JIA (Jurnal Ilmiah Akuntansi) • 9 (2), 478-496 • 2024

The Role of Intellectual Capital and Core Competencies in Building Competitive Advantage in Higher Education

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CITATION:
Hartanti, I. Y., Irawan, D., & Juanda, A. (2024). The role of intellectual capital and core competencies in building competitive advantage in higher education. *JIA (Jurnal Ilmiah Akuntansi)*, 9(2), 478-496.

ARTICLE HISTORY:
Received:
July 1st, 2024
Accepted:
December 19th, 2024
Published Online:
December 20th, 2024

DOI: 10.23887/jia.v9i2.81827

Abstract

This study examines the relationship between intellectual capital, core competencies, and competitive advantage within higher education institutions in Indonesia. These institutions are pivotal in adapting to globalization and enhancing educational competitiveness. Despite existing research, there remains a gap in understanding how these elements interact dynamically within the Indonesian context, particularly how intellectual capital directly and indirectly influences competitive advantage through core competencies. Our population includes all universities listed in the 2023 Webometrics world university rankings, focusing on lecturers involved in planning and administrative tasks. A simple random sampling method was employed to select the sample. Data were collected using self-administered questionnaires and analyzed through Structural Equation Modeling (SEM) via Partial Least Square (PLS) 3.0 software. The findings reveal that intellectual capital significantly influences competitive advantage, mediated by core competencies unique to Indonesian higher education. This research offers insights for stakeholders, including education managers, policymakers, and academics, to develop strategies that enhance competitive positioning by optimizing intellectual capital and evolving core competencies aligned with industry needs and societal demands in the digital era. This study fills the identified research gap by providing empirical evidence and strategic insights into the interplay of these critical factors.

Keywords: higher education institutions; intellectual capital; competitive advantage; core competencies.

INTRODUCTION

Higher education institutions in Indonesia play a crucial role in developing the next generation, preparing them to keep up with the increasingly competitive pace of

globalization (Gligović, Vukasović, & Ateljević, 2021). A significant issue is that the globalization of education has intensified competition among higher education institutions worldwide (Haan, 2015). In this competitive era, higher education institutions face numerous internal and external challenges. Therefore, competitive advantage in the higher education sector refers to an institution's ability to outperform competitors by operating in ways that others cannot, thus creating more value (Agyabeng-Mensah, Ahenkorah, Afum, & Owusu, 2020; Pedro, Alves, & Leitão, 2020).

Competitive advantage is driven by the institution's ability to sustain future operations and lies at the core of any institution's performance. Educational institutions play an indirect role in creating a more effective competitive advantage as it is primarily internal and shows a causal relationship (Vasiliev, 2022). According to Kassar & Al-Saqal (2022), arious factors such as intellectual models, resource advantages, and dynamic capabilities contribute to competitive advantage. Studies emphasize the importance of strategic foresight in achieving competitive advantage, which plays a critical role in shaping the performance and success of universities and requires a strategic approach to resource utilization and capability development (Fang & Li, 2017).

The creation of a core competency involves leveraging potential to create value distinct from other institutions (Mahdi, Nassar, & Almsafirc, 2021). Core competence, which includes the management of research projects, interdepartmental initiatives, rewards for human resources, and the quality of lecturers and curriculum, is key to creating competitive advantage and is difficult for competitors to imitate (Williams, 2001; Muneeb, Khong, Ennew, & Avvari, 2020). Kumar (2020) and Gao (2023) further state that universities that focus on developing core competencies can produce professionally competitive graduates. A well-designed curriculum that develops these competencies can lead to long-term benefits, attracting talented students and building a strong national and international reputation.

Intellectual capital (IC), consisting of human, relational, and structural capital, supports competitive advantage in higher education (Paduano et al., 2017). Known as intangible assets in Indonesia, IC includes non-monetary assets that offer economic benefits in the future (Hadiyanto, 2010; Na &

Kang, 2018). IC, which encompasses "knowledge," plays a crucial role in fostering competitive advantage and has been adopted by public and nonprofit organizations like universities (Levina, 2019; Mouritsen, Thorbjørnsen, Bukh, & Johansen, 2004). Recent trends such as digitalization have furthered the use of IC to improve learning effectiveness (Al Kodri, 2022).

Despite existing studies, gaps remain in how intellectual capital, core competencies, and competitive advantage interact within the Indonesian higher education context. This research seeks to explore these dynamics comprehensively, aiming to optimize the utilization of intellectual capital and core competencies for sustainable competitive advantage. The findings are expected to guide stakeholders in strengthening competitive positions, influencing curriculum design, and contributing to the development of a knowledge-based economy at the national level.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Resource-Based View (RBV) Theory

The Resource-Based View (RBV) theory plays an important role in enhancing competitive advantage across various sectors. RBV emphasizes strategic mapping of resources, capabilities, and public value in healthcare organizations to achieve competitive advantage (Kosiol, Fraser, Fitzgerald, & Radford, 2023). Colleges and universities have also adopted RBV to increase their competitive edge under the increasingly competitive conditions of education (Salsabila, 2022). RBV underscores the importance of unique and inimitable internal resources as the main sources of competitive advantage. In the context of higher education, these resources may include academic reputation, quality of lecturers, physical and technological infrastructure, and a strong alumni network. Lubis (2022) stated that RBV could increase competitive advantage by utilizing internal resources, capabilities, and unique assets to create strategic advantages, thus fostering high competitiveness and innovation within institutions. According to Poazi, Tamunosiki-Amadi, & Fems (2017), RBV theory highlights the leverage of unique resources for competitive advantage, leading to organizational innovation and sustainable growth, which ultimately contribute to competitive advantage in organizations.

Intellectual Capital (IC)

IC is the space where institutional knowledge resides and consists of a set of intangible assets such as skills, brand, service quality, quality of human resources, software, the quantity and quality of information processed, access to credit, alliance formation, dialogue capacity, trust, and organizational reputation (Tefera, 2020). Thus, monitoring IC becomes an excellent alternative to measure and control intangibles in higher education institutions (HEIs) (Pedro, Alves, & Leitão, 2022).

In the knowledge economy, Higher Education IC plays a fundamental role as it is considered a relevant factor in value creation and competitive advantage (Kumar, 2020). IC in HEIs can be defined as a combination of knowledge-related resources, idea wealth, capabilities, and infrastructure that determine an organization's competitiveness (Iqbal, Latif, Marimon, Sahibzada, & Hussain, 2018). Higher education should analyze, report, and invest to strengthen IC, taking into account that IC accumulates, becomes obsolete, and needs updating (Levina, 2019). IC in higher education consists of three categories: Human Capital, Structural Capital, and Relational Capital (Secundo, Perez, Martinaitis, Leitner, & Change, 2017)

Core Competencies

Core competencies are a fundamental part of the knowledge creation system and are difficult for competitors to replicate (Na & Kang, 2018). They result from a selection process both inside and outside the organization and are key to creating competitive advantage. However, organizations must assess the maturity level of their core competencies to effectively respond to dynamic environmental changes. The development of products and services based on core competencies shapes the organization's value proposition and aligns with each target market and business strategy (Zhao, Zhang, & Wang, 2020).

In higher education institutions, it is crucial to identify which resources contribute to core competencies and ensure their market survival. These resources include organizational knowledge evaluation, research, identity, technology management, financial support, and human resources, as well as rewards (Muneeb et al., 2020). Notably, there are differences between public and private universities. In Indonesia, the educational context and government intervention in resource allocation

significantly impact the performance, value creation, and consolidation of core competencies in higher education institutions (HEIs) (Fu, See, & Policy, 2022).

Core competencies also entail responsibilities that help strengthen and enhance other competencies. Furthermore, interdepartmental initiatives promote collaborative work to advance the research process and improve the skills of universities in terms of human resources (Kumar, 2020; Muneeb et al., 2020). Effective human resource performance enhances the characteristics of the academic and educational system (Grenčíková, Kordoš, Navickas, & Practice, 2021). Additionally, research and knowledge transfer activities facilitate the communication and visibility of scientific knowledge and technical know-how, improving the perceived image of HEIs (Anggraini, Abdul-Hamid, & Kassim, 2018). However, the consolidation of core competencies in HEIs depends on investment policies and access to various financing sources (Cavallaro & Lepori, 2021).

Competitive Advantage

Chen et al. (2023) explain that universities can achieve a competitive advantage through continuous research development, by utilizing valuable resources and meeting market needs, as demonstrated by evaluation studies based on the theory of sustainable competitive advantage. Similarly, Bidayati, Thoyib, Aisjah, & Rahayu (2023) tate that universities achieve competitive advantage through various means, including leadership style, total quality management, knowledge management, technological innovation, and organizational culture. Managing intellectual capital in universities can lead to competitive advantage by leveraging the knowledge, skills, and innovation inherent in human resources, ultimately enhancing performance and sustainability (Alkhateeb, Yao, Kie, & Shaban, 2016). IT innovation directly increases competitive advantage in universities, as demonstrated in a case study of STMIK in Indonesia, which underscores the importance of leveraging IT for strategic value creation (David, Abdurachman, Bandur, & Kosasih, 2023). According to Waśkowski & Jasiulewicz (2015), universities gain a competitive advantage through marketing innovations, such as new product offerings, branding strategies, and pricing policies, which strengthen their position in the educational market.

Intelectual Capital and Core Competencies

The Resource-Based View (RBV) theory significantly influences the development of core competencies in organizations. RBV stresses the strategic importance of identifying and utilizing valuable resources to build competitive advantages (Yuga & Widjaja, 2020). David et al. (2023) describe this theory as emphasizing the importance of resources that are rare, inimitable, and organizationally embedded to achieve sustainable competitive advantage. By examining collective intelligence and organizational learning processes, RBV enhances understanding of how core competencies are developed and sustained over time.

According to Bucăța & Tileagă (2023), intellectual capital is crucial in shaping core competencies in universities, where it consists of human, organizational, and relational capital, significantly influencing their performance. Supporting this, Hadiyanto (2009) found that structural capital positively affects core competencies in higher education.

Within intellectual capital, three main pillars—human, structural, and relational capital—collectively influence core competencies in higher education institutions. The synergistic interaction among these aspects fosters a robust institution capable of providing quality education, supporting relevant research, and building sustainable partnerships with society and industry. Thus, intellectual capital is key to strengthening the core competencies of colleges and universities. Therefore, the hypotheses in this study are as follows:

H1a: Human capital affects core competence

H1b: Structural capital affects core competence

H1c: Relational capital affects core competence

Intelectual Capital and Competitive Advantage

The Resource-Based View (RBV) emphasizes internal characteristics such as resource scarcity, which significantly impacts the sustainable competitiveness of universities and plays a crucial role in understanding their competitive advantage (Nayak, Bhattacharyya, & Krishnamoorthy, 2023; Yuga & Widjaja, 2020). Research by Cahyani & Riani (2022) explains that intellectual capital plays a vital role in influencing competitive advantage in higher education. Studies have shown that strategic human resource

management practices positively impact competitive advantage in academic institutions.

RBV also highlights the importance of tangible, intangible, and capability aspects in gaining a competitive advantage in the higher education sector. By utilizing RBV, universities can strategically leverage their internal resources to enhance their competitive position, attract funding, and improve overall performance, thus fostering institutional change (IC) that shapes their competitive landscape. Therefore, the hypotheses in this study are as dollows:

H2a: Human capital affects competitive advantage

H2b: Structural capital affects competitive advantage

H2c: Relational capital affects competitive advantage

Core Competencies and Competitive Advantage

By aligning Resource-Based View (RBV) principles with core competencies derived from intellectual capital (IC) resources and strategic positioning strategies, universities can strengthen their market position and ensure long-term success amid increasingly competitive higher education environments (Kodua, 2019). Research by Lee, Wu, and Jong (2022) shows that in Taiwan, studies on SMEs emphasize that core competencies directly impact alliance performance, which ultimately contributes to competitive advantage. Furthermore, Ulum, Harviana, Zubaidah, & Jati (2019) highlighted that the quantification of core competencies in creative professional organizations underscores the importance of institutional capabilities and learning capabilities in gaining competitive advantage within the creative industries in universities. Additionally, an analysis of research universities in China demonstrated a strong correlation between core competencies and overall university performance, indicating the significant role of core competencies in achieving competitive advantage (Shi, 2021)

Core competencies, such as academic excellence, reputation, innovation, and manageability, form the foundation for an educational institution’s competitive advantage. Institutions that excel in these competencies are better positioned to attract high-quality students, offer relevant and innovative academic programs, provide superior support services, and maintain a good reputation. This, in turn, enhances the institution's competitiveness in attracting students, securing funding,

and creating a positive impact on society. Thus, core competencies directly influence the competitive advantage of a college or university. The hypotheses in this study are as follows:

H3: Core competence affects competitive advantage

Intelectual Capital, Core Competencies and Competitive Advantage

The Resource-Based View (RBV) theory emphasizes the importance of unique and hard-to-replicate internal resources in achieving competitive advantage. In the context of universities, intellectual capital—including the knowledge, skills, and abilities of lecturers and staff—is a crucial resource. Through effective management and development of this intellectual capital, universities can enhance their core competencies, thereby creating sustainable competitive advantages in education, research, and community service.

Intellectual capital significantly impacts a university's ability to compete, with structural capital having the greatest influence, followed by relational and human capital (Al-Husban et al., 2023). Research by Yang (2018), suggests that by recognizing and nurturing intangible human resources, universities can develop core competencies that strengthen their competitive position in the higher education landscape.

Intellectual capital, which encompasses the knowledge, expertise, and innovative assets of a university, plays a crucial role in shaping the institution's competitive advantage. Strong intellectual capital enables universities to develop unique and superior core competencies, such as specialized expertise, innovative teaching methods, and relevant, high-impact research. These competencies distinguish universities from other institutions and enhance their ability to offer high-quality education, produce graduates ready for professional challenges, and build a strong national and international reputation. Thus, intellectual capital not only directly influences competitive advantage but also enhances core competence, a key element in achieving and maintaining a superior position in global competition. The hypotheses in this study are as follows:

H4a: Human capital affects competitive advantage through core competence

H4b: Structural capital affects competitive advantage through core competencies

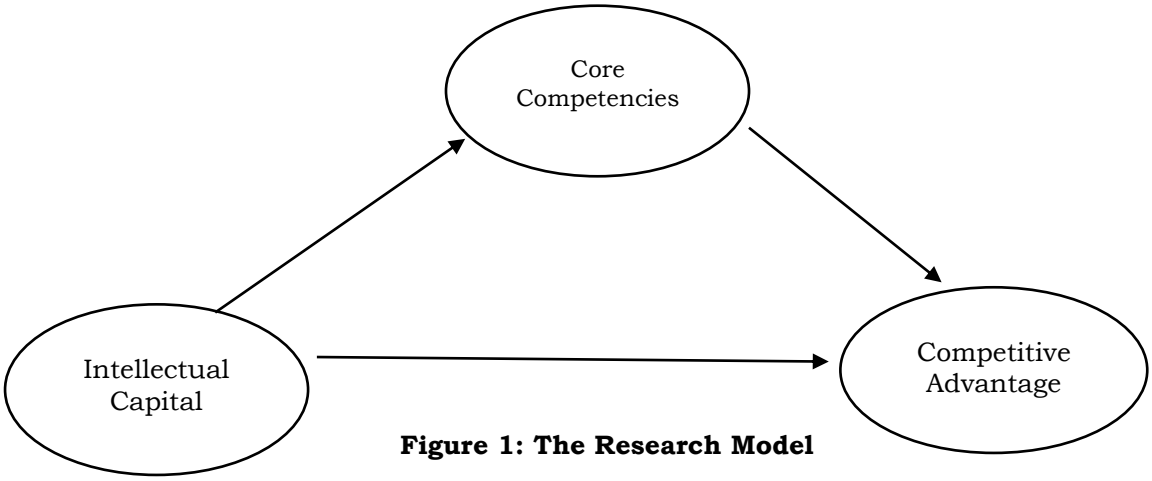

Figure 1: The Research Model

H4c: Relational capital affects competitive advantage through core competence

The hypothesized relationship of the variables is depicted in Figure 1.

METHOD

Research Design and Sample

The population for this study comprises all universities listed in the 2023 Webometrics world university rankings, which evaluate universities globally based on their web presence and performance. The sample includes lecturers from Indonesian universities that appear in the 2023 Webometrics rankings. A simple random sampling method was employed to select participants, focusing on lecturers involved in planning and administrative tasks. This approach ensures that the sample is representative of the broader population of interest without bias toward specific individual qualities but based solely on their affiliation with the listed universities.

Data Collection Techniques

This study employed a self-administered questionnaire to gather data from university lecturers across Indonesia. The universities selected for participation were those listed in the 2023 Webometrics ranking of world universities. Out of 105 distributed questionnaires, 93 were returned, resulting in a response rate of 88%. Of the returned questionnaires, 87 were complete and usable for analysis, representing an 82% usability rate.

Respondent demographics revealed a balanced gender distribution, with 48 men (52%) and 45 women (48%). In addition, age distribution among respondents showed a higher concentration in the mid-age ranges. The survey also

reveals participation from a range of Indonesian universities, with the highest engagement from Universitas Sebelas Maret and Universitas Muhammadiyah Yogyakarta, each contributing 9 respondents (10%). Other notable participations came from Universitas Brawijaya and Universitas Muhammadiyah Malang with 7 respondents each (8%). Contributions from additional universities varied, with smaller institutions like Universitas Mercu Buana and Universitas Negeri Surabaya also participating. Overall, 93 participants across these universities provided a diverse set of academic perspectives for the study.

The questionnaire, designed to measure intellectual capital, core competencies, and competitive advantage, utilized a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The questionnaire's design was informed by established scales from previous studies: intellectual capital was measured following the methodology of Iqbal, Latif, Marimon, Sahibzada, & Hussain (2019), and core competencies and competitive advantage were measured according to the frameworks proposed by Marulanda-Grisales & Vera-Acevedo (2023).

Data Analysis

Analysis was conducted using Structural Equation Modeling (SEM) with Partial Least Square (PLS) 3.0 software, suitable for performing confirmatory factor analysis which offers more reliable and valid results (Ramírez & Ponce, 2013). The analysis was divided into two main assessments:

1. *Assessing the Outer Model or Measurement Model*

Validation of the questionnaire was critical, requiring a loading factor value greater than 0.5 for validity. Reliability was confirmed with a composite reliability value greater than 0.7 and an average variance extracted (AVE) value greater than 0.5.

2. *Assessing the Inner Model or Structural Model*

This phase tested the mediation effect of core competence among the variables, focusing on R-squared values and path coefficients to determine if the hypotheses were statistically supported, examining both direct and indirect effects.

RESULTS AND DISCUSSION

Measurement Model Evaluation

This study employs validity and reliability tests to confirm the appropriateness of the constructs and

Table 1. Values of Loading Factor, Composite Reliability, and AVE

Construct	Indicator	Outer Loading Factor	AVE	Composite Reliability
Intellectual Capital	HC.1	0.897	0.640	0.897
	HC.2	0.902		
	HC.3	0.858		
	HC.4	0.707		
	HC.5	0.589		
	SC.1	0.907	0.581	0.919
	SC.2	0.902		
	SC.4	0.768		
	SC.5	0.752		
	SC.6	0.780		
	SC.7	0.733		
	RC.2	0.703	0.519	0.744
	RC.3	0.673		
	RC.4	0.727		
Core Competencies	CC.1	0.715	0.718	0.938
	CC.2	0.794		
	CC.3	0.928		
	CC.4	0.910		
	CC.5	0.943		
	CC.6	0.769		
Competitive Advantage	CA.1	0.892	0.576	0.902
	CA.2	0.895		
	CA.3	0.889		
	CA.4	0.592		
	CA.5	0.725		

their indicators. According to Ghozali & Latan (2015), an indicator's outerloading factor must be at least 0.5 to validly reflect a variable. Reliability is assessed through the composite reliability value, with a construct considered reliable if this value exceeds 0.70. Additionally, the Average Variance Extracted (AVE) is evaluated, requiring a minimum value of 0.50 to ensure adequate variance captured by the construct.

The analysis results for the study's constructs (Table 1) demonstrate robust validation and reliability of the measures used, as evidenced by the data on outer loading factors, Average Variance Extracted (AVE), and composite reliability. Intellectual Capital is segmented into three subcategories: Human Capital (HC), Structural Capital (SC), and Relational Capital (RC). For Human Capital, indicators range from 0.589 to 0.902 in outer

loading factors, showing a strong contribution to the construct, with an AVE of 0.640 and a composite reliability of 0.897, indicating high internal consistency. Structural Capital displayed similar robustness with outer loading factors between 0.733 and 0.907, an AVE of 0.581, and a particularly high composite reliability of 0.919. Relational Capital, though slightly lower, still maintains adequate validity with outer loading factors from 0.673 to 0.727, an AVE of 0.519, and composite reliability at 0.744.

Core Competencies, measured across six indicators, showed strong outer loading factors from 0.715 to 0.943, underscoring the potent impact of each indicator on the construct. The AVE here was notably high at 0.718, paired with an exceptional composite reliability of 0.938, indicating outstanding internal consistency and a significant explanation of variance within the construct. Lastly, Competitive Advantage was evaluated through five indicators, where outer loading factors varied between 0.592 and 0.895, illustrating a strong individual contribution to the construct. The AVE was satisfactory at 0.576, and the composite reliability was robust at 0.902, showing high reliability.

These findings affirm that all constructs and their indicators are not only valid but also reliably reflect the variables they intend to measure, meeting the rigorous standards set for research within this domain. Each construct's indicators significantly contribute to understanding the underlying dimensions of intellectual capital, core competencies, and competitive advantage in a university setting, with all measures exceeding the recommended thresholds for assessing educational institutions.

Structural Model Evaluation

The structural or inner model in the study is evaluated to ascertain the correlations between constructs, the significance of the path coefficients, and the explanatory power (R-square) of the model. This evaluation process involves assessing the R-square values for the dependent constructs and conducting t-tests to gauge the significance of the structural path parameters.

The analysis of R-square values highlights the explanatory capacity of the independent variables within the study. Notably, the "Competitive Advantage" variable demonstrates an R-square value of 0.841, signifying that it accounts for 84% of the variance in competitive advantage, which underscores its substantial

Table 2. Path Coefficients between Variables and Significance Tests

	Original Sample (O)	T Statistics (|O/STDEV|)	P Values	Decisions
Human Capital -> Core competencies	0.587	6.068	0.000	Accepted
Human Capital -> Competitive Advantage	0.726	14.653	0.000	Accepted
Relational Capital -> Competitive Advantage	0.197	3.008	0.003	Accepted
Relational Capital -> Core competencies	0.03	0.406	0.685	Rejected
Structural Capital -> Competitive Advantage	-0.201	2.936	0.003	Accepted
Structural Capital -> Core competencies	0.223	2.609	0.003	Accepted
Core competencies -> Competitive Advantage	0.367	3.728	0.000	Accepted

Table 3. The Mediating Effect Testing

Independent	Mediating	Dependent	T statistic	p-value	Conclusion
Human Capital	Core competencies	Competitive Advantage	3.936	0.000	Accepted
Relational capital	Core competencies	Competitive Advantage	0.580	0.720	Rejected
Structural capital	Core competencies	Competitive Advantage	1.529	0.112	Rejected

influence within the model. Similarly, the "Core Competency" variable shows an R-square value of 0.805, indicating that the combination of human capital, structural capital, and relational capital can explain 80% of the variation in core competencies. This also suggests that core competencies act as a mediating factor, influencing the relationship with the dependent variable, competitive advantage, thereby highlighting their critical role in the structural model of this research.

Hypothesis Testing

The analysis utilizes T-statistics to determine the significance of the relationships between variables, with the acceptance threshold set at a T-value greater than 1.960. The impact of human capital is markedly significant on both core competencies and competitive advantage, as demonstrated by high T-statistics of 6.068 and 14.653, respectively. These results indicate that improvements in human capital not only enhance core competencies but also directly bolster competitive advantage. Furthermore, the analysis confirms that core competencies significantly mediate the relationship between human capital and competitive advantage.

Therefore, the hypotheses H1a, H2a, and H4a are supported.

In the case of relational capital, there is a significant direct effect on competitive advantage, evidenced by a T-value of 3.008, surpassing the critical threshold. However, its influence on core competencies does not reach statistical significance, with a T-statistic of 0.406 and a p-value of 0.685, suggesting that core competencies do not mediate the impact of relational capital on competitive advantage. This indicates a straightforward relationship where relational capital enhances competitive prowess without the intermediary effect of core competencies. Therefore, the hypothesis H1b is supported, yet the hypotheses H2b and H4b are not supported.

Structural capital shows significant effects on both core competencies and competitive advantage, with T-values of 2.609 and 2.936, respectively. Despite these direct impacts, the study reveals that core competencies do not significantly mediate the relationship between structural capital and competitive advantage, as the mediation effect does not meet the significance criteria with a T-value of 1.529 and a p-value of 0.112. Therefore, both hypotheses H1c and H2c are supported, yet the hypothesis H4c is not supported.

The effect of core competencies on competitive advantage is robustly demonstrated in the study. The analysis shows a significant direct relationship between core competencies and competitive advantage, with a path coefficient of 0.367, a T-statistic of 3.728, and a p-value of 0.000. These results confirm that core competencies substantially contribute to enhancing competitive advantage. Therefore, the hypothesis H3 is supported.

The overall results underscore the critical roles played by various forms of capital in shaping competitive dynamics and organizational capabilities. Human capital proves to be a cornerstone, significantly affecting both core competencies and competitive advantage directly and through mediation. In contrast, relational and structural capitals demonstrate strong direct impacts but do not channel their effects through core competencies significantly.

CONCLUSION, IMPLICATION AND LIMITATION

The findings reveal the pivotal role of human capital in driving

competitive advantage both directly and through core competencies. While relational capital enhances competitive advantage, it does not contribute significantly to core competencies. Structural capital needs careful management to ensure that its benefits to core capabilities do not adversely affect overall competitive positioning.

For university administrators and policymakers, these results emphasize the importance of investing in human capital development, such as training and professional development, to bolster core competencies and competitive advantage. Universities should also strategize to balance the development of structural capital to support, rather than hinder, flexibility and innovation.

The study acknowledges limitations in its scope, particularly in the mediation roles of core competencies between different types of capital and competitive advantage. Future research could explore these dynamics in more detail, particularly how different configurations of intellectual capital components might interact to shape competitive outcomes in various educational settings.

Further studies could examine the interplay between relational and structural capital more comprehensively, possibly considering different environmental contexts or contrasting academic cultures to generalize the findings more broadly.

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