

The Role of Intellectual Capital in Improving Employee Performance through Employee Engagement in the Hybrid Work Era

*Intellectual Capital in
Improving Employee
Performance*

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ABSTRACT

This research is motivated by changes in the post-pandemic work system that have encouraged the implementation of hybrid work in the education sector, requiring organizations to optimally manage intellectual capital while maintaining employee engagement to improve performance. This study aims to analyze the effect of intellectual capital on employee performance, with employee engagement as a mediating variable, in the education industry in North Kalimantan. The research method used a quantitative approach with a survey technique of lecturers and education staff at several universities in North Kalimantan. Data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM). The results show that intellectual capital has a positive and significant effect on employee performance. Employee engagement has also been shown to have a positive and significant effect on employee performance. In addition, employee engagement significantly mediates the relationship between intellectual capital and employee performance. These findings confirm that intellectual capital development will have a stronger impact on performance when supported by a high level of employee engagement. This study concludes that integrating intellectual capital management strategies and increasing employee engagement are key to improving performance in the hybrid work era in the education sector.

Keywords: *Employee Engagement, Employee Performance, Hybrid Work, Human Resource Management, Intellectual Capital.*

INTRODUCTION

The transformation of the world of work driven by the digital revolution and the COVID-19 pandemic has accelerated the adoption of hybrid work systems, which combine remote and face-to-face arrangements. In the context of educational organizations in North Kalimantan, the hybrid work model presents unique challenges, as most institutions have traditionally relied heavily on direct interaction in conducting managerial and academic activities. This condition demands adaptive human resource management to sustain employee performance. Previous studies emphasize that organizational success in navigating the hybrid work era is largely influenced by the ability to manage intangible assets, particularly intellectual capital (Afiah et al., 2022).

Intellectual capital is viewed as a strategic resource that can enhance organizational competitiveness. Afifah et al. (2023) and Jasiyah et al. (2025) define it as knowledge, experience, and competencies that can be leveraged to create added value. In the

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education industry, intellectual capital includes teaching competencies, learning systems, and collaborative networks with external stakeholders. Nguyen et al. (2022) highlight that intellectual capital significantly influences innovation and organizational performance. This underscores the importance of research in the education sector of North Kalimantan, particularly given the scarcity of related studies in border regions.

However, intellectual capital alone does not automatically enhance performance without the presence of employee engagement. In this study, employee engagement is positioned as a critical mediating factor. Schaufeli and Bakker (2004) define employee engagement as a positive psychological state characterized by vigor, dedication, and absorption. Engaged employees tend to be more productive, innovative, and loyal. Nasution and Sibuea (2025) further demonstrate that employee engagement acts as a key mediator linking organizational factors to employee performance. The hybrid work context presents significant challenges in maintaining engagement, as reduced face-to-face interaction may result in feelings of isolation, lower motivation, and diminished collaboration, potentially leading to decreased performance. Soomro et al. (2023) argue that while hybrid systems increase flexibility, they also create risks of disengagement if not managed effectively. This highlights the growing relevance of examining employee engagement as a mediator in the relationship between intellectual capital and performance.

Employee performance in the education sector is not only measured by administrative efficiency but also by the quality of educational services, innovation in teaching methods, and contributions to institutional reputation. Armstrong and Taylor (2020) emphasize that performance reflects the effectiveness of human resource management through competency development and cultural reinforcement. Within this framework, intellectual capital serves as the foundation, while employee engagement drives the actualization of performance. Although prior studies have extensively examined the relationship between intellectual capital, employee engagement, and performance in business and banking sectors (Bontis, 1998; Jirakraisiri et al., 2022), such research remains limited in education, especially in border areas such as North Kalimantan. The education sector plays a vital role in building human resource capacity in these regions. Hence, this study seeks to provide empirical contributions while enriching the literature on human resource management in the hybrid work context.

Beyond academic significance, this research also addresses urgent practical concerns. Educational institutions in North Kalimantan face resource constraints, including limited funding, technology, and access to professional training. By optimizing existing intellectual capital and enhancing employee engagement, organizations can strengthen their competitiveness without relying solely on physical resources. This aligns with Rahman et al. (2021), who stress the importance of knowledge-based strategies for improving organizational performance. The study adopts a quantitative approach, emphasizing the mediating role of employee engagement. The proposed research model is grounded in the Knowledge-Based View (KBV), which posits that knowledge is the organization's most critical asset (Grant, 1996). Accordingly, intellectual capital is regarded as a determinant factor, while engagement serves as the psychological mechanism that channels its influence into performance outcomes.

Theoretically, this study broadens the understanding of the mediating role of employee engagement in the relationship between intellectual capital and performance, particularly in the context of hybrid work. Practically, this study offers strategic recommendations for human resource management in educational institutions in North Kalimantan. Therefore, this study examines how intellectual capital can improve employee performance through the mediating role of employee engagement in the hybrid work era, and it also provides a basis for developing a relevant research model for educational organizations in border regions.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

The Effect of Intellectual Capital on Employee Performance

Employee performance reflects work outcomes aligned with organizational standards, including productivity, quality, efficiency, and innovation (Armstrong & Taylor, 2020). In education, it covers teaching, research, and service. It is shaped by competence, motivation, leadership, and systems, including digital adaptability (Etikan et al., 2016; Anwar & Abdullah, 2021). The concept of intellectual capital has become a central theme in modern strategic management, particularly as organizations increasingly rely on intangible resources to achieve sustainable competitive advantage. Unlike physical assets, intellectual capital is embedded in knowledge, skills, systems, and relationships that enable organizations to adapt and grow in dynamic environments. Angreni and Mahyuni (2024) conceptualized intellectual capital as a multidimensional construct consisting of human capital, structural capital, and relational capital. Human capital refers to the collective competencies, experience, creativity, and problem-solving abilities possessed by employees, which serve as the primary drivers of value creation. In knowledge-intensive sectors, such as education, human capital is especially critical because organizational performance is highly dependent on the quality and expertise of academic and administrative staff.

Beyond individual capabilities, intellectual capital is also supported by organizational infrastructure and external relationships. Structural capital encompasses organizational processes, routines, culture, information systems, and knowledge management mechanisms that enable employees to effectively utilize their competencies. Strong structural capital ensures that knowledge is retained within the organization and can be continuously developed and shared. Relational capital, on the other hand, reflects the quality of relationships with external stakeholders, including students, partners, communities, and other institutions, as well as organizational reputation and trust. Empirical studies by Bontis (1998) and Kianto et al. (2017) provide strong evidence that intellectual capital significantly contributes to innovation, organizational effectiveness, and employee performance. These findings suggest that intellectual capital not only enhances competitive positioning but also creates an enabling environment in which employees can perform optimally and contribute to long-term organizational success.

H1: Intellectual capital has a positive and significant effect on employee performance.

The Effect of Employee Engagement

Employee engagement refers to an employee's emotional, cognitive, and behavioral attachment to their work, reflecting the extent to which individuals invest their full selves in their job roles (Schaufeli & Bakker, 2004). This construct is commonly conceptualized through three core dimensions: vigor, dedication, and absorption. Vigor represents high levels of energy, mental resilience, and persistence in the face of difficulties. Dedication is characterized by a strong sense of enthusiasm, inspiration, significance, and pride toward one's work, while absorption describes a state of deep concentration and immersion in work activities, where time passes quickly, and detachment becomes difficult. Together, these dimensions illustrate that engagement is not merely an attitudinal state but a holistic condition encompassing motivation, emotion, and behavior in the workplace. In organizational settings, particularly those undergoing structural and technological change, employee engagement plays a crucial role in sustaining performance and well-being.

Previous studies highlight that employee engagement does not emerge in isolation but is shaped by various organizational factors. Saks (2006) argues that engagement is strongly influenced by managerial support, leadership quality, and a supportive workplace culture that fosters trust and recognition. When employees perceive that their organization values their contributions and supports their development, they are more likely to exhibit higher levels of engagement. Engaged employees tend to demonstrate greater loyalty, enhanced productivity, stronger commitment to organizational goals, and

a willingness to go beyond formal job requirements. More recent empirical evidence provided by Alfes et al. (2013) further confirms that employee engagement serves as a critical mediating mechanism linking organizational resources to both individual and team performance. This finding underscores the strategic importance of engagement in translating intangible organizational assets into tangible performance outcomes.

H2: Employee engagement has a positive and significant effect on employee performance.
H3: Employee engagement mediates the relationship between intellectual capital and employee performance.

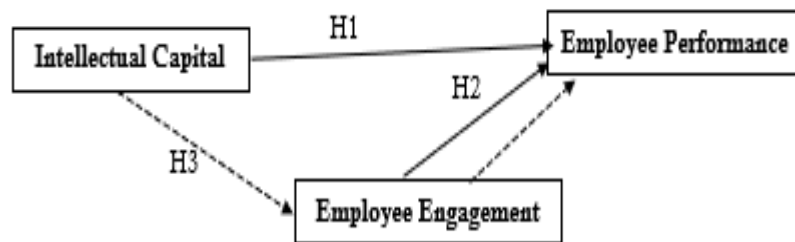


Figure 1. Research Framework

Figure 1 shows the relationship between intellectual capital, employee engagement, and employee performance. The first hypothesis examines the direct effect of intellectual capital on employee performance, indicating that higher intellectual capital is associated with better employee performance. The second hypothesis assesses the effect of employee engagement on employee performance, indicating that employee involvement, motivation, and commitment influence performance. The third hypothesis explores the mediating role of employee engagement between intellectual capital and employee performance, where intellectual capital increases employee engagement, which in turn improves performance.

RESEARCH METHODS

This study employed a quantitative approach with an explanatory survey method. The quantitative approach was chosen as it enables the testing of causal relationships between variables through objective statistical analysis (Creswell & Creswell, 2018). The explanatory survey design is appropriate since the purpose of this research is to analyze the effect of intellectual capital on employee performance with employee engagement as a mediating variable. This design also allows the testing of a complex structural model, which is consistent with the Knowledge-Based View (KBV) framework (Grant, 1996).

The population of this study consisted of educators and administrative staff at educational institutions in North Kalimantan, including universities. Respondents were selected based on the criteria of having worked for at least one year, being involved in a hybrid work system that combines online and offline activities, and having a direct role in supporting the performance of educational organizations. The sampling technique used was purposive sampling to ensure respondents were suitable for the research context. The sample size determination refers to Hair et al. (2019) in SEM-PLS analysis, which is a minimum of ten times the number of measurement indicators, resulting in an estimated feasible sample size ranging from 150 to 250 respondents.

The research instrument was a questionnaire using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Intellectual capital was measured through three dimensions: human capital, structural capital, and relational capital (Bontis, 1998; Kianto et al., 2017). Employee engagement was measured based on vigor, dedication, and absorption in line with the model of Schaufeli and Bakker (2004). Employee performance was assessed using indicators of effectiveness, efficiency, quality, and organizational contribution. These instruments have been widely applied in international research, ensuring their construct validity.

Data analysis was conducted using Structural Equation Modeling with a Partial Least Squares (SEM-PLS) approach through SmartPLS software. This method was chosen because it can test causal relationships between latent variables using a relatively small sample size and data that are not necessarily normally distributed (Hair et al., 2019). The analysis process included evaluating the measurement model (outer model) to assess convergent and discriminant validity and reliability, and evaluating the structural model (inner model) to test the significance of relationships among variables and the mediating role of employee engagement. Mediation analysis was conducted using a bootstrapping approach to ensure robust and reliable estimation results (Preacher & Hayes, 2008).

This study also adhered to ethical research principles by ensuring the confidentiality of respondents' data, voluntary participation, and the absence of coercion in survey completion. Respondents provided informed consent before completing the questionnaire. Collected data were used solely for academic purposes in accordance with international research standards. These practices align with the ethical research guidelines proposed by Bryman & Bell (2015) for management studies.

RESULTS

This study involved 210 respondents from various higher education institutions in North Kalimantan, consisting of lecturers, educational staff, and administrative personnel. The respondent composition shows that lecturers accounted for 58% of respondents, followed by educational staff at 27% and administrative personnel at 15%. This distribution reflects the typical human resource structure in higher education institutions, where lecturers play a central role in academic activities, while educational and administrative staff provide essential support for institutional operations and governance. In terms of age, the majority of respondents were within the productive age range of 25–40 years, representing 65% of the sample. This indicates that most respondents are in an active career stage and are likely involved in professional development and performance improvement. All respondents held at least a bachelor's degree (S1), suggesting an adequate educational background to understand and respond to issues related to intellectual capital, employee engagement, and performance. Thus, the diversity of respondent characteristics is considered sufficiently representative of human resource conditions in the education sector of a border region such as North Kalimantan. These findings are consistent with previous studies indicating that diverse respondent backgrounds contribute to varying perceptions in assessing intellectual capital and employee engagement (Kianto et al., 2017).

Validity and reliability tests were conducted to ensure that the measurement instruments used in this study were able to measure the constructs accurately and consistently. The test results showed that all indicators had outer loading values above 0.70, indicating that convergent validity criteria were met. Furthermore, the Average Variance Extracted (AVE) values for each construct were also above the threshold of 0.50, indicating that each construct adequately explained the variance in its indicators. In terms of reliability, the Composite Reliability (CR) values for all constructs ranged from 0.90 to 0.94. This value indicates an excellent level of internal consistency and confirms that the indicators used can measure the constructs stably. Thus, the results of the validity and reliability tests confirm that the research instrument has adequate measurement quality and meets the criteria recommended by Hair et al. (2019). Therefore, the instrument used was deemed feasible and can be further tested for the structural model (inner model) to analyze the relationships between variables in this study.

Table 1. AVE and Composite Reliability

Variable	AVE	Composite Reliability
Employee Performance (EP)	0.763	0.928
Employee Engagement (EE)	0.719	0.947
Intellectual Capital (IC)	0.709	0.945

The results presented in Table 1 demonstrate that all constructs in the model meet the recommended criteria for convergent validity and internal consistency reliability. The AVE values for employee performance (0.763), employee engagement (0.719), and intellectual capital (0.709) all exceed the minimum threshold of 0.50, indicating that each construct explains more than half of the variance in its indicators. This confirms that the indicators used adequately represent their respective latent variables.

In terms of reliability, composite reliability values range from 0.928 to 0.947 for the main constructs, which are well above the recommended cutoff of 0.70. These results indicate a high level of internal consistency among the measurement items. In addition, the mediating effect IN–EE–EP shows AVE and composite reliability values of 1.000, reflecting that the indirect effect is estimated as a single, perfectly reliable construct within the PLS-SEM framework. Thus, these findings confirm that the measurement model demonstrates satisfactory validity and reliability, allowing the analysis to proceed to the evaluation of the structural model and hypothesis testing.

The R-square value, which measures the extent to which independent variables influence dependent variables and path coefficients, provides important insights into structural models (Hair et al., 2019). In this study, R-square values were categorized into three levels: strong (0.67), moderate (0.33), and weak (0.19) (Chin, 1998). By focusing on the significance level of the p-value, it can be determined whether a hypothesis is supported or not. Results obtained through the bootstrapping method are used to estimate measurement parameters and standard errors based on empirical data, not based on statistical assumptions. In this study, a hypothesis is declared supported if the significance level shows a p-value below 0.05. Conversely, if the significance level shows a p-value above 0.05, the hypothesis is declared unsupported.

Table 2. Structural Analysis Result

Hypothesis	Original Sample	t-statistic	p-value	Decision
Intellectual Capital → Employee Performance	0.109	2.567	0.011	Supported
Employee Engagement → Employee Performance	0.629	9.091	0.000	Supported
Intellectual Capital → Employee Engagement → Employee Performance	0.199	3.861	0.000	Supported

Table 2 presents the results of hypothesis testing based on Structural Equation Modeling–Partial Least Squares (SEM-PLS) analysis. The test was conducted by examining the original sample values (path coefficients), t-statistics, and p-values to determine the significance of the relationships between variables. The results of H1 indicate that intellectual capital has a positive and significant effect on employee performance, with a path coefficient of 0.109, a t-statistic of 2.567, and a p-value of 0.011. A p-value of less than 0.05 supports the first hypothesis, suggesting that increasing intellectual capital directly improves employee performance.

Furthermore, H2 indicates that employee engagement has a positive and significant effect on employee performance, with a coefficient of 0.629, a t-statistic of 9.091, and a p-value of 0.000. These findings confirm that employee engagement is a powerful factor in improving employee performance. Testing H3 shows that employee engagement significantly mediates the relationship between intellectual capital and employee performance, with a coefficient of 0.199, a t-statistic of 3.861, and a p-value of 0.000. This indicates that intellectual capital not only influences performance directly, but also indirectly through increased employee engagement.

DISCUSSION

The findings of this study demonstrate that intellectual capital plays a significant role in improving employee performance within educational organizations operating under hybrid work arrangements. Intellectual capital, which includes human capital, structural

capital, and relational capital, represents a critical intangible resource that supports organizational effectiveness and long-term competitiveness (Buenechea-Elberdin, 2017; Bontis et al., 2018). In the context of education, intellectual capital enables institutions to strengthen employees' competencies, improve internal processes, and build productive relationships with stakeholders. These capabilities are increasingly important as educational organizations adapt to flexible work systems and digital transformation (Mention & Bontis, 2013; Inkinen, 2015).

The results further indicate that employee engagement has a strong and positive influence on employee performance. Engagement reflects employees' emotional and psychological attachment to their work, characterized by dedication, enthusiasm, and active involvement in work-related tasks (Shuck et al., 2017; Saks, 2019). In hybrid work environments, where direct supervision and face-to-face interaction are limited, engagement becomes a crucial factor in maintaining productivity and work quality. Engaged employees are more likely to remain committed, demonstrate initiative, and contribute creatively to both academic and administrative activities (Kahn, 1990; Bailey et al., 2017). This finding highlights the importance of creating work environments that foster trust, support, and meaningful participation.

This study confirms that employee engagement serves as a mediating mechanism in the relationship between intellectual capital and employee performance. Intellectual capital alone does not automatically translate into improved performance unless employees are actively engaged in utilizing the knowledge, skills, and organizational resources available to them (Hsu & Sabherwal, 2012; Alfiero et al., 2019). Engagement acts as a psychological bridge that allows intellectual capital to be transformed into productive behavior and tangible performance outcomes. When engagement levels are high, employees are more motivated to apply their competencies, collaborate effectively, and leverage organizational knowledge in ways that enhance performance (Orgambidez et al., 2019; Bednarska-Wnuk, 2021).

From a practical perspective, these findings emphasize the importance of integrated human resource management strategies that simultaneously focus on intellectual capital development and employee engagement. Educational institutions in North Kalimantan, particularly those located in border regions, often face limitations in financial and physical resources. In such contexts, optimizing intangible assets becomes a strategic necessity rather than a choice (Kamukama, 2013; Al-dmour et al., 2020). By investing in employee development, knowledge-sharing systems, and supportive leadership practices, institutions can strengthen engagement and maximize the impact of their intellectual capital.

These results are consistent with the broader challenges associated with hybrid work in the post-pandemic era. Educational employees are required to master digital tools, collaborate across virtual platforms, and maintain high levels of performance despite reduced physical interaction (Carnevale & Hatak, 2020; Wang et al., 2021). Therefore, organizations must adopt strategies that align intellectual capital management with engagement-enhancing practices to ensure sustainable performance over time (Subramaniam & Youndt, 2005; Kianto et al., 2017). The interaction between intellectual capital and employee engagement reflects a synergistic process in which organizational knowledge and employee motivation mutually reinforce each other. This finding supports recent studies that highlight the mediating of psychological constructs in translating intangible resources into performance outcomes (Garg & Dhar, 2017; Alrowwad et al., 2020).

Thus, this study reinforces the KBV by demonstrating that sustainable performance in educational organizations is not solely determined by the availability of intellectual capital, but also by the extent to which employees are engaged in utilizing these resources. In hybrid work settings, where flexibility and digitalization redefine traditional work practices, employee engagement becomes a key driver in converting intellectual capital into meaningful performance outcomes (Del Giudice et al., 2021; Serenko, 2022).

CONCLUSION

This study concludes that intellectual capital plays an important role in improving employee performance in the education sector of North Kalimantan, both directly and through the mediating role of employee engagement in a hybrid work context. The findings indicate that effective management of human capital, structural capital, and relational capital provides a strong foundation for performance improvement, particularly when employees demonstrate a high level of engagement with their work and organization. Employee engagement functions as a key mechanism that strengthens the impact of intellectual capital on employee performance.

From a theoretical perspective, this study contributes to the human resource management literature by extending the understanding of employee engagement as a mediating variable in the relationship between intellectual capital and employee performance, especially within educational institutions located in border regions. Practically, the findings offer useful insights for educational managers and policymakers in designing human resource strategies that integrate intellectual capital development with engagement-oriented practices to support sustainable performance in hybrid work environments.

Despite its contributions, this study has several limitations. The research adopts a quantitative and cross-sectional design and focuses only on the education sector in one specific region, which may limit the generalizability of the results. Therefore, future research is recommended to apply longitudinal designs, involve different sectors and regions, and include additional variables such as digital leadership, organizational culture, or technological readiness. Further studies may also explore the moderating role of contextual factors to provide a more comprehensive understanding of employee performance dynamics in the hybrid work era.

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