KnE Social Sciences

ICESRE
6th International Conference on Education and Social Science Research
Volume 2024

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Research Article

Intellectual Capital Management as a Strategic Asset of Higher Education in Improving Organizational Performance

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Abstract.
Higher education involves various kinds of science that develops and produces reliable human resources in the field of science. Higher education performance is primarily determined by the leadership's ability to manage knowledge-based strategic assets, namely intellectual capital. This research designs all elements that form intellectual capital, such as human capital, structural capital, and relational capital, in one model according to their organizational function. The research aims to optimize the role of intellectual capital as a strategic asset for higher education to improve organizational performance. This is a survey research, where data were obtained by distributing questionnaires to higher education leaders in Surabaya, both State Higher Education (SHE) and Private Higher Education (PHE). The research produced a model for managing intellectual capital, where human capital and structural capital are independent variables for higher education performance. In contrast, relational capital is a mediator for both. The research results can guide higher education leaders in managing intellectual capital as a strategic asset determining organizational performance.

Keywords: human capital, structural capital, relational capital, organizational performance

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Published 12 March 2024

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the ICESRE Conference Committee.

1. Introduction

This research places higher education not only as a non-profit organization established by the government or private sector that aims to make the nation's life more intelligent but also as a service company that operates in the field of science and aims to develop science and produce reliable resources in the field of science [1]. By placing higher education in a different context, the performance measurements discussed in this research also use different indicators. Suppose the government uses accreditation rankings as a measuring tool for evaluating higher education performance. In that case, this research uses the Triple Bottom Line (TBL) concept by aligning the achievement of organizational goals in the economic, social, and environmental fields [2]. In the

TBL philosophy, there is a logical conclusion about the role of three types of capital in determining organizational performance: economic capital, natural capital, and social capital. Efforts to build sustainability will help organizations equalize the importance of these three types of capital and integrate them in every aspect of organizational life [3].

An analytical approach called Recourse Based Theory (RBT) emphasizes the role of resources in organizational growth [4]. The RBT theory was pioneered by Edith Penrose in 1959 in the book "Theory of the Growth of the Firm" *which* suggests that organizational resources are heterogeneous, not homogeneous. Productive services from resources will give each organization a unique character [5]. Academics agree that Penrose's ideas were the momentum for the birth of Recourse Based Theory (RBT), which regulates strategic steps for company leaders in improving organizational performance. Productive services from resources will give each organization a unique character [6]. This is the reason for management to understand the types of strategic assets and their management as an asset that determines organizational performance.

To identify higher education strategic assets, this research assumes that all assets originating from knowledge are intangible strategic assets that will provide added value to the organization to improve performance. The role of higher education as a knowledge-based organization in which various kinds of knowledge are developed [7], as well as producing reliable human resources in the field of science [8], is the reason for establishing "knowledge-based assets" as strategic assets for higher education. There are four models of measuring knowledge as an intangible asset, namely (1) Human Resource Accounting, (2) Economic Value Added, (3) The Balanced Scorecard, and (4) Intellectual Capital [9]. This research chooses one measurement model, Intellectual Capital (IC) because IC includes value-creation factors that cannot be shown on traditional balance sheets but are very important for long-term performance [10]. The knowledge measurement model through Intellectual Capital is very suitable to be applied to this research because universities where research is conducted, do not publish balance sheets or financial reports as a tool for measuring organizational performance.

Applying intellectual capital in organizational governance is a management effort oriented towards collecting empirical evidence to deepen intellectual capital's potential roles in the value creation process [11]. Empirical evidence explains that intellectual capital influences the organization's performance now and in the future. The importance of intellectual capital in improving the performance of organizational responsibility practices oriented towards increasing intangible resources has been proven to produce better organizational performance in the long term [12]. The relationship between intellectual capital and organizational performance is realized by improving corporate

reputation and image and supporting technological innovation [13]. Flexibility, speed, innovation, and integration require human resources full of creativity, while creativity itself can emerge from human resources who have excellence in science [14].

As proven by researchers, intellectual capital's importance in improving performance raises fundamental problems in managing intellectual capital in organizations. Intellectual capital cannot be calculated or analyzed as increasing or decreasing, so its involvement in determining organizational performance is complex to explain [15]. Intellectual capital can only be known through changes in the creativity and innovation of the employees where he works. Intellectual capital is challenging to implement because, first, it requires sufficient skills to overcome the gap between intellectual capital as a scientific discipline and its function in organizations; second, instability in the professionalism of the workforce; and third, the high volume of immeasurability knowledge so that it is not easy to transfer and exploit by all members of the organization [16].

Discussions about managing intellectual capital in an organization to improve performance are very complex [17]. Many experts argue that the contribution of Intellectual Capital in achieving an organization's strategic goals can only be achieved if organizational managers can prioritize the scarce resources they have [18]. The practice of intellectual capital is not carried out by managers as much as is stated by academics [19]. This condition ultimately gives rise to the need to understand what an organization can use to maximize its intellectual capital role in improving long-term performance [20]. Leaders with managerial intelligence are needed to solve organizational problems innovatively based on science and apply knowledge through managerial activities [21–23].

Intellectual capital can provide new resources for an organization to improve performance, even though it is sometimes difficult to understand [24]. The elements of intellectual capital consisting of human, structural, and relational capital must be carried out simultaneously and influence each other [25]. Furthermore, a concept of the Intellectual Capital Maturity Model (ICMM) in higher education, including the value of intangible assets that are attached to the individual (Human Capital), those that are attached to the organization (structural capital), and the ability of both to produce value for the organization. If you look closely at this concept, this research places human capital and structural capital as independent variables for improving performance, while relational capital is a mediator for both [26].

Based on this description, this research aims to analyze the relationship between elements of intellectual capital, as shown in the conceptual framework in Figure 1.

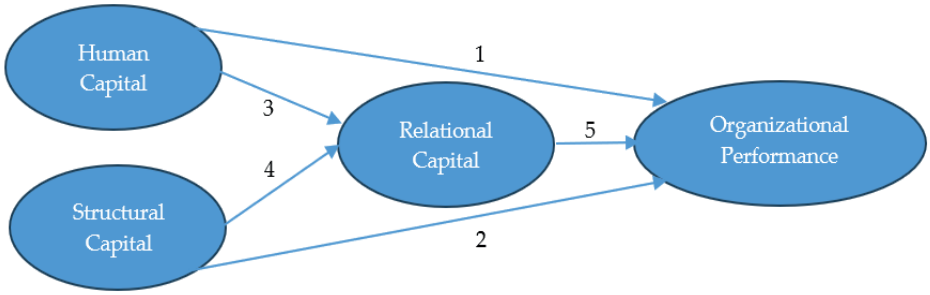

Figure 1: Conceptual Framework.

The hypothesis developed is:

1. H1: Human capital has a direct effect on organizational performance
2. H2: Structural capital has a direct effect on organizational performance
3. H3: Human capital has a direct effect on relational capital
4. H4: Structural capital has a direct effect on relational capital
5. H5: Relational capital has a direct effect on organizational performance
6. H6: Relational capital increases the magnitude of the influence of human capital on organizational performance
7. H7: Relational capital increases the magnitude of the influence of structural capital on organizational performance

2. Method

This explanatory research analyzes the relationship between variables and explains the influence between variables through hypothesis testing—the variables in Table 1. The population in this study were all universities in Surabaya, consisting of 6 State Higher Education (SHE) and Private Higher Education (PHE). Samples were determined using the saturated sample technique. Data was collected by distributing questionnaires to 69 higher education leaders and then analyzed using the path analysis technique. The results, which are described in Table 3, 4, and 5, with a general explanation of the table, are Totally Disagree (TD), Don't Agree (DA), Neutral (N), Agree (A), and Strongly Agree (SA).

Table 1: Research Variables.

Variable Type	Variable Names & Operational Definitions	Indicator
Independent	Human Capital It is an intangible asset attached to the individual (lecturer) and of value to the organization.	Educational qualifications Functional Learning innovation Work experience Communication skills
	Structural Capital It is an intangible asset inherent in the organization and of value to the organization.	Teaching process Research process Dedication process Organizational structure
Intervening	Relational Capital It is an organization's ability to produce added value using human and structural capital.	External collaboration Quality of service Organizational culture
Dependent	Organizational Performance The ability of universities to produce tri-dharma outcomes.	Alignment of social capital Alignment of economic capital Environmental capital alignment

Table 2: Description of Human Capital Variables.

No.	Statement	TD	DA	N	A	SA	Average
1	The more lecturers with doctoral qualifications, the better the image of the institution.	5	7	10	50	41	4.02
2	A lecturer's functional position is directly related to his ability to carry out the tri-dharma duties.	2	5	20	40	46	4.09
3	Innovation is needed to increase students' understanding of learning material.	5	7	10	56	35	3.96
4	Lecturers' work experience is very determining in improving performance.	2	4	7	45	55	4.30
5	Lecturers must be able to communicate their programs with all components of the University.	6	7	12	41	47	4.03
	Variable Score						4.08

Note: Score average = {(TDx1)+(DAx2)+(Nx3)+(Ax4)+(SAx5)}/69

3. Result and Discussion

Table 2 explains that the human capital variable score is categorized as good as a higher education performance factor with an average value of 4.08 points. Among all the indicators measured, work experience gets the maximum response in measuring the value of human capital. These results can be interpreted to mean that the substance of lecturers' performance is not only a matter of academic ability but also their experience in guiding students, learning skills, research abilities, and the extent of their network.

Table 3 explains that the role of structural capital as a variable that shapes organizational performance is categorized as good, with an average score of 4.02 points. Among all indicators measuring structural capital, it is known that the most significant

Table 3: Description of Structural Capital Variables.

No	Statement	TD	DA	N	A	SA	Average
1	Higher education has an adequate learning system.	7	7	13	45	41	3.94
2	The research process is carried out systematically, starting from proposing proposals to reporting.	5	10	10	53	35	3.91
3	The community service process is carried out following the needs of the village community and is coordinated with village officials.	6	6	7	41	53	4.14
4	All employees understand their duties and authority well.	2	5	12	41	53	4.22
5	All officials know the duties of their position and to whom they must be responsible.	8	10	18	30	47	3.87
Variable Score							4.02

Note: Score average = {(TDx1)+(DAx2)+(Nx3)+(Ax4)+(SAx5)}/69

value is obtained from organizational culture. The value of harmony the spirit of helping each other in completing work positively impacts organizational performance.

Table 4: Description of Relational Capital Variables.

No.	Statement	TD	DA	N	A	SA	Average
1	Universities prioritize student satisfaction with academic services.	3	6	6	40	58	4.27
2	Universities collaborate with government and private institutions.	2	4	12	45	50	4.21
3	Universities provide maximum service to graduate users.	6	9	12	39	47	3.99
4	The entire academic community builds cooperation in their daily work.	5	10	22	35	41	3.86
Variable Score							4.08

Note: Score average = {(TDx1)+(DAx2)+(Nx3)+(Ax4)+(SAx5)}/69

Table 4 explains that the relational capital variable has an excellent contribution to determining organizational performance, with an average score of 4.08 points. The most significant indicator in this variable is service satisfaction for students. The existence of students as the main stakeholders in higher education management should receive primary attention from higher education administrators, starting from leaders, lecturers, and educational staff. The service satisfaction felt by students will spread to the community quickly and accurately, thus having an impact on organizational performance.

Table 5 explains that the average score of the organizational performance variable is 3.98 in the excellent category. This value means that the use of the triple bottom line concept, which carries the concept of harmony between social capital, economic capital,

Table 5: Description of Organizational Performance Variables.

No.	Statement	TD	DA	N	A	SA	Average
1	All employees have the opportunity to improve their quality according to their competence.	2	5	20	40	46	4.09
2	Universities manage finances transparently and accountably.	8	10	18	30	47	3.87
3	Universities maintain a clean and healthy environmental quality.	6	7	12	41	47	4.03
4	A reward and punishment system is provided as a form of appreciation for employee performance.	5	10	10	53	35	3.91
Variable Score							3.98

Note: Score average = {(TDx1)+(DAx2)+(Nx3)+(Ax4)+(SAx5)}/69

and environmental capital in measuring organizational performance, is well received by respondents. Among the three types of capital, the social mode is the one that occupies the highest rank in determining organizational performance. This can be proven by the significant score of the statement that employees are given extensive opportunities to develop themselves according to their competencies. The variable coefficient values listed in the functional relationship between variables are presented in Table 6.

Table 6: Path Analysis Coefficient Values.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Information
HC -> OP	0.314	0.316	0.078	2.478	0.035	Significant
SC -> OP	0.698	0.627	0.079	11.297	0.000	Significant
HC->RC	0.395	0.400	0.085	2.875	0.016	Significant
SC -> RC	0.582	0.557	0.052	3.843	0.004	Significant
RC -> OP	0.649	0.702	0.088	8.842	0,000	Significant
HC -> RC -> OP	0.427	0.498	0.082	6.452	0.011	Significant
SC -> RC-> OP	0.063	0.069	0.041	1.587	0.173	Not significant

3.1. The Direct Influence of Human Capital on Organizational Performance

This research proves that human capital directly affects organizational performance with a variable coefficient of 0.314 and is significant at 0.035 (0.035 < 0.05). Thus, H1, which states that human capital directly influences organizational performance, is accepted as true. All indicators used as measuring tools for human capital consist of educational qualifications, functional positions of lecturers, learning innovation, work

experience, and communication skills, which are proven to reflect the value of human capital. Lecturers with a doctoral education qualification have wider opportunities to advance their careers in education; this also applies if the lecturer has a functional position of at least a lecturer and is experienced in their field. All the competencies inherent in lecturers allow lecturers to be more innovative in designing learning media. If supported by good communication skills, students will feel the positive impact directly so that organizational performance increases.

3.2. The Direct Influence of Structural Capital on Organizational Performance

This research proves that structural capital directly affects organizational performance with a variable coefficient of 0.698 and is significant at a value of 0.000 (0.000 < 0.05). With a t statistic value of 11.297, the role of the structural capital variable in determining organizational performance is vast. Thus, H2, which states that structural capital directly affects organizational performance, is accepted as true. Learning processes that are integrated with the academic system, as well as research and service processes that are designed systematically, have a positive impact on organizational performance. Universities guarantee that the research and service process is carried out systematically and responsibly, namely preparing proposals accompanied by templates according to the scheme, implementation is monitored and evaluated, reporting is scrutinized, and promised outcomes must be fulfilled. The entire process is outlined in the research and service SOP, accompanied by the appointment of the institution or unit responsible for carrying it out.

3.3. The Direct Influence of Human Capital on Relational Capital

This research proves that human capital directly affects relational capital with a variable coefficient of 0.395 and is significant at a value of 0.016 (0.016 < 0.05). Thus, H3, which states that human capital directly affects relational capital, is accepted as true. Relational capital indicators consist of service quality, external cooperation, and organizational culture requiring the role of human resources who are competent in their fields. To form an excellent organizational culture, services to stakeholders, especially students, can be carried out well if they are professional and supported by good communication skills. Meanwhile, collaboration with external parties requires a vast network of connections,

3.4. The Direct Influence of Structural Capital on Relational Capital

This research proves that structural capital directly affects relational capital with a variable coefficient of 0.582 and is significant at a value of 0.004 (0.004 < 0.05). Thus, H4, which states that structural capital directly affects relational capital, is accepted as true. Understanding the entire academic community to carry out their duties and functions well results in an excellent organizational culture, which will ultimately provide maximum service to students and other stakeholders. Implementing the Tridharma program is carried out systematically according to the SOP, opening up opportunities for collaboration with external parties. For example, collaboration to bring in practitioners as guest lecturers in lectures, research and service resource persons,

3.5. The Direct Influence of Relational Capital on Organizational Performance

This research proves that relational capital directly affects organizational performance with a variable coefficient of 0.649 and is significant at a value of 0.000 (0.000 < 0.05). Thus, H5, which states that relational capital directly affects organizational performance, is accepted as true. The ability of higher education institutions to provide excellent services to all institutional stakeholders, especially students, directly impacts organizational performance. Students who feel satisfied with academic services make it easy for lecturers to provide learning materials, participate in the research process, and actively participate in community service. All of this certainly impacts the alignment of social capital and the environment for higher education. Real impact: students will convey their feelings of satisfaction to those closest to them so that they have promotive value for higher education. This causes the number of students to increase, and economic capital is realigned.

3.6. The Role of Relational Capital in Mediating The Influence of Human Capital on Performance

This research proves that relational capital can mediate the influence of human capital on organizational performance with a variable coefficient of 0.427 and is significant at a value of 0.011 (0.011 < 0.05). The mediation coefficient value is greater than the direct effect, 0.314 (0.427 > 0.314). Thus, H6, which states that relational capital increases the influence of human capital on organizational performance, is accepted as true. These results prove that cooperation and service quality built by reliable human resources can

improve organizational performance. The competence of human resources (especially lecturers) can harmonize social capital, economic mode, and environmental capital, which is suitable for the institution's development.

3.7. The Role of Relational Capital in Mediating The Influence of Structural Capital on Performance

This research proves that relational capital cannot mediate the influence of structural capital on organizational performance. The resulting variable coefficient value is 0.063 and is significant at 0.173 (0.063 > 0.05), where the mediation coefficient value is smaller than the direct effect, namely 0.698 (0.063 < 0.968). Thus, H7, which states that relational capital increases the influence of structural capital on organizational performance, is rejected as true. The direct influence between structural capital and organizational performance is very high, so this does not make other variables act as mediators. Relational capital does not have a high influence of structural capital on organizational performance.

4. Conclusion

This research resulted in the conclusion that (1) Human capital has a direct effect on organizational performance, (2) Structural capital has a direct effect on organizational performance, (3) Human capital has a direct effect on relational capital, (4) Structural capital has a direct effect on relational capital, (4) Relational capital has a direct effect on organizational performance, (5) Relational capital increases the influence of human capital on organizational performance, (6) Relational capital does not increase the influence of structural capital on organizational performance.

The research results are helpful theoretically and practically. Theoretically, the research results can provide an understanding that the elements that form intellectual capital have a functional relationship with one another. This can be conveyed to students in studying strategic management courses. Meanwhile, practical benefits can be gained by higher education leaders in maximizing the role of intellectual capital to improve organizational performance.

Acknowledgements

We want to express our gratitude to the leadership of PGRI Adi Buana Surabaya University for providing the opportunity and research costs to create research output in the form of scientific articles that are ready to be published in the proceedings of the ICESRE international seminar organized by PGRI University Semarang.

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