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Impact of Intellectual Capital and Dynamic Capabilities on Sustainable Competitive Advantage: Empirical Studies Private Higher Education in Indonesia

Elistia Elistia¹, Dedi Purwana², Karuniana Dianta Sebayang³, Mohammad Sofwan Effendi⁴, Corry Yohana⁵

¹Postgraduate student, Universitas Negeri Jakarta, Indonesia

^{2,3,4,5}Faculty of Economics, Universitas Negeri Jakarta, Indonesia

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Abstract: Private higher education institutions (PHEIs) should prioritize continuous enhancement to make meaningful contributions to teaching, research and community service. Increased competition in the higher education sector and the emergence of new issues have compelled universities to improve their management. Business management techniques, leadership skills, profitability standards, investment practices, and marketing strategies have become significant in the context of higher education. This research aims to evaluate the influence of intellectual capital (IC) and dynamic capabilities (DC) on the sustainable competitive advantage (SCA). The research sample, using the probability sampling technique, consisted of 92 top management members from 10 PHEIs in Jakarta, Indonesia, which have excellent accreditation. The collected data were then analyzed using the Structural Equation Model. Research findings indicate that a combination of IC and DC PHEIs is necessary to achieve a sustainable competitive advantage. Moreover, the influence of DC strengthens the connection between the IC and SCA. The synergistic impact of both IC and DC plays a crucial role in SCA's capacity to effectively execute Tri-Dharma higher education, drive innovation, adapt to evolving market dynamics, engage stakeholders, and leverage technological advancements. This study stands out for its theoretical improvements to the Cogwheel Model of Dynamic Capabilities and the proposition Model of Continuous Improvement Initiatives. The research findings highlight the relevance of determinant factors in analyzing the dimensions of IC, DC, and SCA, which serve as a foundation for evaluating higher education management. This will enable SCA to deliver exceptional educational services and generate novel ideas to advance its compelling vision, mission, and objectives. Consequently, PHEIs must consistently strive to uphold and enhance their organizational performance in the areas of community service, research and education.

Keywords: Dynamic Capabilities, Intellectual Capital, Private Higher Education, Sustainable Competitive Advantage.

知识资本和动态能力对可持续竞争优势的影响：来自印度尼西亚私立高

Corresponding Author: Elistia Elistia, Postgraduate student, Universitas Negeri Jakarta, Indonesia; email: Elistia_9917920002@mhs.unj.ac.id

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等教育的证据

摘要: 私立高等教育机构 (PHEIs) 应优先考虑持续改进, 为教学、研究和社区服务做出有意义的贡献。高等教育领域竞争的加剧和新问题的出现迫使大学改善管理。商业管理技巧、领导技能、盈利标准、投资实践和营销策略在高等教育背景下变得非常重要。本研究旨在评估知识资本 (IC) 和动态能力 (DC) 对可持续竞争优势 (SCA) 的影响。研究样本采用概率抽样技术, 包括来自印度尼西亚雅加达 10 所 PHEIs 的 92 名高层管理人员, 这些机构都拥有出色的认证。然后使用结构方程模型分析收集的数据。研究结果表明, 要实现可持续的竞争优势, 必须结合 IC 和 DC PHEs。此外, DC 的影响加强了 IC 和 SCA 之间的联系。IC 和 DC 的协同作用对于 SCA 有效实施三法高等教育、推动创新、适应不断变化的市场动态、吸引利益相关者和利用技术进步的能力起着至关重要的作用。这项研究因其对动态能力齿轮模型和持续改进计划前置模型的理论改进而脱颖而出。研究结果强调了决定性因素在分析 IC、DC 和 SCA 维度中的相关性, 这些维度是评估高等教育管理的基础。这将使 SCA 能够提供卓越的教育服务并产生新颖的想法来推进其令人信服的愿景、使命和目标。因此, PHEIs 必须不断努力维护和提高其在社区服务、研究和教育领域的组织绩效。

关键词: 动态能力、智力资本、私立高等教育、可持续竞争优势。

1. Introduction

The major transformations in the global economy recently have had a significant impact on the high volume of commercial transactions between different countries, which requires organizations in all fields, including the productive, marketing, financial, and education sectors, to make strategic adjustments (Petricevic & Teece, 2019). This transformation has also led to an increase in the intensity of competition between organizations and countries, which means organizations must adapt to ensure their survival in their respective markets; otherwise, the risk of competition will threaten their existence (Kang & Na, 2020). Global competition triggers the need for better governance. In an increasingly competitive environment, an organization must have a strong strategy to create value and gain a competitive advantage (Friis et al., 2016; Hernández-Perlines et al., 2016). Higher education institutions (HEIs) are organizations that can create an abundance of knowledge for the advancement of their institutions and for their business interests (Ramjeawon & Rowley, 2017). Therefore, HEIs must create effective management strategies (Soniewicki & Paliszkiwicz, 2019). The Sustainable Development Goals (SDGs) areas follows: development that maintains the continuous improvement of the economic welfare of the community; development that maintains the sustainability of the social life of the community; development that maintains the quality of the environment; development that guarantees justice; and the implementation of governance that is able to maintain improving the quality of life from one generation to the next (Kementrian PPN-SDGs Indonesia, 2020). Based on the SDG' vision, educational institutions such as universities develop and determine their vision, which refers to the SDGs and refers to their organizations. Thus, the relationship between HE and

the labor market is very important in shaping the competitiveness of HEIs and businesses, based on the fact that sustainable competitive advantage is the most valuable resource of any organization. An educated workforce provides higher productivity and an economy based on high added value (Dimitrova et al., 2017).

In the context of continuous improvement initiatives (CII), researchers have elaborated on the conceptual framework and several propositions proposed by Gutierrez-Gutierrez and Antony (2020). The researchers developed the concept by elaborating it into three variables: intellectual capital (IC), Dynamic Capabilities (DC), and Sustainable Competitive Advantage (SCA). Assessment of the competitiveness of an organization aims to determine its competitive position in relation to other competitors in the field in which it functions. This assessment is based on environmental analysis to identify opportunities and threats that exist for the realization of activities. The performance of Indonesian higher education institutions is identified on the basis of four main aspects: the quality of human resources and students (input), institutional management of higher education institutions (process), short-term performance achievements achieved by higher education institutions (output), and long-term performance achievements of higher education institutions (outcomes). Based on data from the Private Higher Education Accreditation Profile (PHEIs) sourced from the Higher Education Database from the Directorate General of Higher Education, Ministry of Education and Culture, Research and Technology of the Republic of Indonesia (Ditjen Dikti, 2023), there are 182 private higher education (PHEIs) in Region 3 Higher Education Service Institutions, there are 182 private higher education (PHEIs). The number of PHEIs accredited with an Excellence ranking or rank A are totaling 16 PHEIs (8.79%), and the number of accredited Very Good (rank B) are 64 PHEIs (35.16%), while those with Good accreditation (C) are 50 PHEIs (27.47%). Therefore, the total number of PHEIs that

have been accredited is 130, while another 52 private higher education institutions (28.57%) are currently in the higher education accreditation process (Lldikti3.kemdikbud.go.id, 2023).

From the review of problems and empirical research in relevant literature, the researchers identified the following research gaps:

First, researchers found gaps in dimensions and indicators that appeared in previous research on sustainable competitive advantage as an endogenous variable, namely, in higher education, which discussed several aspects: (1) Dynamic Capabilities as an Exogenous Variable (Sriwidadi et al, 2016; Takahashi et al, 2017, dan Stolze & Sailer, 2021); also as a Mediating Variable (Malek Bakheet Elayan & Sleimi, 2021); (2) Intellectual Capital as an Exogenous Variable (Indiyati, 2018; Anggraini et al., 2018; Qassas et al., 2021). Second, researchers found knowledge gaps in the 10 (ten) proposed concept model propositions from Gutierrez-Gutierrez & Antony (2020) about the relationship model between dynamic capabilities and the achievement of a sustainable competitive advantage. These gaps were rarely explored in previous research and seem important and worthy of research in the context of examining important aspects of the sustainable competitive advantage. Third, this study broadens the scope of the investigation of intellectual capital in the context of ongoing development through its dynamic capabilities to achieve sustainable competitive advantage in higher education.

It is known that 8.79% of PHEIs in Jakarta hold Superior and A accreditations. This figure is alarmingly low, underscoring the critical need for additional research to identify the determinants of the sustainable competitive advantage. Conceptual capital and dynamic capabilities are the factors considered in this study. The following are the research queries on the research problem:

1. Are there significant effects of intellectual capital, dynamic capabilities, and a sustainable competitive advantage?
2. Is there a significant effect of intellectual capital through dynamic capabilities on a sustainable competitive advantage?

2. Literature Review

2.1. Sustainable Competitive Advantage in Higher Education

Knowledge, science, and innovation should be the main prospects for growth and competitiveness (Valionienė, 2016). When living in conditions of minimal public resources, the effectiveness of public spending must be reviewed (Ginevičius et al., 2018). How well higher education science and policy match rapidly changing demands and how successfully goals are implemented depends largely on the flexibility and

adaptability of strategic planning. Competition in higher education environments and emerging challenges have caused universities to reorganize their management. Management methods, leadership, profitability criteria, investment, and marketing strategies adopted from business have become important in higher education (Popovic et al., 2018). Management, leadership, profitability criteria, investment, and marketing strategies adopted from business have become commonplace in higher education (Baltaru & Soysal, 2018; Bilevičiūtė et al., 2012; Giziënė et al., 2008; Prisăcariu, 2015).

2.2. Dynamic Capabilities in Higher Education

The DC approach was created to clarify how the resource base can be reconfigured in a changing environment. DC expands the resource-based view concept by emphasizing that a company's competitive advantage does not derive from its possession of strong resources and capabilities but from its ability to adapt, integrate, reconfigure, and update these resources and capabilities in a timely and flexible manner. that can effectively cope with environmental changes (Eisenhardt & Martin, 2000; Cavusgil et al., 2007). Takahashi et al. (2017) evaluated a model that adopts issues around the dimensions of dynamic capabilities, according to the educational sector, based on authors such as Teece (2009), Protogerou et al., (2012), Pavlou & El Sawy (2011) and Wilden et al. (2013), environmental monitoring, identifying opportunities for educational programs and services, use of own processes to identify target markets, aligning service offerings with market demand, dedication of HEIs to improving existing services, implementation of new administrative methods, process updates business, effective internal communications, effective implementation of necessary changes, integration of HEIs decisions, allocation of resources, standardization of processes, formal controls, training and the creation of new management and academic knowledge.

2.3. Intellectual Capital in Higher Education

The term intellectual capital was first introduced by John Kenneth Galbraith in 1969. He proposed that IC is a level of action that requires brain exercise. Intellectual capital is a set of knowledge-based activities necessary for the growth and development of an organization. To understand the complex phenomenon of intellectual capital in depth, Khalique et al. (2011) proposed an integrated intellectual capital model (IICM), which is based on six components: human capital, customer capital, structural capital, social capital, technological capital and spiritual capital. Human capital is a combination of education, skills, attitudes, knowledge, and intellectual agility (Edvinsson, 1997). The literature further categorizes IC into four dimensions: human

capital (HC), structural capital, social capital, and relational capital (Slađana Cabrilo & Dahms, 2018; Khavandkar & Kar, 2013). Khalique et al. (2011) proposed an integrated intellectual capital model (IICM), namely: human capital, customer capital, structural capital, social capital, technological capital and spiritual capital.

3. Hypotheses Development and Research Framework

3.1. Impact of Intellectual Capital on Dynamic Capabilities

Referring to Teece (2018), one of the prerequisites for dynamic capabilities is stability in organizational activities that develops improvements and modifications to operational routines to increase effectiveness. Combining and recombining these assets to realize improvements is a characteristic of dynamic capabilities. Assessment of intellectual capital through company human resources, which can be defined as the collective ability of employees to solve customer problems (Storey, 2016). Business assets typically include processing facilities, distribution networks, prospect lists, supplier networks, service strengths, and external organizational capabilities (Demir, 2021). Previous research suggests that there is a positive and significant influence between intellectual capital (IC) and dynamic capabilities (DC) (van Reijssen et al., 2015; Aminu & Mahmood, 2015; Singh & Rao, 2016; Thanh Nhon et al., 2020; Salma & Anwar Muhammad, 2021; Ali et al., 2021). Therefore, based on theory, empirical facts, and relevant research, this research further examines IC against DC. Therefore, this study proposes the following hypothesis:

H1: Intellectual capital positively and significantly impacts dynamic capabilities.

3.2. Impact of Intellectual Capital on Sustainable Competitive Advantage

Intellectual capital is widely discussed in developed countries for creating organizational value. In a competitive market, intellectual capital provides a competitive advantage for organizations (Barkat & Beh, 2018). Intellectual capital is considered an intangible asset that differs from tangible resources such as raw materials, land, and financial capital that can be obtained (Qian & Huang, 2017). Intellectual capital has become the most important source for maximizing other assets in institutions and organizations because it is a catalyst for increasing material returns and achieving construction (Areiqat & Zamil, 2019). Thus, intellectual capital is the main source of competitive advantage and a factor that influences the success of institutional performance and strengthens an organization's competitive position (Gogan & Duran, 2014; Areiqat et al., 2020). Chen et al. (2015) stated that companies with

high intellectual capital are more competent in innovating and improving their performance. Many researchers consider the fact that new product expansion can be sustained through the development of intellectual capital within a company (Chung et al., 2016; Peñalba-Aguirrezabalaga et al., 2020; Subramanian & van de Vrande, 2019). Previous research suggests that there is a positive and significant influence between IC and SCA in higher education (Indiyati, 2018; Anggraini et al., 2018; Abu-Rumman, 2018; Iqbal et al., 2019; Qassas et al., 2021), the telecommunications sector (Kanaan et al., 2020), and pharmaceutical companies (Malkawi et al., 2018). The difference between researchers is the dimensions used as research instruments and model constellations that have not been carried out in higher education. Therefore, based on theory, empirical facts, and relevant research, this research further examines IC toward SCA. Therefore, this study proposes the following hypothesis:

H2: Intellectual capital positively and significantly impacts a sustainable competitive advantage.

3.3. Impact of Dynamic Capabilities on Sustainable Competitive Advantage

Dynamic capabilities are managerial capabilities necessary to maintain and adapt the organizational resource base to achieve organizational efficiency (Eisenhardt & Martin, 2000; Teece, 2007) and manage an integrated company, as well as build and reconfigure competencies internal and external (Petricevic & Teece, 2019). In this case, strong dynamic capabilities are essential for companies to promote the organizational agility required to operate in an environment of uncertainty because this uncertainty determines a company's ability to innovate, adapt, and create change (Nuruzzaman et al., 2019; Teece, 2018). Previous research suggests that dynamic capabilities have a positive and significant influence on sustainable competitive advantage in higher education (Sriwidadi et al., 2016; Elayan & Sleimi, 2021), the ICT sector (Gyemang & Emeagwali, 2020; Thanh Nhon et al., 2020), the banking sector (Ali et al., 2021), and (Gutierrez-Gutierrez & Antony, 2020) for the Systematic Literature Review (SLR). The difference between researchers is the dimensions used as research instruments and the constellation of research models that have not been carried out in higher education. Therefore, based on theory, empirical facts, and relevant research, this research further examines DC against SCA. Therefore, this study proposes the following hypothesis:

H3: Dynamic capabilities have a positive and significant effect on Sustainable Competitive Advantage.

3.4. The impact Of Intellectual Capital on Sustainable Competitive Advantage mediated by Dynamic Capabilities

Over the last two decades, many organizations around the world have realized the need to develop intellectual capital, which is a basic ingredient in their business growth (Sladjana Cabrilo et al., 2018). Meanwhile, intellectual capital is accepted as a key component for promoting organizational assets responsible for improving its products to gain a competitive advantage in a dynamic market environment (Mutuc et al., 2019). It is further said that when intellectual capital is managed effectively, it can be profitable and to reduce various organizational problems, providing a competitive advantage (Ferreira et al., 2021). Therefore, the performance of such firms improves because of this competitive advantage, which confirms the existence of an indirect relationship between seizing capabilities and intellectual capital (Choi et al., 2018).

Many researchers use the competitive advantage of mediating variables to strengthen the relationships mentioned above (Zhou et al., 2019; Khourouh et al., 2020). Furthermore, several studies have analyzed the role of various dynamic capabilities highlighted in several previous empirical studies with different contributions to the status of intellectual capital (Wendra et al., 2019; Engelman et al., 2017). Therefore, based on theory, empirical facts, and relevant research (Scafarto et al., 2016; Engelman et al., 2017; S. Choi et al., 2018; Thanh Nhon et al. (2020), there are differences between researchers in that dimensions and objects are still rarely carried out in higher education, so this research proposes the following hypothesis:

H4: Intellectual capital positively and significantly impacts a sustainable competitive advantage, which is mediated by dynamic capabilities.

3.5. Research Model

From the empirical study of phenomena, theoretical basis, and relevant research literature, the researcher developed a framework of thought described in the following research concept model:

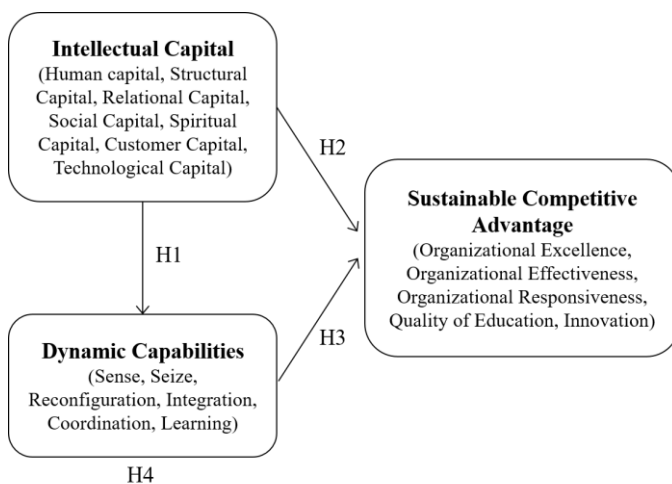


Figure 1. Research Framework (developed by the authors)

4. Research Methodology and Data Analysis

4.1. Research Method

This type of research design is causal with a quantitative approach. The primary data used is primary data originating from filling out a research instrument questionnaire that uses a survey by filling out the questionnaire online via a Microsoft online form. This research was conducted with the leaders of private universities in Jakarta Region III Higher Education Service Institutions. The data collection process taken from April to December 2023.

4.2. Sample and Data Collection

The characteristics of the population comprise the heads of higher education institutions accredited as A or superior institutions for universities in the Jakarta Region III Higher Education Service Institutions, totaling 11 (eleven) private higher education institutions consisting of the Rector/Deputy Chancellor, Faculty Dean, Head of Research and Community Service Institute, and Head of Institution Quality Assurance. The researchers selected 10 (ten) private universities, as attached in Table 3 below. The sampling technique used in this research was probability sampling with a proportionately stratified sampling approach (Hair et al., 2019). The sample selection follows the criteria of private higher education institutions that have achieved excellent accreditation, aiming to ensure the organization's homogeneity. The chosen respondent is the head of the university's unit and serves as a representative for the unit within the organization, thereby facilitating the completion of the management evaluation. To determine the number of samples from a total population of 127 (one hundred and twenty-seven) people consisting of the Vice Chancellor/Rectorate, Dean/Deputy Faculty, Head of Quality Assurance, and Head of Research and Community Service, who play a role as the units of analysis for this research, based on the Krejcie & Morgan (1970) table, a sample size of 92 (one hundred and three) respondents was obtained.

An overview of the demographic data from a total of 92 respondents, namely, 51 men (55.4%) and 41 women (44.6%). For functional positions, 6 people (6.5%) held the functional position of expert assistant, 33 experts (35.9%), 34 associate professors (37%), and 19 professors (20%). Therefore, it can be stated that the functional position of most respondents is an associate professor. Furthermore, 2 people (2.2%) have worked for less than 5 years, 18 people had worked for 5–10 years (19.6%), 23 people have worked for 11–20 years (25%), 22 people (23.9%) worked 21–30 years, 26 people worked 31–40 years (28.3%), and 1 person had worked more than 40 years (1.1%).

4.3. Instrument Development

The construction of the statement instrument is operationalized with a multi-item scale based on previously validated measures, and each scale item uses a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The total number of measurements in this research is 55 instruments listed in Table 1 below:

Table 1. Variable Measurement (developed by the authors)

Variable	Items	Source
Sustainable Competitive Advantage		
Organizational Excellence	4	(Kising'u et al., 2016)
Organizational Effectiveness	4	
Organizational Responsiveness	3	
Quality of Education Innovation	3	(Qassas et al., 2021)
	3	
Dynamic Capabilities		
Sense	3	(Helfat et al., 2009),
Seize	3	(Protogerou et
Reconfiguration	3	al..2012),(Pavlou & El
Integration	3	Sawy, 2011), (Wilden et
Coordination	3	al., 2013)
Learning	2	
Intellectual Capital		
Human Capital	3	(Qassas et al., 2021), (Hsu & Fang, 2009)
Structural Capital	4	(Bueno et al., 2006), (Ismail, 2005)
Relational Capital	3	(Qassas et al., 2021); (Bontis, 1998); (Hsu & Fang, 2009)
Social Capital	3	(Bueno et al., 2006),
Spiritual Capital	2	(Ismail, 2005)
Customer Capital	3	
Technological Capital	3	

4.4. Data Analysis

This quantitative research uses variance-based Structural Equation Modeling (SEM) to test the hypotheses in the conceptual model. The SEM is used to model multiple independent and dependent variables, chains of causal effects, and indirect effects (Lowry & Gaskin, 2014). Analytical techniques were used to interpret and analyze data using the Partial Least

Squares (PLS) approach with the SmartPLS version 4.0 software to test the hypotheses. Data processing and analysis used descriptive statistical analysis and inferential statistics with the multivariate analysis method. Estimating complex models using higher-order construct modeling (HCM). Based on Lohmöller (1989) in Hair et al. (2013), PLS-SEM can be designed as a hierarchical component model (HCM), which includes low-level observable components (lower-order components/LOCs) and high-level unobservable components (higher-order components/HOCs) to reduce model complexity (Hair et al., 2013). Data processing and analysis used descriptive and inferential statistics with the multivariate analysis method (Joseph F Hair et al., 2013). Analyze the research model and test the hypothesis using two measurement models, namely the outer model: factor loading value, average variance extracted, and reliability analysis. Then, inner model analysis (path coefficients, R-square (R^2), F-square (F^2), Stone Geisser value (Q^2), and model fit. The last step is hypothesis testing.

5. Results

5.1. Measurement Model Assessment

The data were processed using SMART PLS 4.0, and then analyzed using the outer model analysis measurement model, namely factor loading > 0.5, Average Variance Extracted > 0.5, and reliability analysis 0.6. All data in Table 2 show acceptable results (Hair et al., 2020).

Furthermore, latent variables are measured, which are reflected through dimensions and indicators (manifest variables); therefore, a higher-order construct measurement technique is required. Therefore, this measurement model uses type I second-order analysis (reflective measurement model), namely, the type where LOC reflects HOC, but LOC is measured with explicit indicators (reflective model measurement) to measure the influence of dimensions on latent variables (Crocetta et al., 2021).

Dimensional measurements of the latent variables are shown in Table 3 and Figure 2.

Table 2. Factor loading, Cronbach's alpha, composite reliability, and AVE (developed by the authors)

No	Variable	Factor loading > 0.5	Cronbach alpha > 0.6	Composite Reliability > 0.6	AVE > 0.5
Sustainable Competitive Advantage					
1	Organizational Excellence				
	SCA_OExc1	0.658	0.815	0.948	0.878
	SCA_OExc2	0.807			
	SCA_OExc3	0.609			
	SCA_OExc4	0.784			
2	Organizational Effectiveness		0.797	0.868	0.622

	SCA_OEf1	0.700				
	SCA_OEf2	0.715				
	SCA_OEf3	0.686				
	SCA_OEf4	0.677				
3	Organizational Responsiveness					
	SCA_OR1	0.755	0.860	0.915		0.781
	SCA_OR2	0.789				
	SCA_OR3	0.807				
4	Quality of Education					
	SCA_QE1	0.763	0.840	0.904		0.758
	SCA_QE2	0.784				
	SCA_QE3	0.820				
5	Innovation					
	SCA_In1	0.718	0.881	0.927		0.809
	SCA_In2	0.788				
	SCA_In3	0.739				
Knowledge Management						
1	Knowledge Sharing					
	KM_KS1	0.718	0.836	0.902		0.754
	KM_KS2	0.787				
	KM_KS3	0.766				
2	Knowledge Acquisition					
	KM_KA1	0.805	0.842	0.904		0.759
	KM_KA2	0.740				
	KM_KA3	0.773				
3	Knowledge Dissemination		0.930		0.953	0.556
	KM_KD1	0.677				
	KM_KD2	0.745	0.850	0.893		0.627
	KM_KD3	0.707				
	KM_KD4	0.725				
	KM_KD5	0.775				
4	Knowledge Use					
	KM_KU1	0.787	0.836	0.901		0.753
	KM_KU2	0.698				
	KM_KU3	0.723				
Dynamic Capabilities						
1	Sense					
	DC_Sn1	0.630	0.829	0.898		0.746
	DC_Sn2	0.691				
	DC_Sn3	0.787				
2	Seize					
	DC_Si1	0.815	0.860	0.914		0.781
	DC_Si2	0.750				
	DC_Si3	0.819				
3	Reconfiguration					
	DC_Rec1	0.774	0.814	0.889		0.728
	DC_Rec2	0.630			0.961	
	DC_Rec3	0.815		0.957		0.594
4	Integration					
	DC_Int1	0.690	0.899	0.937		0.832
	DC_Int2	0.780				
	DC_Int3	0.818				
5	Coordination					
	DC_Co1	0.821	0.853	0.911		0.774
	DC_Co2	0.819				
	DC_Co3	0.830				
6	Learning					
	DC_L1	0.790	0.883	0.945		0.895
	DC_L2	0.804				

Table 3. Measurement of Dimensional Contributions to Latent Variables (developed by the authors)

No	Variable	Path coefficient	t-value	f ²	Mean	Rank
Sustainable Competitive Advantage						
1	Organizational Excellence	0.875	28.842	3.266	4.628	4
2	Organizational Effectiveness	0.881	30.457	3.468	4.508	3

3	Organizational Responsiveness	0.887	36.243	3.680	4.446	2
4	Quality of Education	0.907	44.946	4.653	4.587	1
5	Innovation	0.833	21.745	2.266	4.464	5
Intellectual Capital						
1	Human Capital	0.860	31.992	2.838	4.446	2
2	Structural Capital	0.883	32.129	3.544	4.565	1
3	Relational Capital	0.856	31.926	2.747	4.529	4
4	Social Capital	0.825	21.625	3.544	4.554	3
5	Spiritual Capital	0.715	13.699	1.046	4.739	7
6	Customer Capital	0.832	21.436	2.257	4.529	6
7	Technological Capital	0.837	25.195	2.346	4.435	5
Dynamic Capabilities						
1	Sense	0.818	17.914	2.016	4.518	6
2	Seize	0.901	40.485	4.318	4.486	2
3	Reconfiguration	0.875	28.174	3.263	4.551	3
4	Integration	0.839	24.370	2.377	4.496	5
5	Coordination	0.937	62.668	7.140	4.439	1
6	Learning	0.843	24.592	2.448	4.631	4

Based on the data processing results shown in Table 3, we provide the following explanation of the influence of dimensions on the latent variable:

1. These three dimensions make the greatest contribution to Sustainable Competitive Advantage. The first dimension is Quality of Education, with an 87.5% path coefficient, a t-value of 44.9, and an f^2 of 4.587. The second dimension is organizational responsiveness, with an 88.7% path coefficient, a t-value of 36.243, and an f^2 of 3.680. The third dimension is organizational effectiveness, with an 88.1% path coefficient, a t-value of 30.457, and an f^2 of 3.468.

2. These three dimensions make the greatest contribution to Intellectual Capital. The structural capital dimension has an 88.3% path coefficient, a t-value of 32.129, and an f^2 value of 3.544. Human capital has an 86.6% path coefficient; the t-value is 31.992; and the f^2 is 2.838. Social capital has an 82.5% path coefficient, a t-value of 21.625, and an f^2 value of 3.544.

3. These three dimensions make the greatest contribution to Dynamic Capabilities. The coordination dimension was 93.7.7% path coefficient, the t-value was 62.668, and the f^2 was 7.140. Seize has a 90.1% path coefficient, t-value is 40.485, and f^2 is 4.318. Reconfiguration has an 87.5% path coefficient; the t-value is 28.147; and f^2 is 3.263.

5.2. Structural Model Analysis (Inner Model)

According to Miles (2005), the closer the R^2 value is to 1, the better is structural model analysis because it indicates how much of the variation in the endogenous variable the exogenous variable is responsible for explaining. In this study, the R^2 value for dynamic

capabilities was 0.854, indicating that intellectual capital contributed to explaining dynamic capabilities by 85.4%. Furthermore, the R^2 value for a sustainable competitive advantage is 0.732, indicating that intellectual capital and dynamic capabilities contribute to explaining a sustainable competitive advantage by 73.2%. Furthermore, for partial influence, namely effect size (f^2), according to Cohen (1988), the estimated value of f^2 is <0.2 (low); 0.2–0.8 (moderate); > 0.8 (high). The f^2 value can be seen in Table 6, which shows the partial influence of exogenous variables on endogenous variables. The results of the f^2 measurement in this research show that the influence on dynamic capabilities is from intellectual capital at 6.055 (high), on sustainable competitive advantage at 0.201 (moderate), and from dynamic capabilities at 0.035 (low).

The f^2 value is displayed in Table 4, which displays the partial impact of exogenous variables on endogenous variables. The findings of the f^2 measurement in this study indicate that intellectual capital has a significant influence on dynamic capabilities, with a magnitude of 6.055 (large). Additionally, it was observed that intellectual capital has a moderate impact on the sustainable competitive advantage, with a magnitude of 0.201 (medium). On the other hand, dynamic capabilities have a modest effect on the sustainable competitive advantage, with a magnitude of 0.035 (small). For the model fit measurement value, where the SRMR value must be less than 0.10 or 0.08 as a measure of suitability for PLS-SEM, which can be used to avoid model specification errors (Hu & Bentler, 1999), the SRMR value in this study is 0.070.

5.3. Research Model Hypothesis Testing

As stated in the research hypothesis, the results are presented in explanation, Table 4 and 5, and Figure 2.

Table 4. Results of structural model path coefficients (direct and indirect relationship) (developed by the authors)

Hypotheses	Relationship	β	t-value	p-value	Decision
H1	IC \rightarrow DC	0.924	55.555	0.000	supported
H2	IC \rightarrow SCA	0.599	4.166	0.000	supported
H3	DC \rightarrow SCA	0.271	1.831	0.034	supported
H4	IC \rightarrow DC \rightarrow SCA	0.272	1.822	0.034	supported
DC	$R^2 = 0.854$	IC \rightarrow DC	$f^2 = 6.055$		
SCA	$R^2 = 0.732$	IC \rightarrow SCA	$f^2 = 0.210$		
		DC \rightarrow SCA	$f^2 = 0.035$		

Table 5. Coefficients of determination and partial effect (developed by the authors)

R^2 values	Meaning	Partial Effect	Meaning
DC $R^2 = 0.854$	High	IC \rightarrow DC	$f^2 = 6.055$ High
SCA $R^2 = 0.732$	Moderate	IC \rightarrow SCA	$f^2 = 0.210$ Moderate
		DC \rightarrow SCA	$f^2 = 0.035$ Low

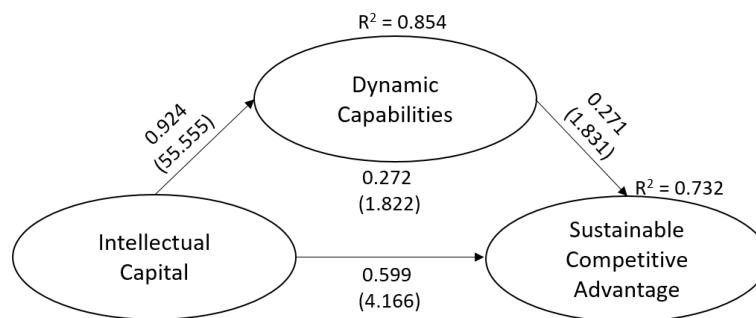


Figure 2. Result model of the hypotheses (developed by the authors)

1. The first hypothesis has a significance value of t-value = 55.555, p-value = 0.000, and path coefficient = 0.924, meaning that 92.6% of intellectual capital has a positive and significant effect on Dynamic Capabilities, so hypothesis 1 is accepted.

2. The second hypothesis has a significance value of t-value = 4.166, p-value = 0.000, and path coefficient = 0.599, meaning that 59.9% of intellectual capital has a positive and significant effect on Sustainable Competitive Advantage, so hypothesis 2 is accepted.

3. The third hypothesis has a significance value of t-value = 1.831, p-value = 0.034, and path coefficient = 0.271, meaning that 27.1% of Dynamic Capabilities have a positive effect on sustainable competitive advantage. Therefore, hypothesis 3 is accepted.

4. The fourth hypothesis has a significance value of t-value = 1.822, p-value = 0.034, and path coefficient = 0.272, meaning that only 27% of intellectual capital has a positive effect on Sustainable Competitive Advantage through Dynamic Capabilities. Therefore, hypothesis 4 is accepted.

6. Discussion

6.1. Analysis of the Effect of Intellectual Capital on Dynamic Capabilities

The findings from the first hypothesis indicate that intellectual capital can enhance dynamic capabilities. Intellectual capital refers to the capacity of higher education institutions (HEIs) to effectively handle intangible assets and generate intellectual assets in various aspects of higher education, including the Tri Dharma principle, internal and external relationships, and collaboration among HEIs. This is done with the aim of enhancing the competence of lecturers, educational staff and students and ultimately contributing to the development, progress and success of organizations in effectively managing intellectual assets. The potency of intellectual capital plays a crucial role in shaping the dynamic capabilities of Higher Education Institutions (HEIs). Dynamic capabilities refer to the ability of HEIs to effectively monitor the external environment, identify changes, and subsequently reorganize their resources to adapt, integrate, coordinate and rejuvenate these resources to advance the Tri Dharma of HE and

governance. Higher Education Institutions. The Human Capital dimension is characterized by highly competent employees (lecturers and education staff) who excel in their respective fields. This is supported by sufficient employees and their ability to effectively contribute to problem solving. They are also adept at updating business process methods and efficiently allocating resources based on standard management practices. Additionally, successful coordination in Tri-Dharma HEIs is achieved.

According to experts, intellectual capital is evaluated on the basis of a company's human resources. Human resources refers to employees' combined skills and abilities to address stakeholders' challenges (Mohammed et al., 2020; Storey, 2016). The development of dynamic talent is greatly influenced by intellectual capital. The components of intellectual capital, including human, social, and organizational capital, have a significant impact on the development of dynamic capacities, as indicated by prior research. Social and organizational capital exert an impact on the assimilation and restructuring of corporate assets, enabling them to expand in tandem with market fluctuations (Singh & Rao, 2016a). The results of this research confirm those of previous studies that found that intellectual capital has a significant impact on dynamic capabilities (van Reijssen et al., 2015; Aminu & Mahmood, 2015; Singh & Rao, 2016a; Thanh Nhon et al., 2020; Salma & Anwar Muhammad, 2021; Ali et al., 2021).

6.2. Analysis of the Effect of Intellectual Capital on Sustainable Competitive Advantage

The findings of H2 indicate that Intellectual Capital has the capacity to enhance Sustainable Competitive Advantage. The findings of this study indicate that human capital refers to the competence of employees that is sufficient and capable of contributing to problem-solving, supported by structural capital. It is crucial for every employee to have a clear understanding of the regulations, job descriptions, guidelines, and procedures for implementing the Tri Dharma of Higher Education (education, research, and community service). This leads to the formation of organizational effectiveness, characterized by high professionalism in the management of Private Higher Education Institutions (PHEIs) and innovation in the implementation of the Tri-Dharma HEIs for sustainable growth of PHEIs. However, good employee productivity is also essential to support these outcomes. Organizational responsiveness is crucial for the success of PHEIs because it enables them to adapt to technological developments and meet the interests of stakeholders and target consumers. The Quality Education component is the most significant aspect of Sustainable Competitive Advantage, where PHEIs possess a curriculum of

exceptional quality that adheres to both national and international standards for education and training. The reason this dimension receives the highest value is effective management of Intellectual Capital.

Chaka (2023) suggested that AI-powered chatbots could be used to help students learn and study how well chatbots work in areas where AI is known to have problems, such as outsourcing teaching, AI-assisted chatbots less frequently interacting with humans, and a lack of cognitive tutors. The university recognizes that its real value increases with the unique intellectual capital it possesses and is able to improve performance and develop the services it offers, which helps increase its competitive capabilities. Chen et al. (2015) stated that companies with high intellectual capital are more competent in innovating and improving their performance. Researchers have revealed that organizational sustainability can be maintained by developing intellectual capital (Chung et al., 2016; Peñalba-Aguirrezabalaga et al., 2020; Subramanian & van de Vrande, 2019). Martín-de-Castro et al. (2011) explained that the Intellectual Capital-Based View (ICV) found in the internal typology is human capital, structural capital, spiritual capital, and technological capital, while in the external typology it is relational capital, social capital, and customer capital. According to de Bem Machado et al. (2024), the use of information and communication technology in pedagogy has become widespread. As a result, digital education that incorporates mobile technology is becoming a global trend. The aim is to identify primary digital pedagogies employed in higher education, enabling institutions to determine the most impactful approaches. This will enable them to effectively utilize technology to enhance their knowledge and develop future professional competencies. Previous research suggests that the influence of intellectual capital has a significant impact on sustainable competitive advantage in higher education (Indiyati, 2018; Anggraini et al., 2018; Abu-Rumman, 2018; Iqbal et al., 2019; Qassas et al., 2021) and in the telecommunications sector (Kanaan et al., 2020).

6.3. Analysis of the Effect of Dynamic Capabilities on Sustainable Competitive Advantage

The findings of the third hypothesis demonstrate a statistically significant relationship, suggesting that dynamic capabilities exert influence on the attainment of a sustainable competitive advantage. Dynamic capabilities are derived from the abilities of PHEIs to monitor the environment, identify and exploit opportunities and reconfigure resources to adapt, integrate, coordinate and renew resources in the face of dynamic changes in their internal and external environments. These capabilities contribute to the advancement of the Tri Dharma of Higher Education and

the governance of PHEIs. The determinant dimension of Dynamic Capabilities, specifically coordination, is crucial. PHEIs must possess the capacity to allocate resources effectively for each activity that promotes successful implementation of coordination in Tri Dharma Higher Education. Additionally, they should enhance standard management by using suitable information systems to attain a sustainable competitive advantage. In the dimension of organizational excellence, there exists a favorable level of interaction among employees (including lecturers and educational staff) who possess both expertise and competence and demonstrate mutual respect for each other's willingness to embrace change. This harmonious collaboration is aimed at attaining the organization's vision, mission, and goals.

The researchers consider the significance of this study in relation to the proposition model proposed by Apascari et al. and Elvira (2022). This model combines Strategic Human Resource Management (SHRM) and the Dynamic Capabilities Framework (DCF) to enhance the understanding of the relationship between HRM and performance. The results also serve as a catalyst for future research on the underlying mechanisms. Organizations operating in a fast-paced, dynamic environment can strengthen their strategic agility in terms of change and disruption by using a three-pronged approach to human resource management (HRM). This approach includes knowledge-building, social integration, and reconfiguration-enhancing capabilities, which enable organizations to leverage synergies between HRM resources and capabilities. In their study, Yang et al. (2023) emphasized the significance of organizational competencies in achieving strategic flexibility through adaptation to external factors, including emerging technology, customer demands, and market volatility.

The study conducted by Hube et al., (2022) cites multiple experts, including Duncan (1972), who argued that dynamic capabilities can be seen as small "external gears" located just outside the main gear of an organization. These capabilities are influenced by the external environment, which extends beyond the organizational boundaries. According to Morgan (1997), the Cogwheel Model of Dynamic Capabilities (CMDC) was proposed. This model explains the level of turbulence that an organization experiences both internally and externally using two interlocking gears. This creates a multiplier effect. Hube et al. (2022) created the Cogwheel Model of Dynamic Capabilities (CMDC) to explain and examine the dynamic processes of DC in a university environment that has undergone significant and unpredictable changes. The research findings in this study validate earlier research that asserts a strong and meaningful correlation between dynamic talents and durable competitive advantage in

the context of higher education sector (Sriwidadi et al., 2016; Elayan & Sleimi, 2021), in the ICT sector (Gyemang & Emeagwali, 2020; Thanh Nhon et al., 2020), in the banking sector (Ali et al., 2021), and (Gutierrez-Gutierrez & Antony, 2020) for the Systematic Literature Review (SLR).

6.4. Analysis of the Effect of Intellectual Capital on Sustainable Competitive Advantage Mediated by Dynamic Capabilities

The research findings from H4 indicate that Dynamic Capabilities can act as mediators in the interaction between Intellectual Capital and Sustainable Competitive Advantage. The strength of Intellectual Capital and the optimization of Dynamic Capabilities are key factors that influence the attainment of sustainable competitive advantage at PHEIs. In this research model, Dynamic Capabilities can be considered a partial mediator because it has both direct and indirect positive and significant influences. However, the coefficient of the direct influence of Intellectual Capital on Sustainable Competitive Advantage is greater than the influence mediated by dynamic capabilities. In PHEIs, the dimension coefficient value that is highest in intellectual capital is structural capital. This refers to the use of regulations, procedural manuals, job descriptions, and organized reporting channels in PHEIs. By enhancing human capital, specifically the competence of employees such as lecturers and education staff, they can effectively contribute to problem-solving. However, it is crucial to acknowledge that this dimension, which encompasses the number of employees, requires optimization because it currently has the lowest average value. Special attention must be given to customer capital difficulties because they have the lowest average score in terms of market share. To maintain and enhance the reputation and satisfaction of stakeholders with the academic services provided by PHEIs, it is crucial to focus on improving relational capital. Relational capital, as a dimension of intellectual capital, plays a significant role in establishing and nurturing interpersonal relationships based on commitment. These relationships extend to government employees, customers, and other important stakeholders. This concept was discussed by Pedro et al. (2018).

Dynamic Capabilities play a crucial role in gaining competitive advantage for private universities. This advantage is reinforced by the Innovation dimension, which requires careful consideration. It is worth noting that research findings on this dimension have had a negative impact on the overall competitive advantage, as well as the average score for the provision of facilities. To foster employee creativity, it is necessary to enhance the innovation skills of PHEIs, which will ultimately lead to improved performance. Based on the research findings, it can be concluded that Public Higher

Education Institutions (PHEIs) have the capacity to adapt their techniques, policies and decisions to effectively govern themselves, making them distinct organizations in the field of PHEI governance. Some researchers exploit the competitive advantage of mediating variables to enhance the associations described (Zhou et al., 2019; Khourouh et al. (2020). Moreover, Wendra et al. (2019) and Engelman et al. (2017) emphasized that the diverse dynamic capabilities discussed in earlier empirical investigations have varying impacts on the status of intellectual capital. The dimensions analyzed in this study offer a broader scope, as they encompass 7 dimensions of Intellectual Capital that were previously seldom explored and studied together in various research models examining the connection between Intellectual Capital, Sustainable Competitive Advantage, and Dynamic Capabilities. The findings of this hypothesis support previous studies that have indicated a strong and positive relationship between Intellectual Capital and Sustainable Competitive Advantage, with Dynamic Capabilities acting as a mediator (Scafarto et al., 2016; Engelman et al., 2017; S. Choi et al., 2018; Thanh Nhon et al., 2020).

Moreover, these research findings strengthen DC mechanism of Hube et al. (2022) in PHEIs and CII model proposed by Gutierrez-Gutierrez and Antony (2020). The researcher believes a strategy for holistically integrating tasks in each work area by allocating resources appropriately for each activity and implementing quality standard management techniques between units using effective methods and information system control mechanisms is needed. PHEI's Tri Dharma HEI strategic programs and actions include space and communication to integrate policies with holistic knowledge.

7. Conclusion

Research indicates that DC's direct or indirect impacts on SCA are significant. IC and DC were added to the CII paradigm by the researcher. By examining IC in the context of dynamic capacities that aid the ongoing improvement and lasting competitive advantage, this study addresses a research gap. Additionally, it investigates a new higher education SCA paradigm. To determine the route coefficient, this study uses higher-order construct modeling (HCM), which quantifies the contribution of dimensions to each variable and shows their superiority. The study also examines the contextual elements and indicators of IC, DC and SCA in PHEIs. Operationalizing sensing means that the university can monitor and recognize external developments and produce service innovations. To accelerate adaptation and sustainable development, Tri Dharma HEIs must reconfigure with stakeholders.

To achieve competitive excellence, PHEI must strive to effectively create learning innovation, be moral and

professional and strive to improve the university's reputation so that it can grow and be productive sustainably. Additionally, the university consistently responds to the needs of students, government policies, stakeholder interests, and competitiveness. With an optimal support force, the university can foster creative and innovative ideas among its employees, thereby recognizing and appreciating innovation in services and facilities, as well as developing new innovation management strategies. Therefore, the potential and competitiveness of HE can be demonstrated by the potential strength of the resources they have, namely, the expertise of leaders, lecturers, academic support staff and their facilities.

8. Limitations and Future Research

This research has limitations, including the fact that the generalization of the results is only applicable to the leadership sample, whose population is relatively small at only 10 private universities in Indonesia. Future research could be extended to other private higher education areas in wider areas. Second, this research only discusses three determinant variables that affect the sustainable competitive advantage of private universities. From reviewing a lot of literature, there are other factors that are important as determinants, such as strategic leadership, strategic human resources management, market orientation, balance scorecards, reputation and legitimacy, collaboration with industry, and organizational learning capabilities. Third, the constellation of research models can be arranged into one research model. Future research can create a research model for the variables studied as moderation or reversing the direction of the relationship, which of course requires references to relevant theory and research. Fourth, the research object is limited to the education sector, that is, private universities. Future research could propose education sectors at other levels, for example, in private high schools and state universities and in industrial sectors other than education.

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Conflicts of Interest

The authors declare no conflicts of interest.

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