhance institutional performance, while human capital shows a more context-dependent effect. In contrast, Shahbaz et al. (2024) demonstrated that all IC components positively influence performance, with human capital as the most dominant factor. Such variations highlight the need for further investigation, particularly in underexplored contexts like Indonesian higher education.

In addition, prior studies in Indonesia reinforce the importance of intellectual capital in driving organizational outcomes. Gim et al. (2022) and Darban et al. (2022) found that human capital positively influences performance through engagement mechanisms, while Panjaitan and Siahaan (2025) emphasized the role of value-added human capital in improving organizational performance. Azhari and Hasibuan (2023) further revealed that intellectual capital contributes to institutional value when integrated with strategic organizational practices. However, while these studies confirm the relevance of IC, they largely overlook the mechanisms through which intellectual capital is translated into performance outcomes.

Innovation has been identified as a critical mechanism linking intellectual capital to organizational performance. From a knowledge-based perspective, intellectual resources must be activated through innovative processes before generating tangible outcomes. Iqbal et al. (2019) demonstrated that innovation mediates the relationship between IC and HEI performance, suggesting a sequential IC–innovation–performance pathway. In the context of higher education, innovation may take the form of curriculum development, pedagogical transformation, research commercialization, and the introduction of new academic programs. Despite its theoretical importance, empirical studies examining innovation as a mediating variable in Indonesian HEIs remain limited. Most existing research employs alternative mediators, thereby leaving a significant gap in understanding the full mechanism.

Prior studies tend to aggregate data across multiple regions, masking contextual differences such as those in East Java, where institutional diversity ranges from autonomous public universities to smaller private institutions. This heterogeneity suggests that the relationships among intellectual capital, innovation, and institutional performance may operate differently across contexts, yet this nuance remains underexplored. This study examines the role of human capital, structural capital, and relational capital in influencing innovation and institutional performance in East Java's higher education institutions, while also investigating the mediating role of innovation. This research offers three key contributions: extending the intellectual capital framework beyond business and SME contexts into higher education, providing region-specific empirical evidence from Indonesia, and examining innovation as a mediating mechanism for a more nuanced understanding of the IC–performance relationship. Ultimately, this study advances the discourse on intellectual capital by highlighting innovation as a strategic pathway for enhancing institutional performance in knowledge-intensive environments.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

The Effect of Human Capital on Institutional Performance and Innovation

Human capital represents the most fundamental component of intellectual capital, reflecting the knowledge, skills, and competencies embedded in academic staff that drive institutional effectiveness. Grounded in the Resource-Based View (RBV), human capital is considered a strategic asset that satisfies VRIN criteria and contributes directly to organizational performance (Barney, 1991). In higher education institutions, faculty qualifications, research productivity, and pedagogical expertise constitute core manifestations of human capital that shape teaching quality and knowledge creation capacity (Huang & Huang, 2020; Chatterji & Kiran, 2023). Empirical studies by Saqib et al. (2020) and Hinduja et al. (2023) consistently demonstrate that human capital significantly enhances institutional outcomes, including academic performance and knowledge dissemination. Similarly, Pedro et al. (2020) confirm that human capital positively influences institutional effectiveness across multiple stakeholder dimensions.

Beyond its direct effects, human capital plays a critical role in fostering innovation within universities. The ability of academic staff to generate new ideas, redesign curricula, and develop research initiatives reflects the transformation of individual expertise into institutional innovation capacity. This process is essential in knowledge-intensive environments where intellectual contributions form the basis of competitive advantage (Ali et al., 2024).

H1: Human capital has a positive and significant effect on institutional performance.
H2: Human capital has a positive and significant effect on innovation.

The Effect of Innovation on Institutional Performance

Innovation is widely recognized as a central mechanism through which higher education institutions transform intellectual capital into measurable performance outcomes. From a knowledge-based perspective, innovation reflects the process of applying and recombining knowledge resources into new academic programs, pedagogical approaches, and research outputs that enhance institutional relevance and effectiveness (Rehman et al., 2024). Empirical findings by Shahbaz et al. (2024) further support this view, demonstrating that innovation has a significant and positive impact on institutional performance. This influence is evident in improved organizational adaptability, stronger competitiveness, and higher levels of stakeholder satisfaction within higher education institutions.

In higher education settings, innovation extends beyond technological advancement to include curriculum development, pedagogical innovation, and research commercialization. These activities enable universities to adapt effectively to dynamic societal needs and evolving labor market demands, ensuring institutional relevance and competitiveness (Hanifah et al., 2022). Empirical evidence further emphasizes the strategic role of innovation as a central mechanism in higher education performance. Mamilla and Yen (2026) demonstrate that innovation strengthens the relationship between intellectual capital and institutional performance by serving as a mediating pathway. In addition, Shahbaz et al. (2024) confirm that innovation also exerts a direct and significant influence on academic and institutional outcomes.

H3: Innovation has a positive and significant effect on institutional performance.

The Effect of Relational Capital on Institutional Performance and Innovation

Relational capital refers to the value embedded in an institution's external relationships with stakeholders such as industry partners, government agencies, alumni networks, and academic collaborators (Bontis, 1998). In higher education institutions, relational capital plays a crucial role in enhancing access to external knowledge, financial resources, and reputational legitimacy, all of which contribute to improved institutional performance (Al-Tabbaa & Ankrah, 2019; Hassan et al., 2022). Empirical evidence suggests that strong

and well-managed relational networks significantly improve institutional outcomes by increasing external visibility, strengthening collaboration opportunities, and facilitating resource acquisition. These external linkages also enable universities to respond more effectively to environmental changes and stakeholder expectations, thereby reinforcing their overall performance and competitiveness in the higher education landscape.

Relational capital also plays a crucial role in fostering innovation. External collaborations expose universities to diverse knowledge sources and new perspectives, which stimulate creative processes and institutional learning (Wu & Chen, 2021). Zhang et al. (2019) and Zhang et al. (2023) further confirm that inter-organizational networks enhance knowledge recombination and innovation capability. Therefore, relational capital is expected to influence both innovation and institutional performance directly and indirectly.

H4: Relational capital has a positive and significant effect on institutional performance.
H5: Relational capital has a positive and significant effect on innovation

The Effect of Structural Capital on Institutional Performance and Innovation

Structural capital represents the institutionalized knowledge embedded in organizational systems, governance structures, and administrative processes that enable universities to function effectively independent of individuals (Bontis, 1998). In higher education institutions, structural capital includes knowledge management systems, academic governance frameworks, and operational infrastructure that support teaching and research activities (Ibarra-Cisneros et al., 2023). Empirical studies confirm that structural capital significantly contributes to institutional performance by improving efficiency and knowledge flow within organizations (Asiedu et al., 2020).

Structural capital also serves as a key enabler of innovation by providing the organizational foundation necessary for systematic knowledge creation, storage, and application. It ensures that universities have well-established governance systems, knowledge management processes, and administrative structures that support continuous improvement and learning. Zammel and Najar (2024) demonstrate that well-structured organizational systems enhance exploitative innovation by enabling institutions to refine and optimize existing knowledge into improved practices. In addition, Marulanda-Grisales and Vera-Acevedo (2023) emphasize that structural capital consistently exerts a positive influence on institutional effectiveness across higher education contexts. Therefore, structural capital is expected to play an important role in fostering both innovation and institutional performance within universities.

H6: Structural capital has a positive and significant effect on institutional performance.
H7: Structural capital has a positive and significant effect on innovation.

The Effect of Innovation as a Mediator

Innovation functions as a critical mediating mechanism that translates intellectual capital into institutional performance. From a knowledge-based perspective, intellectual capital alone is insufficient to generate performance outcomes unless it is transformed through innovation processes such as curriculum development, pedagogical improvement, and research advancement (Rehman et al., 2024). Empirical studies confirm that innovation mediates the relationship between intellectual capital components and organizational performance (Hanifah et al., 2022).

In higher education institutions, innovation functions as the central mechanism through which human, structural, and relational capital are transformed into measurable institutional outcomes. Human capital contributes intellectual input through faculty expertise and academic competencies, while structural capital provides the necessary organizational systems and processes to support knowledge utilization. Relational capital, in turn, supplies external knowledge flows derived from partnerships and collaborations with various stakeholders. These three dimensions interact and converge through

innovation processes such as curriculum development, research advancement, and pedagogical improvement, ultimately enhancing institutional performance. This mediating role of innovation underscores its importance not merely as an output but as a transformative mechanism linking intellectual capital to institutional effectiveness.

H8: Innovation mediates the effect of human capital on institutional performance.
H9: Innovation mediates the effect of relational capital on institutional performance.
H10: Innovation mediates the effect of structural capital on institutional performance.

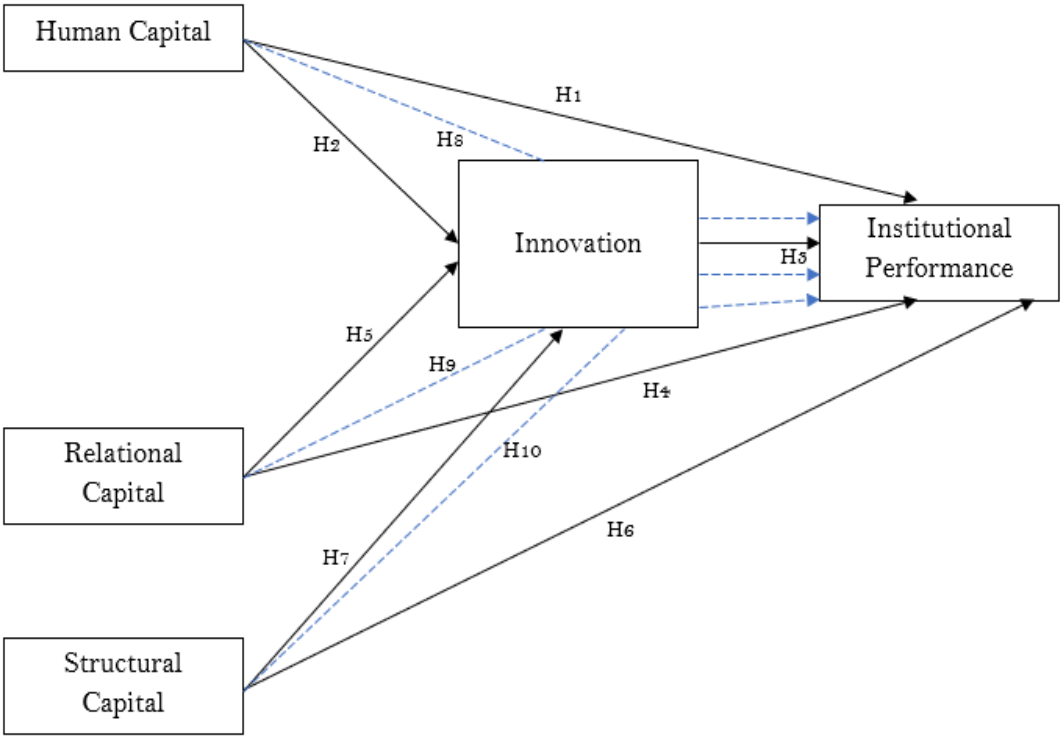

Figure 1. Conceptual Framework

Figure 1 illustrates a conceptual model that examines the influence of three types of intellectual capital, human capital, relational capital, and structural capital, on institutional performance, both directly and indirectly through innovation as a mediating variable. Human capital (H1), relational capital (H4), and structural capital (H6) are assumed to directly influence institutional performance, while they also influence innovation through pathways H2, H5, and H7. Furthermore, innovation plays a role in improving institutional performance (H3). Furthermore, there is a mediating effect where innovation bridges the relationship between human capital (H8), relational capital (H9), and structural capital (H10) on institutional performance, meaning that some of the influence of these three capitals on institutional performance occurs through increased innovation.

RESEARCH METHODS

This study employs a quantitative, cross-sectional survey design to examine the relationships among intellectual capital, innovation, and institutional performance in higher education institutions in East Java, Indonesia. This approach enables systematic hypothesis testing through numerical data collection and statistical analysis, providing objective and replicable results, while the cross-sectional design allows all variables to be measured at a single point in time, consistent with prior intellectual capital studies (Creswell & Creswell, 2017; Maier et al., 2023). The population consists of academic staff and structural leaders, including program heads, faculty deans, and institutional

administrators, who play a central role in managing intellectual capital within universities. Purposive sampling was employed, requiring respondents to have a minimum of three years of professional experience and to occupy either academic or structural positions. Sample size determination followed Hair et al.'s (2019) guidelines for PLS-SEM, recommending a minimum of ten times the largest number of structural paths directed at any latent construct, which yielded a required minimum of 200 respondents. A total of 270 questionnaires were distributed, and 242 valid responses were obtained and used for analysis.

Data were collected using a structured self-administered questionnaire based on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The measurement items were adapted from established and validated instruments in prior literature and adjusted to fit the higher education context. Human capital was measured through indicators such as faculty qualifications, research competence, and pedagogical expertise (Dorozhkin et al., 2016). Structural capital was assessed through governance quality, knowledge management systems, and institutional processes (Bontis, 1998; Rehman et al., 2023). Relational capital was measured based on university–industry partnerships, international collaborations, and alumni network strength (Pedro et al., 2020). Innovation was evaluated through indicators of curriculum innovation, pedagogical innovation, and research innovation, aligned with the Oslo Manual classification (OECD, 2018). Institutional performance was measured using non-financial indicators, including accreditation status, research output, teaching quality, and stakeholder satisfaction, consistent with the Balanced Scorecard framework (Kaplan & Norton, 2005).

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4 software. This method was chosen due to its suitability for analyzing complex models involving latent variables, its robustness in handling non-normal data distributions, and its applicability in exploratory research aimed at extending theoretical frameworks to new contexts. The analysis was carried out in two stages: evaluation of the measurement model and the structural model. The measurement model was assessed for convergent validity, discriminant validity, and construct reliability using indicators such as outer loadings, Average Variance Extracted (AVE), Composite Reliability, and the Fornell-Larcker criterion (Fornell & Larcker, 1981). The structural model was evaluated to test both direct and indirect relationships among variables. A bootstrapping procedure with 5,000 resamples was applied to determine the significance of path coefficients and mediation.

RESULTS

Before presenting the detailed profile of respondents, it is important to provide an overview of the demographic characteristics of the sample used in this study. Understanding respondent composition is essential because it ensures that the data accurately reflect the population under investigation and supports the validity of subsequent statistical analysis. In this study, the respondents consist of academic staff from both state and private higher education institutions in East Java, Indonesia. The demographic information includes gender, age, highest educational qualification, academic position, years of service, and type of institution. These characteristics are relevant as they may influence perceptions and evaluations related to intellectual capital, innovation, and institutional performance. The complete distribution of respondent characteristics is presented in Table 1.

Table 1. Characteristics of the Respondents

Category	Characteristic	Frequency	Percentage (%)
Gender	Male	96	39.67
	Female	146	60.33
Age	< 30 years	34	14.05
	31 – 40 years	80	33.06
	41 – 50 years	100	41.32
	> 50 years	28	11.57
Highest Educational Qualification	Bachelor's Degree (S1)	20	8.26
	Master's Degree (S2)	206	85.12
	Doctoral Degree (S3)	16	6.61
Academic Position	Teaching Assistant *(Asisten Ahli)*	27	11.16
	Lecturer *(Lektor)*	134	55.37
	Senior Lecturer *(Lektor Kepala)*	41	16.94
	Professor *(Guru Besar)*	40	16.53
Years of Service	< 5 years	27	11.16
	5 – 10 years	134	55.37
	11 – 15 years	41	16.94
	> 15 years	40	16.53
Type of Institution	State University *(PTN)*	96	39.67
	Private University *(PTS)*	146	60.33
	Total	242	100

Table 1 presents the demographic profile of the respondents. The findings indicate that the majority of respondents are female (60.33%) and are predominantly in the 41–50 years age group (41.32%). In terms of educational background, most respondents hold a Master's degree (85.12%), reflecting a generally high level of academic qualification. Regarding academic position, the largest proportion consists of lecturers (55.37%), followed by senior lecturers, professors, and teaching assistants. In addition, most respondents have between 5 and 10 years of work experience (55.37%), indicating a relatively experienced academic workforce. Lastly, the sample is composed of both private (60.33%) and state universities (39.67%), ensuring representation from different types of higher education institutions. The demographic distribution suggests that the data are derived from a knowledgeable and experienced group of academic staff.

Table 2. Outer Loading on the Convergent Validity Test

Variable	Indicators	Factor Loading (Test 1)	Factor Loading (Test 2)
Human Capital (HC)	HC1	0.874	0.874
	HC2	0.836	0.836
	HC3	0.800	0.800
Structural Capital (SC)	SC1	0.776	0.776
	SC2	0.835	0.835
	SC3	0.812	0.812
	SC4	0.879	0.879
Relational Capital (RC)	RC1	0.724	0.766
	RC2	0.686	-
	RC3	0.701	0.747
	RC4	0.728	0.768
	RC5	0.693	-
Innovation (I)	I1	0.889	0.890
	I2	0.904	0.903
	I3	0.926	0.926
Institutional Performance (IP)	IP1	0.862	0.862
	IP2	0.862	0.862
	IP3	0.950	0.950
	IP4	0.917	0.917

Table 2 presents the results of the convergent validity test based on outer loading values for each indicator. Most indicators show strong factor loadings above the recommended threshold, indicating adequate convergent validity of the measurement model. The constructs human capital, structural capital, innovation, and institutional performance

consistently exhibit high and stable loading values across both testing stages, reflecting strong indicator reliability. For relational capital, a minor refinement was conducted in the second test, where two indicators were removed due to low loading values, resulting in improved measurement quality. Following this adjustment, the remaining indicators for relational capital meet acceptable validity standards. These findings confirm that all retained indicators are appropriate for measuring their respective latent constructs, thereby supporting the robustness of the measurement model for further structural analysis.

Table 3. Results of CR and AVE

Variable	CR	AVE
Institutional Performance	0.956	0.812
Human Capital	0.875	0.701
Innovation	0.933	0.822
Relational Capital	0.804	0.578
Structural Capital	0.896	0.683

Table 3 presents the results of construct reliability and convergent validity assessment using Composite Reliability (CR) and Average Variance Extracted (AVE). The findings indicate that all variables exceed the recommended thresholds, with CR values above 0.70 and AVE values above 0.50, confirming satisfactory internal consistency and convergent validity. Institutional performance and innovation demonstrate particularly high reliability and validity, reflected in strong CR and AVE values. Human capital and structural capital also show robust measurement quality, indicating that their indicators reliably represent the respective constructs. Meanwhile, relational capital exhibits acceptable but comparatively lower values, though still within the recommended standards. These results confirm that all constructs in this study are reliable and valid for further structural model analysis.

Table 4. Results of Fornell-Larcker

Variable	Institutional Performance	Human Capital	Innovation	Relational Capital	Structural Capital
Institutional Performance	0.901				
Human Capital	0.558	0.837			
Innovation	0.816	0.599	0.907		
Relational Capital	0.616	0.644	0.591	0.760	
Structural Capital	0.607	0.764	0.651	0.736	0.827

Table 4 shows the results of the Fornell-Larcker criterion for discriminant validity. The findings indicate that all diagonal values are higher than the correlations between constructs, confirming that each variable is distinct from the others. This means institutional performance, human capital, innovation, relational capital, and structural capital each measure different concepts and demonstrate adequate discriminant validity. The measurement model satisfies the requirements for discriminant validity and is appropriate for further analysis.

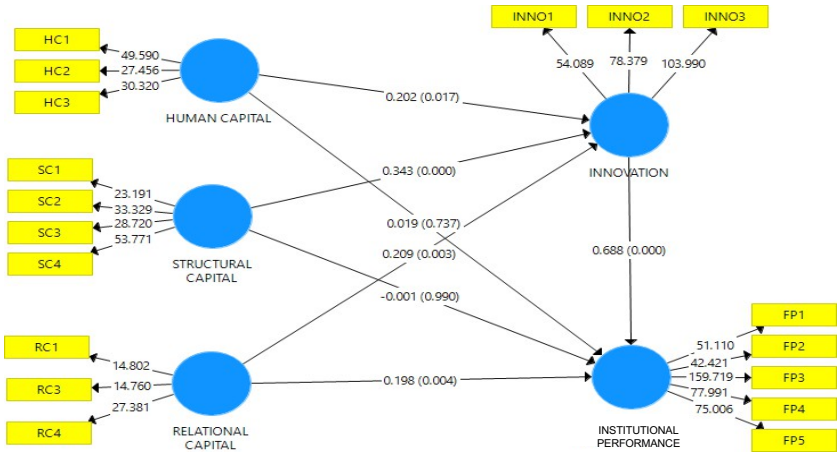

Figure 2. Bootstrapping Results

Table 5. Direct Effect

Hypothesis	Original Sample	Sample Mean	Standard Deviation	t-statistics	p-values
Human Capital -> Institutional Performance	0.019	0.017	0.057	0.336	0.737
Human Capital->Innovation	0.202	0.203	0.084	2.391	0.017
Innovation-> Institutional Performance	0.688	0.691	0.049	14.016	0.000
Relational Capital -> Institutional Performance	0.198	0.198	0.068	2.888	0.004
Relational Capital -> Innovation	0.209	0.212	0.071	2.958	0.003
Structural Capital -> Institutional Performance	-0.001	-0.001	0.071	0.013	0.990
Structural Capital -> Innovation	0.343	0.343	0.085	4.019	0.000

Figure 2 and Table 5 present the results of the structural path analysis examining the relationships among human capital, structural capital, relational capital, innovation, and institutional performance. The findings indicate that human capital does not have a significant direct effect on institutional performance ($\beta = 0.019$; $t = 0.336$; $p = 0.737$), but it has a significant positive effect on innovation ($\beta = 0.202$; $t = 2.391$; $p = 0.017$). Similarly, structural capital shows no significant direct influence on institutional performance ($\beta = -0.001$; $t = 0.013$; $p = 0.990$), yet it significantly affects innovation ($\beta = 0.343$; $t = 4.019$; $p < 0.001$). In contrast, relational capital has a significant positive effect on both innovation ($\beta = 0.209$; $t = 2.958$; $p = 0.003$) and institutional performance ($\beta = 0.198$; $t = 2.888$; $p = 0.004$).

Furthermore, innovation emerges as the strongest predictor of institutional performance ($\beta = 0.688$; $t = 14.016$; $p < 0.001$), indicating a highly significant and dominant effect. These results demonstrate that innovation plays a central mediating role in translating intellectual capital into institutional performance. Human capital and structural capital primarily contribute indirectly through innovation, while relational capital exerts both direct and indirect effects on institutional performance, highlighting the critical role of innovation within the proposed model.

Table 6. Indirect Effect

Hypothesis	Original Sample	Sample Mean	Standard Deviation	t-statistics	p-values
Human Capital -> Innovation -> Institutional Performance	0.139	0.141	0.061	2.267	0.023
Relational Capital -> Innovation ->Institutional Performance	0.144	0.146	0.050	2.901	0.004
Structural Capital -> Innovation -> Institutional Performance	0.236	0.237	0.061	3.878	0.000

Table 6 presents the results of the indirect effect analysis through innovation as a mediating variable. The findings show that human capital has a significant indirect effect on institutional performance through innovation ($\beta = 0.139$; $t = 2.267$; $p = 0.023$). Similarly, relational capital also demonstrates a significant indirect effect on institutional performance via innovation ($\beta = 0.144$; $t = 2.901$; $p = 0.004$). In addition, structural capital exhibits the strongest indirect effect among the variables ($\beta = 0.236$; $t = 3.878$; $p < 0.001$), indicating its substantial contribution to institutional performance when mediated by innovation. These results confirm that innovation plays a crucial mediating role in the relationship between intellectual capital components and institutional performance. While the direct effects of some variables are limited, their influence becomes more substantial through innovation, highlighting its importance as a key mechanism in enhancing institutional outcomes.

DISCUSSION

The findings of this study indicate a differentiated pattern of relationships between intellectual capital dimensions and institutional performance in higher education institutions in East Java. Human capital and structural capital do not exhibit a significant direct effect on institutional performance, whereas relational capital shows a positive and significant influence. This suggests that academic staff competencies, qualifications, and institutional systems are not sufficient to directly enhance performance outcomes. This result is noteworthy as it contrasts with earlier studies emphasizing human capital as a primary driver of organizational performance in higher education contexts (Fariz, 2019). However, it aligns with Pedro et al. (2022), who argue that the contribution of human capital is often context-dependent and may operate indirectly through mediating mechanisms such as innovation.

The non-significant effect of structural capital further indicates that governance systems, knowledge management structures, and organizational infrastructure have not yet fully translated into direct performance improvements. This condition may reflect variations in institutional maturity across universities in East Java. Fariz and Winarsih (2024) emphasize that knowledge management and information technology capabilities can enhance institutional competitiveness; however, their effectiveness depends on consistent and mature implementation. In contrast, Rehman et al. (2024) found structural capital to be a significant predictor of institutional performance in other contexts, suggesting that this relationship is highly context-sensitive.

Relational capital, however, emerges as the only intellectual capital dimension with a significant direct effect on institutional performance. This finding highlights the strategic importance of external relationships such as industry partnerships, alumni networks, and international collaborations in enhancing institutional outcomes. This is consistent with Pedro et al. (2020) and Fariz (2022), who emphasize that relational capital plays a dominant role in improving institutional performance by providing access to resources, legitimacy, and collaborative opportunities.

Furthermore, innovation demonstrates a strong and significant influence on institutional performance. This finding supports Rehman et al. (2024) and Winarsih and Fariz (2025), who highlight innovation as a key determinant of performance in higher education institutions. From a Resource-Based View perspective, innovation functions as a transformation mechanism that converts intellectual capital into tangible institutional outcomes such as curriculum development, teaching innovation, and research output.

The mediation analysis confirms that innovation serves as a critical mechanism linking human capital and structural capital to institutional performance. These two dimensions do not directly influence performance but instead operate through innovation as an intervening process. This finding reinforces Rehman et al. (2024), who argue that innovation is a key pathway through which knowledge resources are transformed into performance outcomes. Meanwhile, relational capital exhibits partial mediation, indicating both direct and indirect effects through innovation. This is consistent with Fariz (2022), who suggests that external relationships not only enhance institutional reputation

but also stimulate innovation processes. The results confirm that innovation is the central mechanism connecting intellectual capital to institutional performance. Therefore, strengthening innovation capacity is essential for higher education institutions to effectively leverage human capital, structural capital, and relational capital in achieving sustainable performance improvements.

CONCLUSION

This study concludes that intellectual capital contributes to institutional performance in higher education institutions in East Java through differentiated mechanisms across its dimensions. The findings indicate that relational capital is the only dimension with a direct and significant effect on institutional performance, highlighting the critical role of external networks such as industry partnerships, international academic collaborations, alumni relations, and institutional reputation in enhancing university performance. In contrast, human capital and structural capital do not demonstrate significant direct effects; however, both contribute indirectly through innovation as a mediating variable. This suggests that academic staff competencies and institutional systems do not automatically translate into performance outcomes unless they are effectively transformed through innovation processes such as curriculum development, pedagogical improvement, and research advancement. Relational capital also exerts an indirect effect through innovation, indicating its dual role as both a direct performance driver and an innovation enabler.

In terms of implications, the findings emphasize that improving higher education institutional performance cannot rely solely on strengthening human resources and organizational systems but must also prioritize innovation capacity as the primary mechanism for converting intellectual capital into tangible outcomes. University managers should integrate human capital development and structural improvements with structured innovation initiatives while simultaneously strengthening external partnerships as a strategic asset. This study is limited by its cross-sectional design, which restricts causal inference over time, and by its geographical focus on East Java, which limits the generalizability of the findings. Future research is recommended to employ longitudinal designs, expand the geographical scope to other regions, and incorporate moderating variables such as institutional leadership, accreditation level, or digital transformation capability to provide a more comprehensive understanding of the relationships among these constructs.

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