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# Impact Assessment of Intellectual Capital on Value Creation in Higher Education

*Summary*

In the realm of higher education, the pivotal role of intellectual capital in fostering value creation has become increasingly pronounced. Intellectual capital, encompassing the collective knowledge, skills, and innovative capacities of individuals within academic institutions, serves as a catalyst for transformative advancements in education and beyond. As the global landscape evolves with rapid technological and societal changes, the significance of intellectual capital in shaping the trajectory of higher education has never been more crucial. This article delves into the multifaceted dimensions of intellectual capital and its profound impact on value generation within the sphere of higher education. By exploring the intricate interplay between knowledge acquisition, innovation, and institutional development, we aim to illuminate the dynamic and evolving nature of intellectual capital as a driving force behind the continual evolution and enhancement of higher education. Based on the changes observed in organizational/institutional value creation, this literature review deals in detail with the need for conscious, effective and efficient management and development of intellectual capital, which is inconceivable without real and reliable information about the resources subject to management.

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## Introduction

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Education makes a significant contribution to the economic development of a nation, whether developing or developed. One of the most important resources for economic development is human capital, that is, national labour. Quality education is necessary to ensure a productive workforce that leads to sustainable economic growth of a nation and a welfare society.

The measurement and integration of intangible resources into organizational governance is one of the most discussed topics in today's management literature, which is of intense interest to those interested in the management of organizations/institutions. Opinions are strongly divided on the practical relevance of the topic, but there is no doubt that the study of the role of intellectual capital in competitiveness and in the value creation of corporate or, even further, higher education institutions is one of the most popular areas of economic and management research today. The measurement and integration of non-tangible resources into organizational management represent one of the most extensively discussed topics in contemporary management literature, capturing the attention of leaders and scholars alike. This area of inquiry addresses the challenge of quantifying and strategically incorporating intangible assets, such as knowledge, skills, and organizational culture, into the overall management framework. Organizations and institutions keen on effective leadership find themselves immersed in exploring methodologies to assess and leverage these non-material resources, recognizing their pivotal role in achieving sustained competitive advantage. As the dynamic business landscape continues to evolve, the discourse on measuring and incorporating non-tangible resources remains at the forefront of managerial considerations, shaping the strategies employed by organizations to optimize their operational efficiency and long-term success. Based on the changes observed in organizational/institutional value creation, this literature review deals in detail with the need for conscious, effective and efficient management and development of intellectual capital, which is inconceivable without real and reliable information about the resources subject to management.

## Resource-based approach

Over the past 25 years, the resource-based approach has received prominent attention in the literature. A series of studies laid the intellectual foundations of this approach, which emphasized the different resource pools of heterogeneous companies and sought to answer the question of why some companies are constantly able to outperform others. The foundations of resource-based thinking are rooted in Ricardo economics, Penrose's (1959) theory of corporate growth, Selznik's (1957) research on distinctive competence, and Rubin's (1973) work on company expansion.

Deciphering questions of economic growth brought questions of value and income distribution to the attention of Ricardo (1772-1823), Malthus (1766-1834) and Marx (1818-1882). According to Ricardo, the goal of economics is to determine objective income relations. They focused their investigations on the supply side, emphasizing the role of inputs, primarily labour, in setting prices. Therefore, the value theory of classical economists is called labour value theory (Farkasné Fekete – Molnár, 2007).

Several researchers have attempted to define and characterize resources (including Wernerfelt,

1984; Barney, 1999; Mahoney – Pandian, 1992; Kapás, 1999), however, it can be said that, as in the whole field of resource-based viewing, this is a concept where there is quite a lot of terminological confusion. They refer to potential sources of benefit such as „resource", „competences", „abilities", „dynamic abilities", „tools", „activities", „asymmetry" or „knowledge" according to each author's approach to the resource and which gives value to each study (Kapás, 1999; Barney – Arikan, 2001).

The neoclassical view, significantly narrowing the range of resources, included land, labour and capital. Penrose (1959) went beyond this view to see the enterprise as an ensemble of productive resources, thereby significantly expanding the understanding of resources. Later, many authors grouped resources according to different criteria, which were also influenced by different interpretations. Due to terminological confusion, some authors have distinguished between resource and ability (Teece et al., 1997; Grant, 1991; Amit – Schoemaker, 1993), while others also classified ability as a resource (Barney, 1991; Peteraf, 1993; Black – Boal, 1994; Kapás, 1999). Amit and Schoemaker (1993), for example, have broken down the concept of resources into resources and capabilities. In their interpretation, resources are marketable and not specific to the company (e.g. know-how, financial and physical assets, human capital), while capabilities are company-specific and allow resources to be exploited.

Scholars and practitioners alike have extensively explored and applied the principles of the resource-based view to enhance organizational performance and foster long-term success in dynamic business environments.

*Penrose's theory*

The creator of the resource-based view (RBV) is considered to be Edith Penrose (1959), who recognized the importance of resources for the competitive position of companies. In his book, The Theory of the Growth of the Firm, he sees the company as an interchangeable set of resources organized by the company within an administrative framework. It argues that these resources contribute to companies' competitive position to the extent that companies exploit them in such a way as to make potentially valuable services available to the company. He recognized the importance of individual behavior and learning and identified managerial barriers as one of the main barriers to corporate growth.

Penrose distinguishes two types of knowledge: „objective" knowledge and experience. Objective knowledge is „independent of the individual or group" and „acquired by all on equal terms". He calls the second form of knowledge „experience." Experience, as well as objective knowledge, increases the productivity of the use of material and human resources, but cannot transmit it. According to Penrose, „Experience alone can never be transmitted; it brings about a change–often only a small change–in individuals and cannot be separated from them" (Pitelis – Wahl, 1998).

The theory's strengths lie in its emphasis on internal capabilities, unique resources, and dynamic capabilities as sources of sustained competitive advantage, providing a comprehensive framework for strategic management. However, criticisms have emerged regarding the RBV's challenges in offering clear guidelines for resource identification and its potential to overlook external factors. Despite these critiques, the resource-based view remains an influential perspective in strategic management, guiding organizations in leveraging their distinctive competencies for long-term success.

## Competence

Organizational structure defines organizational learning. Competencies evolve within an organization and are not solely reducible to individual capabilities. They stem from the dynamic interactions and collaborations among members, reflecting the collective expertise, shared values, and synergies that characterize the organizational culture. The development of competencies is intricately tied to the social and collaborative aspects of the work environment, emphasizing the role of teamwork, knowledge sharing, and organizational learning. Recognizing that competencies extend beyond individual skills underscores the importance of fostering a supportive and collaborative organizational culture to nurture and enhance collective capabilities. A bad organizational structure makes organizational learning and the development of new competencies impossible (Kapás, 1999).

The growing importance of emotion and attention needs to be carefully considered for both market operation and organizational behavior. A certain group of emotions takes the form of competency requirements and become important factors for labour market processes or corporate functions, such as performance appraisal.

Further studies in higher education are needed in the dynamic abilities theory of Teece et al. (1997), which seeks to answer the question of how a company or institution can build and integrate competencies in a rapidly changing environment. According to Kapás (1999), both practical and theoretical effects of resource-based enterprise theory are significant. One way to solve problems is to open up strongly to evolutionary economics. This claim is supported by the fact that both evolutionary and resource-based theories start from the recognition of heterogeneity of companies/institutions.

## The concept of intellectual capital

The word capital comes directly from the Latin word capitale, an adjective corresponding to the noun caput, meaning head. It originally refers to the main part of the debt, distinguished from interest. Over the centuries, the meaning of the word has expanded, interest-bearing amounts of money were considered capital, but all kinds of other collections of wealth were considered capital, they could be combined as the embodiment of interest - that is, „money at work" (Andriessen, 2004).

Numerous studies show that traditional resources (such as machines, tools, production equipment, or financial resources alone) are no longer the most valuable factor of production, but rather intangible resources (such as human resources, partnerships, brand, and efficient organizational structure), often called intellectual capital. However, the conscious management of the latter, non-objectified factors is by no means an easy task (Harangozó, 2012).

It can be stated that, despite the popularity of the topic, in practice there has not been a uniform name and definition for intangible strategic resources, also called intellectual capital. Many people call and define the concept in many ways. In the management literature, intellectual capital is most often understood to mean those resources that do not have material-physical or monetary manifestations, but are valuable to the company. Gu and Lev, emphasising the role of context, add that intangible resources do not necessarily have value

in themselves, but become so by participating in the value-creating processes of the company. The authors consider research and development (R+D), marketing and advertising activities, as well as the HR and IT practices of the company to be the most important drivers of intangible values (Gu – Lev, 2001). According to another definition, intellectual capital is defined as the assets of a company that are based on knowledge. This approach highlights organizational (internal) characteristics such as the knowledge and experience of employees, organizational processes or the information system.

Among external factors, brand equity and customer trust are emphasized (Brennan – Connell, 2000). A similar definition is given by Pfeil when he defines intellectual capital, based primarily on the work of Edvinsson and Sullivan, as knowledge that can be transformed into value (Pfeil, 2004). *RICARDIS*, a research project supported by the Commission of the European Union, which investigated the role of knowledge capital in research-oriented small and medium-sized enterprises, defines intellectual capital as the human, organisational and relational capital of an organisation and a combination of related activities (Ricardis, 2005). Last but not least, Kaplan and Norton – the two fathers of a balanced strategic scorecard – define intangible resources as the sum total of employees' ability to meet customer needs. In their approach, intellectual capital can be understood as knowledge in the form of human (skills, talent), information (information systems, knowledge applications, infrastructure) and organizational capital elements (culture, leadership, coordination, teamwork) that exists in the organization in order to create a distinctive (strategic) advantage for the organization (Kaplan – Norton, 2005).

Since the above definitions are too general to apply in practical life, many studies have implemented the definition of the content of intellectual capital by listing and describing its components.

One of the most well-known such definitions is Sveiby's categorization, in which the author classified the basic elements of intellectual capital into the following three groups (Sveiby, 2001a, 2001b):

Human capital. It contains knowledge, skills and competencies of employees. Human capital is thus closely linked to the person: it comes when employees enter, and when they leave, it is lost to the organization.

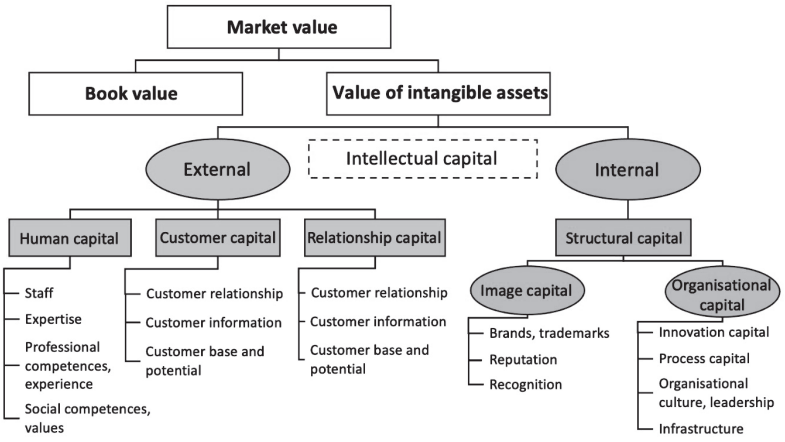
Structural capital (internal structure). These include, for example, organizational processes, routines, operating models, IT and information systems, but also the corporate culture itself. These factors are also created by employees and are usually owned by companies. The internal structure and people together make up the organization.

Relationship capital (external structure). The external structure captures the relationships established with customers and suppliers and their quality, but also includes the brand name, trademarks and the reputation and image of the company. Although the list of definitions could go on, when viewed from the perspective of basic capabilities and resource-based theories, intellectual capital can be understood as a whole, the resources of an organization without material manifestations, which participate in value creation and are connected in some way to knowledge. Thus, intellectual capital can be considered knowledge that can be converted into value (or strategically fundamental ability), closely related to the participants

in the organization (human capital), its processes and structure (structural capital), and its relationship with the buyer and procurement markets (relational capital).

Figure 1. provides a comprehensive picture of the elements of intellectual capital and illustrates the performance measurement and accounting challenge of knowledge capital management: How to measure and monitor the creation of value by intellectual capital and the development of the value of knowledge capital on a regular basis if accounting systems provide very little information on intangible resources that is suitable for future-oriented management decision support.

*Figure 1. Key components of value and intangible strategic resources*




*Source: Stoi, 2003*

Thus, it can be concluded that whether in a higher education institution or an organization, it is difficult to create intellectual capital based on knowledge without an appropriate information system.

The investment of time and money in studies is called human capital investment (Farkasné Fekete – Molnár, 2007).

As entities involved in the creation and dissemination of knowledge, higher education institutions are increasingly taking on a form of entrepreneurial role, including networking and international cooperation, and increasingly focus on critical issues of sustainability and social change (Frondizi et al., 2019).

Many higher education institutions have begun to incorporate sustainable development practices into their institutional structures and have developed a wide range of sustainability assessment tools to support institutions in their systematic measurement, monitoring, benchmarking and communication efforts (Findler et al., 2018).

Future research opportunities can be exploited by creating studies that focus on human capital.

It would also be advisable to deepen the scarce knowledge of intellectual capital in higher

education institutions, contrasting the ideas of maintainers and students regarding the different activities taking place in this knowledge institution. Knowledge institutions of this type are those that play a significant role in educating proactive citizens in terms of sustainable development and quality of life, with a clear social vision (Matos Pedro et al., 2020).

*Measuring intellectual capital*

Taking into account the processes taking place in organizations and their environment (e.g. the growing gap between the market and book value of companies, the increasing level of intellectual capital investment, the results of numerous empirical studies on knowledge management, etc.), it can be seen that intangible resources are one of the most important sources of value creation in today's organizations. Therefore, their conscious, effective and efficient measurement and development, as well as their inclusion in organizational management, are in many cases the basic conditions for gaining and maintaining competitiveness. However, in order to manage any resource effectively, the first step is to take stock of that resource, assess its current situation, and compare the results obtained with the expected future trends, which is also true for intellectual capital.

*Scorecard as a tool for measurable intellectual capital*

Due to the prominent role of intangible assets in value creation and the lack of accounting information, various management tools have appeared in the management literature in connection with the accounting of intellectual capital. According to Sveiby's widespread categorization, these can be classified into the following four main groups based on the underlying methodology of measurement (Sveiby, 2002):

- Direct Intellectual Capital (DIC) methods break down intellectual capital into elements and evaluate each part separately in monetary terms;
- Market Capitalization Methods (MCM) define intellectual capital as the difference between a company's market value and its book value;
- Return on Assets (ROA) models divide a company's average pre-tax income by the average value of tangible assets and then estimate the value of intellectual capital by capitalizing returns above the industry average;
- Scorecard-type systems (SC) define separate indicators for describing the stock of individual intellectual property, with the help of which the stock of intellectual property and its changes are also presented. A characteristic feature of the models included is that their primary purpose is not to determine monetary value. Thus, a common feature of these methods is that they do not seek to express intellectual capital and its individual elements in monetary terms, but quantify the intellectual capital of the company using various indicators. Rather than monetary valuation, their aim is:
- monitoring changes in intellectual capital, presenting them in a structured form;
- more efficient organisational use and management of intangible resources;
- mobilising the human, structural and information resources at their disposal;
- identification of strategically critical knowledge elements;
- organisational knowledge management and development of the necessary intangible

assets and capabilities;
- increasing competitiveness and supporting value creation along causal logic (Harangozó, 2007).

In their empirical study, Ittner and Larcker argue that the harm from the misuse of non-financial indicators may outweigh the benefits they can achieve. Examining the practical implementation of management tools aimed at measuring intangible resources, the authors identify the following four main problems (Ittner – Larcker, 2004):
- lack of link between indicators and strategy;
- failure to confirm cause-effect links;
- failure to set correct performance targets;
- incorrect measurement lacking statistical validity and reliability.

It can be seen, therefore, that measuring intellectual capital is not an easy task. However, due to the role of intangible resources in creating organizational value, their management and thus measurement is essential.

In 2001, Becker et al. introduced the HR scorecard. By applying the four perspectives of the balanced scorecard[1] (finance, customers, operational processes, and learning development), the HR scorecard has become a tool that connects people with strategy and performance.

The authors write that HR managers are best able to take the most effective action to provide strategic input to the development of a measurement system that convincingly demonstrates the impact of human resources on business performance (Becker et al., 2001). The authors argue that there is a causal relationship between people and their activities. Strategic goals allow us to understand how intellectual capital creates a sense of value (Marr, 2005).

## Conclusion

Thinking within the framework of a higher education institution, we should not ignore the need for cooperation between functional areas and the availability of management information.

Intellectual capital becomes valuable when the head of the higher education institution knows what are the most important and truly unique resources - who are the key knowledge carriers - in the organization and is able to mobilize them effectively. The head of a higher education institution becomes a managerial manager if he concentrates the human resources at his disposal primarily on those tasks where participants can make the most use of their existing knowledge.

Success in a higher educational institution depends on the ability of people to adapt to the fast rhythm along the lines of assimilation of modern strategies. The most important change that can be expected in higher education, and especially in higher education institutions, is the consideration of human value: a qualitative improvement in people's attitudes, values, beliefs and feelings.

This article explores the value-creating role of intellectual capital in higher education,

tracing its trajectory from the development of competencies within the organizational context. Beginning with the recognition that competencies emerge collectively within an institution, the article delves into the seminal work of Edith Penrose, whose theory emphasized the strategic importance of resources in shaping a firm's competitive position. The discussion progresses through the lens of the resource-based view, which highlights the significance of unique organizational resources and capabilities in achieving sustained competitive advantage. Drawing parallels between Penrose's insights and the resource-based view, the article establishes a theoretical foundation for understanding the intricacies of intellectual capital in the realm of higher education. It underscores how intellectual capital, encompassing know-ledge, skills, and innovative capacities, serves as a crucial resource within academic institutions.

As the narrative unfolds, the article navigates through the challenges of measuring non-tangible resources, shedding light on the complexities involved in assessing intellectual capital. It emphasizes the intensifying importance of incorporating methodologies for the effective measurement of intangible assets within the higher education landscape. Ultimately, the article aims to contribute to the ongoing discourse on the dynamic interplay between competencies, organizational theories, and the measurement of intellectual capital, offering insights that resonate with leaders and scholars invested in the continual enhancement of higher education institutions.

## Notes

[1] The balanced scorecard (BSC) is a strategic management tool (framework). In English it is called the balanced strategic scorecard, but in practice it is also used in the UK. Its importance lies in the linking of strategic management and control, whereby other perspectives and non-financial indicators are used in addition to financial ones. The tool has become extremely popular because of its simplicity, clarity and its answers to substantive management problems.

## Bibliography

Amit Raphael – Schoemaker Paul J. (1993): Strategic Assets and Organizational Rent, *Strategic Management Journal*, 14: pp. 33-46

Andriessen Daan (2004): *Making Sense of Intellectual Capital* ISBN: 0-7506-7774-0: p. 60

Barney Jay (1991): Firm Resources and Sustained Competitive Advantage, *Journal of Management*, 17 (1): pp. 99-120

Barney Jay (1999): How a Firm's Capabilities Affect Boundary Decisions. *Sloan Management Review*, 40: pp. 137-145

Barney Jay – Arikan Asli (2001): The Resource-Based View: Origins and Implications, in *Blackwell Handbook of Strategic Management*, Malden, M.A.: Blackwell Publisher Inc.: pp. 124-188

Becker Brian E. – Mark A. Huselid – David Ulrich (2001): The HR scorecard: Linking people, strategy, and performance. *Harvard Business Press*

Bernard Marr (2005): Perspectives on Intellectual Capital ISBN: 0-7506-7799-6: p.150

Birger Wernerfelt (1984): A Resource-Based View of the Firm, *Strategic Management Journal*, 5 (2): pp. 171-180

Black Janice A. – Kimberly B. Boal (1994): Strategic resources: Traits, configurations and paths to sustainable competitive advantage, *Strategic management journal* 15.S2, pp. 131-148.

Brennan Niamh M. – Brenda Connell (2000): Intellectual Capital: current issues and policy implications. *Journal of Intellectual Capital*, Vol. 1, No. 3.: pp. 206-240

Chris Pitelis – Michael. W. Wahl (1998): Edith Penrose: Pioneer of Stakeholder Theory Long Range Planning Vol. 31

David J. Teece – Gary Pisano – Amy Shuen (1997): Dynamic Capabilities and Strategic Management, *Strategic Management Journal*, 18: pp. 509-533

Edith Penrose (1959): The Theory of the Growth of the Firm (1995 ed.), *New York: John Wiley and Sons*

Eugénia de Matos Pedro – João Carlos Correia Leitão – Helena Alves (2020): Bridging Intellectual Capital, Sustainable Development and Quality of Life in Higher Education Institutions, *Sustainability*

Farkasné Fekete Mária – Molnár József (2007): *Mikroökonómia* Debreceni Egyetem Agrár- és Műszaki Tudományok Centruma Agrárgazdasági és Vidékfejlesztési Kar Debrecen, 2007. ISBN 978-963-9732-59-9: p. 221

Feng Gu – Baruch Lev (2001): *Intangible assets - measurement, drivers, usefulness*. Boston University and New York University

Florian Findler – Norma Schönherr – Rodrigo Lozano – Barbara Stacherl (2018): Assessing the Impacts of Higher Education Institutions on Sustainable Development-an Analysis of Tools and Indicators. *Sustainability*: p. 11, 59

Harangozó Tamás (2007): Az intellektuális tőke mérése és ennek lehetséges magatartási vonatkozásai *Vezetéstudomány*, XXXVIII. évf. 2007. 12. szám: p. 34

Harangozó Tamás (2012): Az erőforrás-alapú megközelítés a gyakorlatban - Az intellektuális tőke, mint alapvető képesség forrása? *Vezetéstudomány*, XLIII. évf. 2012. 7-8. szám: pp. 57-67

Ittner Cristopher D. – David F. Larcker (2004): A nem pénzügyi jellegű teljesítménymérés hiányosságai, *Harvard Businessmanager* 16-13.

Joseph T. Mahoney – J. Rajendran Pandian (1992): The Resource-Based View Within the Conversation of Strategic Management, *Strategic Management Journal*, 13: pp. 363-380

Kapás Judit (1999): Egy új vállalatelmélet: erőforrás-alapú megközelítés - Összefoglalás és diagnózis, *Vezetéstudomány*, 30 (2): pp. 35-43

Karl-Erik Sveiby (2001a): A knowledge-based theory of the firm to guide in strategy formulation. *Journal of Intellectual Capital*, Vol. 2, No. 4: pp. 344–358

Karl-Erik Sveiby (2001b): *Szervezetek új gazdagsága: a menedzselt tudás*. KJK-Kerszöv, Budapest

Karl-Erik Sveiby (2002): Methods for Measuring Intangible Assets. http://www.sveiby.com/Portals/0/articles/IntangibleMethods.htm

Margaret A. Peteraf (1993): The Cornerstones of Competitive Advantage: A Resource-Based View, *Strategic Management Journal*, 14: pp. 179-191

Oliver Peter Pfeil (2004): *Earnings from Intellectual Capital as a Driver of Shareholder Value.* Haupt Verlag AG, Bern

Paul H. Rubin (1973): The Expansion of Firms, *Journal of Political Economy*, 81 (4): pp. 936-949

Philipp Selznik (1957): *Leadership in Administration: a Sociological Interpretation*, New York: Harper & Row

Ricardis (2005): Reporting Intellectual Capital to Augment Research, *Development and Innovation in SMEs*. End-Report, Introduction & Part 1, Version July 15 th

Robert M. Grant (1991): The Resource-Based Theory of Competitive Advantage: Implication for Strategy Formulation, *California Management Review*, Spring: pp. 114-133

Robert S. Kaplan – David P. Norton (2005): *Stratégiai térképek. Hogyan alakulnak át az immateriális javak pénzügyi eredménnyé?* Budapest: Panem Kiadó

Rocco Frondizi – Chiara Fantauzzi – Nathalie Colasanti – Gloria Fiorani (2019): The Evaluation of Universities' Third Mission and Intellectual Capital: Theoretical Analysis and Application to Italy. *Sustainability*: p. 11, 3455

Roman Stoi (2003): Management und Controlling von Intangibles auf Basis der immateriellen Werttreiber des Unternehmens. in Horváth, P. – Möller, K. (szerk): Intangibles in der Unternehmenssteuerung, Verlag Franz Vahlen, München: pp. 187-202