

BIBLIOMETRIC ANALYSIS TOWARD TO INTELLECTUAL CAPITAL ON SMALL MEDIUM ENTERPRISES (SMES)

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ABSTRACT

This study determines the development trend of Intellectual Capital research in SMEs published by leading journals indexed by Scopus by identifying key authors, keywords, journals that publish in IC and MSMEs and countries that write a lot of research related to it. The data analyzed consisted of 266 research publications from 1998-2020 using the VoS viewer application to discover the intellectual Capital research development bibliometric map. The findings suggest that there are two major theories related to intellectual capital in technology-based SMEs, namely resource-based view and knowledge base view, which support and complement each other

Keywords: Intellectual Capital, Customer Capital, Structural Capital, Human Capital, SMEs, Bibliometrics, VoS Viewer

I. INTRODUCTION

The advancement in knowledge based economy means physical resources alone cannot be considered as competitive advantage (Fathi et al., 2013). Many large companies have run a knowledge-based business. According to Ernst & Young (2006), 60% of the workers are knowledge workers in developed countries like the US. It is proven by increasing this knowledge capability. Companies can carry out activities more effectively and efficiently (Hernandez and Nurozi, 2010). However, the obstacle is that a clear identification does not match the importance of this knowledge in the traditional financial statements that exist today. According to Rahardian and Meiranto (2011),

many company investments in intangible assets cannot be found on the balance sheet due to limitations in the accounting criteria for the recognition and valuation of these assets. One approach in valuating intangible assets that is important for companies is intellectual capital (Intellectual Capital / IC).

Small and medium enterprises are an interesting topic to study, considering their strategic role in driving the national economy, especially from job opportunities and sources of income for the poor (Tambunan, 2014). According to data (BPS, 2018), the contribution of SMEs to GDP reaches 60.34% while the number of small and medium-sized enterprises reaches approximately 99.88% of the total business units in Indonesia and can absorb around 96.66% of the workforce. SMEs have also proven to be more resilient than medium and large enterprises

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in the face of the Indonesian economic crisis in 1998.

Looking at the condition of SMEs (Small and Medium Enterprises) in Indonesia, it seems that not many people are aware of the importance of knowledge-based business by optimizing their intellectual capital, even though the existence of SMEs is expected to exist in growing the economy have high competitiveness. This is because SMEs are one of the industrial sectors that provide the largest contribution to the economic growth. Likewise, the existence of SMEs in Indonesia as a sector with an important role and can survive the crisis that hit the Indonesian economy. By optimizing the existing intellectual capital, SMEs are expected to face competition and be able to develop over time along with the development of science and technology (Widiastuti, 2013).

Intellectual Capital is not visible in the company's financial statements (balance sheet) but is considered a strategic asset (investment) and is seen as important for companies in increasing the value and performance of the company on an ongoing basis. SMEs need to understand their management strategy as the main asset that can build a company's competitiveness. Bataineh and Al Zoaby (2011) regard intellectual capital as skills, knowledge, and technology that offer companies competitive advantage. SMEs need knowledge and information to improve company performance to participate in today's competitive market.

Intellectual capital is also knowledge gained from value of firm (Fathi et al., 2013). According to Shiddiq (2013), intellectual capital is not a replacable asset because it cannot be imitated, producing a lasting competitive advantage and improving company performance. Meanwhile, Intellectual Capital (IC), according to Pramudita (2012), is useful knowledge that is packaged as "packaged useful knowledge". It is explained that it includes organizational processes, technology, patents, employees, skills, expertise and information about customers, suppliers and stakeholders.

Intellectual Capital consists of the company's main elements, which include human capital, structural capital and relational capital, which are considered to be able to improve the company's business performance (Cerrato & Viva, 2012; Hejazi et al., 2016; Onkelinx et al., 2016; Marvel et al., 2016; Jogaratnam, 2017; Chowdhuri et al., 2019; Kalique et al., 2020) and maintain competitive stability with other companies (Shiddiq, 2013). Therefore, intellectual capital is considered a competitive advantage that is difficult to imitate by its competitors and irreplaceable (Barney, 1991) and can increase the value and financial performance of the company.

The bibliometric provides a consistent, and objective research with strong quantitative analysis that makes it more reliable (Farrukh et al., 2020). It has expanded the ways of doing research in many fields with the help by offering a systematic approach to locate themes and changes in ongoing areas of research. Additionally, it helps identifying popular authors, institutions and countries of respective research fields (Farrukh et al., 2020; Zupic & Cater, 2015).

Bibliometric techniques are used in this study to determine how the intellectual capital literature in the MSME sector continues to develop. This technique also allows providing direction, structure and form of research that is increasingly advanced and developing. Research using bibliometrics can also be used to analyze articles and citations used by previous researchers. This study aims to identify and evaluate the impact of articles, relationships and significant contributions related to intellectual capital in the MSME sector.

This research analyzes research papers to identify popular issues, research trends and developments using 266 research publications published during the period 1998-2020. It has used the VoS viewer to discover the intellectual Capital research development bibliometric map. The next arrangement in this study consists of section 2, discussing a comprehensive review of intellectual capital literature. Section 3 describes the methods used to carry out bibliometric studies, while section 4 describes the analysis and discussion. Section 5 is the findings of the results. Section 6 is the conclusion and limitations.

II. LITERATURE REVIEW

Intellectual Capital

Many other authors have documented and described the importance of IC as a major intangible assets (Carlucci et al., 2004; Sharabati et al., 2010). Ferreira and Franco (2017) narrate that intellectual capital is human, structural and relational capital. The model developed by Lowendahl (1997) in Hong (2007) develops the previous model with several modifications and divides competence and relationships into two sub-groups, namely individual and collective. Stewart (1997) categorizes intellectual capital into human, structural and customer capital. Hong (2007) revealed The Danish Confederation of Trade Unions (1999), which grouped Intellectual Capital into People, System and Market Resources. Intellectual Capital is briefly described as follows:

a) Human Capital

Intellectual capital is actually the human resource (Edvinsson and Malone, 1997; Stewart, 1997; Bontis, 1998; Choo and Bontis, 2002; Nazarpouri, 2016). Roos et al. (1997) narrates that intellectual capital is generated by employees through their competencies, agility, attitude and creativity in the company. Competence is actually education, ability and skill, while attitude consists of portions of behavior of an employee towards work. Higher intellectual agility means higher ability of employees to solve problems.

The Skandia model identifies how important human capital is towards the growth of an organization. What this model actually refers is the intellectual capital that depends on capability to seek knowledge collectivity. In other words human capital actually means intellectual capital (Schultz, 1961). This makes intellectual capital an important resource and a capability to act on knowledge. Abdol mohammadi (2005) identifies positive relationship between disclosure of intellectual capital and market capitalization in 53 Fortune 500

companies.

Drucker (1993) argues land, labor and capital the organizational resources that matter for organizational success. But now, intellectual capital resources are also important resources. Even without intellectual capital, existing resources will be more meaningful. Hence, an organization must be encouraged to change its strategy from labor to knowledge based.

b) Structural Capital

According to Bontis (1998) limited systems preclude full potential of intellectual capital. Strong structural capital urges organisations for innovations in their work. Structural capital is actually a set of tools and architecture (Cabrita and Bontis, 2008). Structural capital is sometimes protected by laws and functions as intellectual property rights (Starovic and Marr, 2004 in Astuti, 2005).

In this regard, structural capital has two objectives that must be achieved. First, codify transferable knowledge. This is done so that the system is not lost. Second, connecting employees with data, experts and expertise (Sugeng, 2000). Structural capital is a system inside an organization that helps employees learn from each other in the best possible way for the betterment of an organisation. In the modern age organisation means value stemming from physical and non physical resources possessed by an organization.

c) Customer Capital

Customer capital is actually knowledge from business networks flowing into the organisations (Nahapiet and Ghosal, 1998 in Bataineh and Zoaby, 2011; Delgado-Verde et al., 2011; Subramaniam and Youndt), 2005; Ferenhof et al., 2015; Inkinen, 2015). Customer capital also includes knowledge stemming from stakeholders of organization. Therefore, customer capital is knowledge about marketing and customer relations. It improves relationships that brings new customers (Montequin et al., 2006 in Alipour, 2012).

III. RESEARCH METHODS

Use of bibliometric techniques is getting popular in business studies in the present era (Wu et al., 2021). This is because it summarizes the contributions of authors, journals and publishers in a particular area of interest. Therefore in order to meet its objectives, this research collects manuscripts from various journals published between 1998 to 2020 on the theme of Intellectual Capital in SMEs. Collection of data has been carried out by collecting manuscripts that are published in journals indexed in Scopus database. The manuscripts have been collected using the keywords "Intellectual Capital" and SMEs that yielded 294 upto 2021.

The academic year data was collected from January to December, so the authors processed only 266 articles from 1998-2020. Data has been analyzed using Microsoft Excel 2010 and VOSViewer software. The process of data collection and processing were explained below:

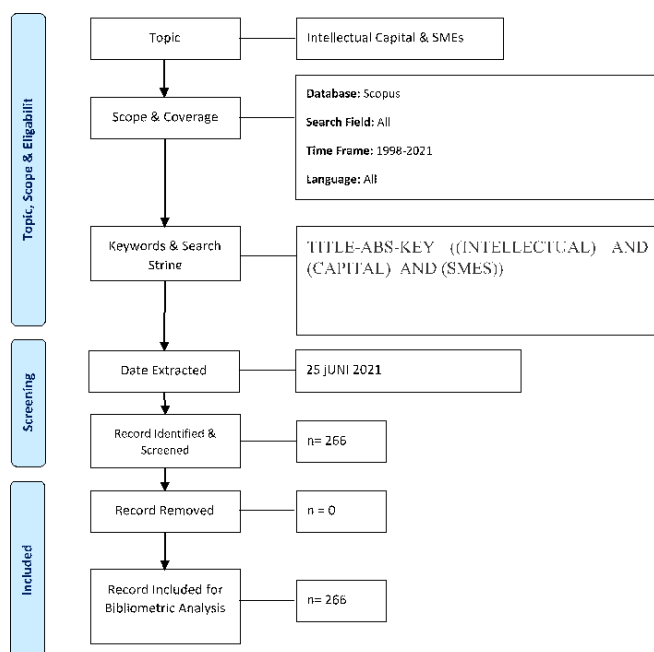


Figure 1. Diagram of data collection and processing using bibliometric

IV. RESULTS AND DISCUSSION

Intellectual capital literature has developed from year to year. The highest point for international publications was in 2019 with 33 articles and slightly down in 2020 with the number of articles of 31 documents. Publications related to intellectual capital have been started since 1998.

Number of types of intellectual capital literature documents

Table 1 hereunder shows documents used in research with the theme of Intellectual Capital in accounting and management research.

Table 1.
Document Types

| No | Type | Number |
|--------------|-------------------|------------|
| 1 | Journal | 170 |
| 3 | Conference Paper | 63 |
| 3 | Book chapter | 15 |
| 4 | Conference Review | 7 |
| 5 | Review | 6 |
| 6 | Book & editorial | 4 |
| 7 | Erratum | 1 |
| TOTAL | | 266 |

The pie chart details are based on a grouping by type

Figure 2. Presentation of intellectual capital literature document types

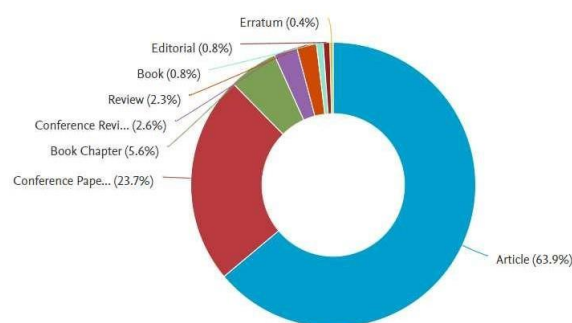


Figure 2. States that journal articles are widely used for research on Intellectual Capital.

Bibliometric Graph Analysis

This section presents visual mapping of 266 manuscripts published on the theme of intellectual capital. Mapping helps identify knowledge elements, their configuration, interactions, dynamics and interdependencies by developing a landscape of topics (Royani et al., 2013). Network visualization from 266 articles on various aspects of intellectual capital have been given hereunder:

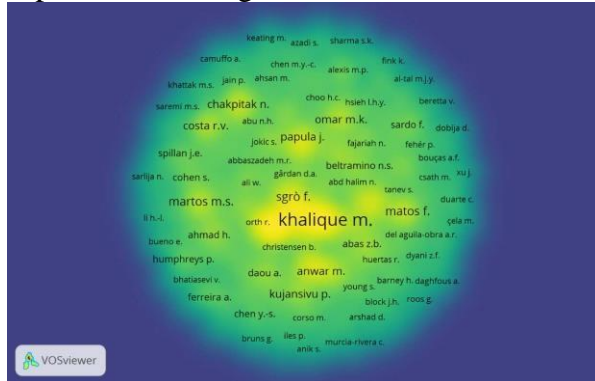
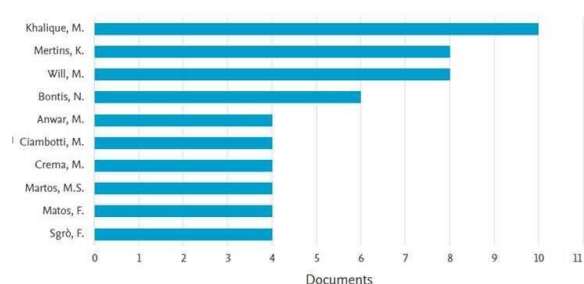


Figure 3. Bibliometric Author Mapping

In the figure 3 cluster density is determined from the brightness of yellow light. The density of yellow color depends on item to item association. The map identifies the authors that have the most number of publications. Figure identified Khaliq M., as the most published author on intellectual capital.

Here are the results of article categorization based on the top 10 names that often appear.



Bibliometric Institutions Mapping

Figure 4 identifies the most popular institution that has contributed on the topic of intellectual capital during the period under review of this bibliometric analysis.

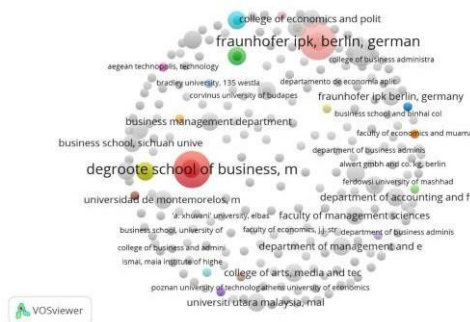


Figure 4. Bibliometric Institutions Mapping

The figure has been calculated based on the publications produced and links established. The bigger circles in the figure shows the institutions that have contributed most on Intellectual Capital in SMEs. The figure shows that DeGroote School of Business, McMaster University, Hamilton, Canada are the leading institutions in this regard.

Documents by affiliation

Compare the document counts for up to 15 affiliations.

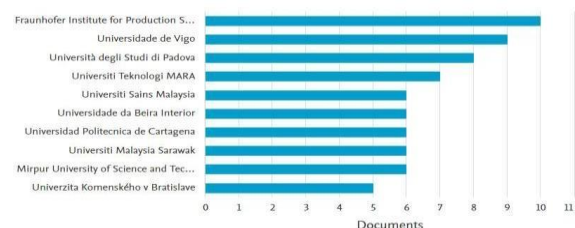


Figure 5. Document by Affiliation

Bibliometric Country Mapping

Visualization of country has been explained in figure 6 hereunder. The figure shows several clusters how the most prominent cluster is lead by Spain and Malaysia who have produced research papers on intellectual capital in SMEs. The same information has been explained in figures 7 as well.

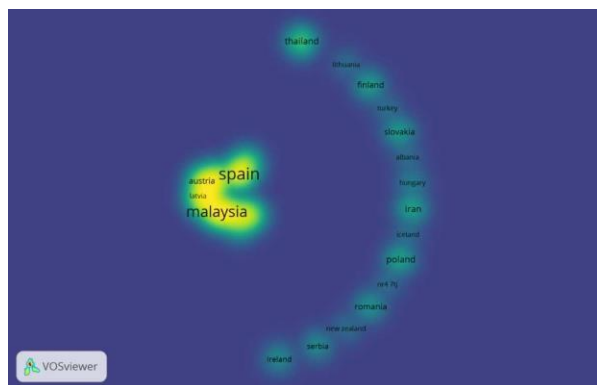


Figure 6. Bibliometric Country Mapping

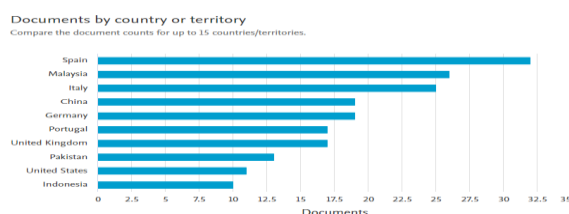


Figure 7. Document by country

Bibliometric Keyword Mapping

Figure 8 displays visualization of widely used keywords in research on intellectual capital in SMEs.

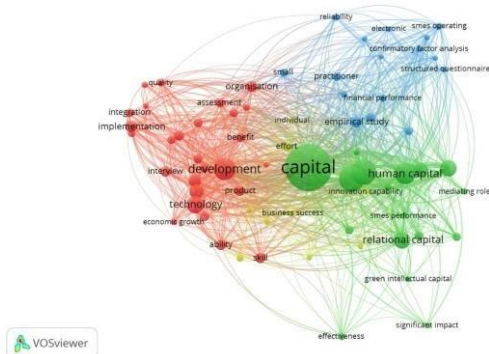


Figure 8. Bibliometric Keyword Mapping

The cluster of keywords has been explained hereunder:

- Cluster 1 in red consists of 28 keywords: Ability, Action, Assessment, Benefit, Change, Critical Success Factor, Development, Economic Growth, Government, Human Resource, Implementation,

Integration, Intellectual Capital Management, Intellectual Capital Statement, Intellectual Property, Interest, Interview, Market, Nation, Opportunity, Organization, Product, Productivity, Quality, Requirement, Service, Skill, Technology.

- Green Cluster 2 consists of 17 keywords: Business Performance, Capital, Effectiveness, Film Performance, Green Intellectual Capital, Human Capital, Influence, Mediating Role, Performance, Positive Relationship, Profitability, Relational Capital, Relationship, Significant Impact, SMEs Performance, Structural Capital, Sustainable Competitiveness.
- Cluster 3 in blue consists of 16 keywords: Confirmatory Factor Analysis, Customer Capital, Electronic, Empirical Study, Existence, Financial Performance, Future Research, Multiple Regression Analysis, Organizational Performance, Policy Maker, Practitioner, Reliability, Small, SMEs Operating, Social Capital, Structured Questionnaire.
- Cluster 4 yellow consists of 9 keywords: Business Success, Effort, Empirical Investigation, Entrepreneurship, Individual, Innovation Capability, Intellectual Capital Perspective, Medium, Organization Capital.

Bibliometric Index Mapping

Figure 9 shows bibliometric index that shows relationship between intellectual Capital and its relation to management accounting. Where the same color of two indices means close relationship.

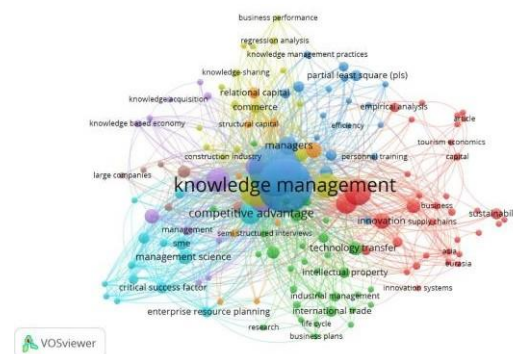


Figure 9. Bibliometric Index Mapping

Figure 9 shows that Intellectual Capital related to management accounting, several words are most widely used, namely Knowledge Management, followed by the word Intellectual Capital.

FINDINGS

The importance of intellectual capital can not be ignored for gaining competitive advantage in SMEs based on Khalique's research. It can be achieved by utilizing knowledge efficiently (Jardon & Martos, 2012; Massaro et al., 2015; Mertins et al., 2006). Performance-based on intellectual capital is a determinant of competitive advantage in MSME companies. Companies can achieve significant competitive advantage by mobilizing IC through knowledge, technological skills, experience and strategic competencies (Kamukama & Sulait 2017).

Based on previous studies, at least 2 major theories related to Intellectual Capital, namely Resource-Based View (RBV) and Knowledge-Based View or Knowledge-Based Theory (KBT). The first theory was developed by Penrose (1959), while the second theory was widely developed by Grant (1996). These two theories have become the basis for research and studies on intellectual capital both in the SMEs industry and other industries in general.

The theoretical basis for the resource-based view (RBV) for companies is based on resource development (Penrose, 1959). The development of these resources includes skills and abilities that contribute to competitive advantage. This theory was then continued by Wernerfelt (1984) and reinforced by Barney (1991), stating that companies can create competitive advantages in the market through their internal resources.

In understanding the sources of sustainable competitive advantages, building a theoretical model that starts from an assumption is necessary. This assumption explains that the company's resources are heterogeneous and immobile (Barney, 1991). Further, to become a potential resource in

sustained competitive advantages, the company's resources must have 4 attributes, including (a) valuable resources, (b) rare resources, (c) imperfectly imitable resources), (d) unavailability of substitute resources (non-substitutability resources).

Company resources are declared valuable when they are used for strategy implementation to produce effectiveness and efficiency. Meanwhile, resources are said to be rare if these resources are not owned by other companies, especially competing companies. The company will be able to implement its strategy by having resources with these 4 attributes. Competitor companies will not do the same because they do not have the resources to implement the strategy. This shows that scarce and valuable resources will be a source of sustainable competitive advantage.

Competitors cannot achieve a competitive advantage if they do not have and cannot obtain these resources. In other words, competing companies cannot imitate the strategy and cannot imitate the resources needed to implement the strategy. Three important factors make companies a difficult resource to imitate: unique historical conditions, casual ambiguity, and complex social systems. In addition to being valuable, rare, and difficult to imitate, resources that produce competitive and sustainable advantages must also have characteristics that cannot be substituted. This means that competing companies do not have equivalent resources as substitutes in implementing their strategies, even though companies have valuable, unique and difficult to imitate resources. Still, if competitors have equivalent substitutes, these resources are no longer a source of competitive and sustainable advantage.

The second major theory that underlies the development of the concept of intellectual capital is Knowledge-Based Theory or known as KBT. In this theory, Grant (1996) and Spender (1996) argue that alliances are formed as a source of learning. Kale & Singh (2007) argue that previous alliances help form future alliances. Knowledge-based theory (Grant, 1996; Nonaka, 1994; Grant and Baden-Fuller, 2004) considers strategic alliances & intellectual capital as the most capable resource to generate sustainable competitive advantage. Strategic alliances enhance learning and knowledge sharing (Jiang et al., 2016). This theory identifies mutual trust and commitment to success (Muthusamy & White, 2005). In addition

(Nghah, 2011) argues that knowledge sharing is strongly influenced by the dimensions of intellectual capital consisting of relational capital, human capital and structural capital. Among the three dimensions, it shows that human capital as the dimension of intellectual capital most influences knowledge acquisition and knowledge transfer. (Seleim, 2011).

Indeed, based on the literature that the author has reviewed, the first theory (RBV) is relatively early and is more widely used as the basis for developing theories related to intellectual capital. Meanwhile, the second theory (KBT), which is based on learning, tends to be less used to develop theories related to intellectual capital. However, in its development, this second theory is even more relevant lately, especially concerning the growth of industry 4.0, which increasingly requires a lot of knowledge, so that industrial development becomes mature and full of innovation. Based on the data processing results, the following is a summary of research findings related to keywords, the most prolific authors and institutions that have researched a lot on intellectual capital.

Table 2.
Summary of research findings

| Rank | Keyword by Occurrence | Authors with The Highest Publication | Affiliation |
|------|-----------------------|--------------------------------------|---|
| 1. | Intellectual Capital | Khalique M. | DeGroote School of Business, McMaster University, Hamilton, Canada |
| 2. | Knowledge Management | Will M. | Fraunhofer IPK, Berlin, Germany |
| 3. | SMEs | Mertins K. | Faculty of Economics and Business, Universiti Malaysia Sarawak, Sarawak, Malaysia |

| | | | |
|-----|-----------------------------------|--------------|--|
| 4. | Competition | Bontis N. | Business Administration Department, National Yunlin University of Science and Technology, Taiwan |
| 5. | Innovation | Ciambotti M. | Accounting and Finance Department, Athens University of Economics and Business, Athens, Greece |
| 6. | Human Capital | Sgro F. | Management and Engineering department, University of Padua, Vicenza, Italy |
| 7. | Small and Medium-Sized Enterprise | Crema M. | Department of Business Management, Polytechnic University of Cartagena, Cartagena, Spain |
| 8. | Relational Capital | Martos MS. | Nottingham Trent University, Nottingham, United Kingdom |
| 9. | Structural Capital | Matos F. | Business School, Sichuan University, Chengdu, China |
| 10. | Sustainable Development | Jardon C.M. | Intangible Assets Consulting, Graz, Austria |

V. CONCLUSIONS AND LIMITATIONS

Using 266 research papers published between 1998 to 2021 this study endeavors to determine the development of the concept of intellectual capital in SME's. Bibliometric mapping visualization shows that it is Khalique M. who writes the most about Intellectual Capital in SMEs. The institution with the most publications on Intellectual Capital are the DeGroote School of Business, McMaster University, Hamilton, Canada. The with the most publications on intellectual capital is Spain.

This study suffers from the limitation that it only analyzes manuscripts based on bibliometric information from articles, not on the in-depth content of each research. Even so, the author assumes that the keywords already represent the content of the entire article.

Implications from this study are for academics that intellectual capital requires more research in the area of SMEs in such a way that human capital of an organization have deep roots in intellectual capital. Intellectual capital is in fact an asset that has roots in education, personality, experience, exposure, training and interactions of an employee during the course of his employment. This requires academics to extend their researches encompassing the job experiences of the employees. Still more implications are for SMEs to convert their organisations from labor based to knowledge based.

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