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RESEARCH ARTICLE

Various Approaches used by Researchers in the Fields of Business, Management, and Accounting in Treating Intellectual Capital

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ABSTRACT

This research aims to discuss how intellectual capital issues are treated in accounting research. This study answered research questions through a Systematic Literature Review (SLR) of 367 peer-reviewed articles in Business Management and Accounting (BMA). A detailed search was done using the publish or perish version 8 search engine. It selected the Scopus database through the "intellectual capital" keyword. The database was filtered to articles published from 2017–2021. This study selected samples using several criteria. First, the article titles should be related to intellectual capital. After that, the article is published in a peer-reviewed journal that is not discontinued. Finally, the subject matter is BMA. Most research on intellectual capital placed this topic as an independent variable at 44.14% of the total articles. Some others used it as a systematic review (21.25%), a dependent variable (13.08%), an intervening/mediating variable (7.08%), and a moderating variable (0.27%). Meanwhile, the rest employed intellectual capital as descriptive research without conducting any testing. This research is the first to map how intellectual capital is treated in accounting research.

Keywords: Accounting research, BMA, Intellectual capital, SLR.

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1. Introduction

Since its inception, intellectual capital has been considered an intangible asset of the company (Dabić *et al.*, 2020). First introduced in 1969 by Galbaraith, this concept continues to develop and is very flexible, dynamic, and contemporary. It has received increasing attention from scholars and researchers to investigate this topic from year to year (Bellucci *et al.*, 2021). To date, papers studying intellectual capital have been widely published in various research journals, such as those related to agricultural science (namely Agriculture, based in Switzerland), health science-related journals (BMC Health Services Research and International Journal of Environmental Research and Public Health), journals related to psychology (Current Psychology and Frontiers in Psychology), and ethics-related journals (International Journal of Ethics and Systems). Strikingly, a journal specifically dedicated to studying intellectual capital, namely the Journal of Intellectual Capital, has been published since 2000. Since then, researchers' interest in publishing intellectual capital studies in this journal has continued to increase from year to year. This can be seen from the increasing trend of issues published in the Journal of Intellectual Capital, as shown in Fig. 1 below.

Until 2017, articles in the Journal of Intellectual Capital were published only in four issues a year. The number of issues was added to five in 2018 and 6 in 2019–2020 to accommodate more articles in this field. In 2021, seven issues were even published in a year, showing that the research interest in the field of intellectual capital is quite high.

While intellectual capital has received growing attention in the academic field, it is also an important practice for companies that they must take into account. It is related to corporate governance, company reputation, company performance, and so on. One of the widely used methods of measuring intellectual capital is the value-added coefficient, known as VAIC (Value Added Intellectual Coefficient). This method uses data from financial reports that make the test can be carried out more easily. In addition, it allows us to compare one company with another company (Bayraktaroglu *et al.*, 2019).

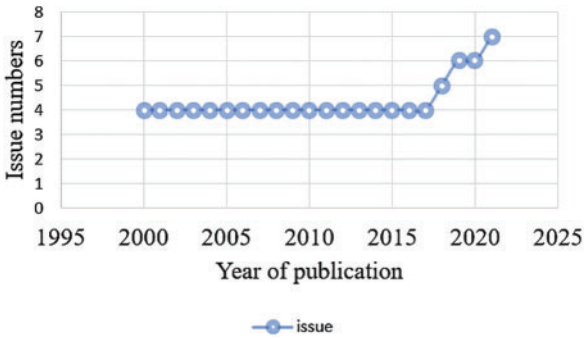

Fig. 1. Increasing trend of issues published in the journal of intellectual capital.

When investigating intellectual capital, many studies focus on the components developed by Pulic (2000), who divided this area into three components, namely human capital, structural capital, and relational capital. However, as research on this area develops, researchers explore further information by dividing intellectual capital into different components. For example, Li and Zhao (2018) divide intellectual capital into human capital and organizational capital. Meanwhile, Cabrilo and Dahms (2020) divide this area into human capital, renewal capital, and entrepreneurial capital. Other scholars then classify intellectual capital into human capital, innovation capital, customer capital, and process capital (Ni *et al*., 2020). Finally, Qurashi *et al*. (2020) split it into human capital, structural capital, relational capital, social capital, techno capital, and spiritual capital.

Papers that examine intellectual capital are related to many factors. For example, Salehi *et al*. (2022) associate intellectual capital with contractual costs. While Vrontis *et al*. (2021) connect this field with equity crowdfunding, Gupta and Raman (2021) link it to operational efficiency. Further, Lu *et al*. (2021) connect intellectual capital with sustainable growth. It is important to note that these researchers place intellectual capital as an independent variable.

On the other hand, other researchers place intellectual capital as a dependent variable, for example Nicolò *et al*. (2021), who link performance and governance with intellectual capital disclosure. Further, Scafarto *et al*. (2021) associate family firm status and board structure with intellectual capital efficiency. Finally, Ginesti and Ossorio (2021) examine the influence of family-related factors on Intellectual capital.

To the author's knowledge, there is no previous research that maps how researchers treat intellectual capital in accounting research. Research that conducted systematic reviews in the past discussed other topics, for example, the issue of sustainability (Alvino *et al*., 2021; Minoja & Romano, 2021; Secundo *et al*., 2020; De Villiers & Umesh, 2020), health issues (Huang *et al*., 2021; Pflugfelder, 2021), knowledge management, entrepreneurship (Bamel *et al*., 2022), the impact of intellectual capital in two decades (Paoloni *et al*., 2020), and business models (Baima *et al*., 2020).

Given this fact, the present research specifically investigates intellectual capital articles from an accounting perspective published in accounting research journals, which are indexed in Scopus. It aims to see how the accounting discipline reports and treats intellectual capital. To achieve this goal, this research seeks to produce table and graphic models that represent:

1. Dimension description of intellectual capital
2. Description of variables related to intellectual capital
3. Description of the research methods used
4. Overview of the relationships between the variables

This research examines the development of intellectual capital research by identifying, exploring, and finding gaps in previous research. As a result, it provides benefits for future researchers who would like to find the latest research ideas, especially those related to the field of accounting. For practitioners, the results of this research provide insight into the topic of intellectual capital related to its application in companies.

This article is structured systematically, beginning with presenting the theoretical foundation of intellectual capital and how it was researched in the past. It is followed by the methodology section, which elaborates on the implementation of a Systematic Literature Review in this current research. The next section discusses the results of the Systematic Literature Review. In this part, the research reviews, discusses, and criticizes previous research. Finally, in section 4, the research presents the conclusions, limitations, and directions for future research.

2. Methodology

This study was conducted under a Systematic Literature Review (SLR). It focused on articles related to intellectual capital in journals whose subject area was Business, Management, and Accounting (BMA). Sample articles were collected by detailed search using the publish or perish version 8 search engine. In the first step, it selected the Scopus database and limited the search based on the criteria or the keyword "Intellectual Capital." The search was filtered to articles published from 2017–2021. Searches were carried out annually because there were a myriad of articles discussing intellectual capital. In fact, Publish or Perish was only able to collect 200 articles searched at a time. Thus, the search selected data in five years and generated 1000 articles. This study also used the keyword "intellectual capital" to capture more articles about intellectual capital and its relationship with other variables. Next, samples were selected using several criteria:

1) The title is related to intellectual capital.

2) The article is published in a peer-reviewed journal that is not discontinued.

3) The subject matter is BMA.

Fig. 2 presents a flow diagram illustrating the sample selection procedure.

After the Scopus database was collected, the second step was to extract articles whose titles were related to intellectual capital. From this process, 543 articles were obtained with details as shown in Fig. 3.

In the next step, 543 articles that published intellectual capital were recapitulated and then checked with scimagojr.com to get their quartile information. This process eliminated 59 articles because the articles were published in conference proceedings (not journal articles)

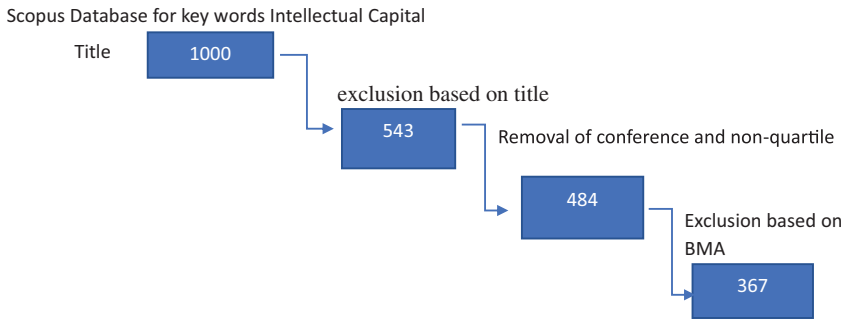

Fig. 2. Sample selection flow diagram.

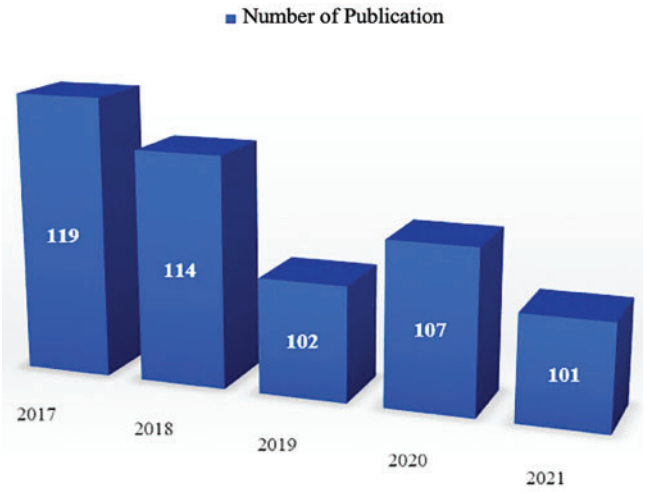

Fig. 3. Number of publications per year.

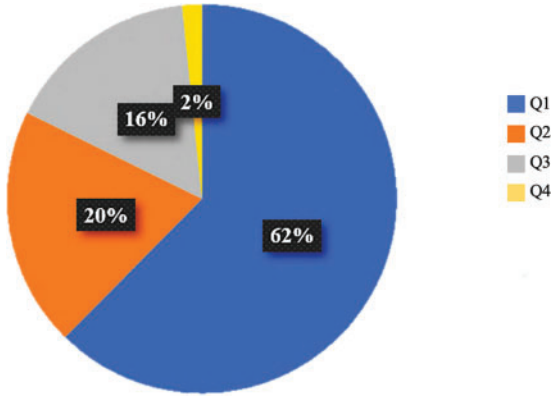

Fig. 4. Publication quartile percentage.

and discontinued Scopus journals. This research wished to explore information from articles published by journals that still had a good ranking reputation. The final step was to detect in Scimagojr journals whether these articles were in the BMA subject area. At this stage, there were 367 articles published in 120 reputable journals Q1-Q4, as provided in Tables I and II.

To answer the objectives of the research, the contents of the selected articles were analyzed. The results triggered novel insights and criticism; thus, suggestions were provided for future research.

3. Results

The results of the Systematic Literature Review (SLR) showed that the majority (62%) of intellectual capital research on BMA was published in Q1 Scopus-indexed journals. The rest was published in Q2, Q3, and Q4 journals, as seen in Fig. 4 below.

The figure above shows that when the journal quartile ranking is smaller, the number of intellectual capital articles in BMA is fewer. This study found that 20% of articles were published in Q2 journals. Meanwhile, 16% were published in Q3 journals, and only 2% were published in Q4. Furthermore, the above figure implies that researchers are very enthusiastic about publishing their articles in Q1 journals. This enthusiasm is exemplified by the 132 of 365 articles (36%) published only in the Journal of Intellectual Capital. The following are the top eleven journals with the most publications, as shown in Table III.

Table III describes that 7 journals are categorized in Q1, while 3 journals are in the Q2 category, and 1 is ranked in the Q3 category. These journals are included in the top eleven with the most publications. As shown in the table, the total number of journals published in this top eleven is 215 articles. This number covers 58.58% of the total articles studied in this research.

This research also discovered 45 researchers who published their articles more than once in reputable journals for 5 years (2017–2021) as the first author, as shown in Table IV below.

The most research publications on intellectual capital in 5 years were held by Amina Buallay, with 6 articles. Muhammad Nadeem was second with 5 articles, followed by Giustina Secundo and Jian Xu with 4 articles each. Next, 8 researchers published 3 articles: Chih-Hsing Liu, Eugénia Pedro, Filipe Sardo, John Dumay, Kaveh Asiaei, Marta Buenechea, Tamanna Dalwai, and Tasawar Nawaz. The remaining 33 researchers published 2 articles each.

If we look at the dimensions of intellectual capital studied by researchers, most researchers used the division of intellectual capital into 3 dimensions, namely human capital, structural capital, and relational capital (Alves *et al.*, 2021; Gürlek, 2021; Nicolò *et al.*, 2021; Wang *et al.*, 2021; Weqar *et al.*, 2021). Nevertheless, a few researchers divided the intellectual capital dimension into several other dimensions, such as trust capital (Oliveira *et al.*, 2020), organizational capital (Ahmed *et al.*, 2020), renewal capital (Cabrilo & Dahms, 2020), social capital (Qurashi *et al.*, 2020), and others. Furthermore, most research used the

TABLE I: Articles Published in Journals Q1 and Q2

Q1 Journal	Pub	Q2 Journal	Pub
Accounting Forum	1	African Journal of Economic and Management Studies	1
Accounting, Auditing and Accountability Journal	5	Asian Review of Accounting	1
Asia Pacific Management Review	2	Asia-Pacific Journal of Business Administration	1
Business Ethics	1	Australian Accounting Review	3
Business Process Management Journal	1	Baltic Journal of Management	1
Corporate Governance (Bingley)	1	British Food Journal	1
Corporate Governance: An International Review	1	Cogent Business and Management	2
Corporate Social Responsibility and Environmental Management	2	European Journal of International Management	1
Critical Perspectives on Accounting	5	Global Business Review	1
Decision Sciences	1	Human Resource Development International	1
Eurasian Business Review	1	International Journal of Accounting and Information Management	1
European Business Review	1	International Journal of Construction Management	1
European Management Review	2	International Journal of Emerging Markets	1
European Research on Management and Business Economics	1	International Journal of Finance and Economics	1
Foresight and STI Governance	1	International Journal of Innovation Management	1
Human Resource Management	1	International Journal of Islamic and Middle Eastern Finance and Management	3
IEEE Transactions on Engineering Management	1	International Journal of Law and Management	1
Industrial Management and Data Systems	1	International Journal of Manpower	1
Innovation: Management, Policy and Practice	1	International Journal of Productivity and Performance Management	3
International Journal of Accounting Information Systems	1	Journal of Accounting and Organizational Change	1
International Journal of Contemporary Hospitality Management	1	Journal of Accounting in Emerging Economies	2
International Journal of Hospitality Management	3	Journal of Asian Finance, Economics and Business	5
International Journal of Human Resource Management	1	Journal of Business Economics and Management	2
International Journal of Operations and Production Management	2	Journal of Innovation and Entrepreneurship	1
International Journal of Production Research	2	Journal of Management and Governance	9
Journal of Asia Business Studies	2	Journal of Management and Organization	1
Journal of Business Research	7	Journal of Modelling in Management	1
Journal of Cleaner Production	2	Journal of Research in Marketing and Entrepreneurship	1
Journal of Enterprise Information Management	1	Journal of Small Business Strategy	1
Journal of Hospitality and Tourism Management	1	Journal of Workplace Learning	1
Journal of Hospitality Marketing and Management	2	Management (France)	1
Journal of Innovation and Knowledge	1	Measuring Business Excellence	4
Journal of Intellectual Capital	132	Meditari Accountancy Research	10
Journal of Knowledge Management	10	Personnel Review	1
Journal of Management Development	2	Problems and Perspectives in Management	2
Journal of Operations Management	1	Risks	1
Journal of Small Business and Enterprise Development	1	Social Responsibility Journal	1
Journal of Small Business Management	1	Technology Analysis and Strategic Management	1
Knowledge Management Research and Practice	3	TQM Journal	1
Management Decision	6	Amount	73
Management International Review	1		
Oeconomia Copernicana	3		
R and D Management	1		
Service Business	2		
Service Industries Journal	1		
South Asian Journal of Business Studies	1		
Technological Forecasting and Social Change	7		
Tourism Management	1		
Amount	229		

TABLE II: Articles Published in Journals Q3 and Q4

Q3 Journal	Pub	Q4 Journal	Pub
Academic Journal of Interdisciplinary Studies	1	Academy of Accounting and Financial Studies Journal	3
Academy of Strategic Management Journal	2	Electronic Journal of Knowledge Management	1
Accounting	1	International Journal of Banking, Accounting and Finance	1
African Journal of Hospitality, Tourism and Leisure	1	International Journal of eBusiness and eGovernment Studies	1
Banks and Bank Systems	1	Amount	6
Business: Theory and Practice	1		
Contaduria y Administracion	1		
Custos e Agronegocio	1		
Human Systems Management	2		
Humanities and Social Sciences Letters	1		
Intangible Capital	1		
International Journal of Business and Globalisation	1		
International Journal of Business and Society	1		
International Journal of Disclosure and Governance	2		
International Journal of Entrepreneurship	1		
International Journal of Knowledge Management Studies	1		
International Journal of Learning and Intellectual Capital	19		
Investment Management and Financial Innovations	1		
Journal of Financial Regulation and Compliance	1		
Journal of Islamic Accounting and Business Research	1		
Journal of Technology Management and Innovation	1		
Knowledge and Process Management	4		
Management and Marketing	2		
Nankai Business Review International	1		
Pacific Accounting Review	2		
Pakistan Journal of Commerce and Social Science	2		
Polish Journal of Management Studies	2		
Quality-Access to Success	3		
Serbian Journal of Management	1		
Amount	59		

TABLE III: Top Eleven Journal Publication

No	Journal	Quantity	Quartile	Percentage
1	Journal of Intellectual Capital	132	Q1	35.97
2	International Journal of Learning and Intellectual Capital	19	Q3	5.18
3	Journal of Knowledge Management	10	Q1	2.72
4	Meditari Accountancy Research	10	Q2	2.72
5	Journal of Management and Governance	9	Q2	2.45
6	Journal of Business Research	7	Q1	1.91
7	Technological Forecasting and Social Change	7	Q1	1.91
8	Management Decision	6	Q1	1.63
9	Accounting, Auditing, and Accountability Journal	5	Q1	1.36
10	Critical Perspectives on Accounting	5	Q1	1.36
11	Journal of Asian Finance, Economics and Business	5	Q2	1.36
Total		215		58.58

Value Added Intellectual Coefficient (VAIC) measurement model developed by Public to measure intellectual capital. This model consists of Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Capital Employee Efficiency (CEE) (Maji & Goswami, 2020; Onumah & Duho, 2020; Ousama *et al*., 2020; Rosita, *et al*., 2020; Ting *et al*., 2020). Then, a few researchers added Relational Capital Efficiency (RCE) (Buallay *et al*., 2020) and Innovation Capital (INVC) (Soewarno & Tjahjadi, 2020) into the dimensions of the measured variable. This VAIC model is generally chosen because of its available information, and standard measurements with this model are easy to calculate and consistent for analysis at any period. In addition, this model also has informative relevance and can be easily interpreted by investors and managers (Castro *et al*., 2021). Only a small number of researchers measure intellectual capital with the IC index, for example Nicolò *et al*. (2021).

TABLE IV: Researchers with More than One Article in Reputable Journals

No	Researchers' names	Publication
1	Amina Buallay	6
2	Muhammad Nadeem	5
3	Giustina Secundo	4
4	Jian Xu	4
5	Chih-Hsing Liu	3
6	Eugenia Pedro	3
7	Filipe Sardo	3
8	John Dumay	3
9	Kaveh Asiaei	3
10	Marta Buenechea	3
11	Tamanna Dalwai	3
12	Tasawar Nawaz	3
13	Aino Kianto	2
14	Allam Hamdan	2
15	Antonio Salvi	2
16	Antonio Ferreira	2
17	Carol Y. Y. Lin	2
18	Christian Nielsen	2
19	Faizi Weqar	2
20	Gianluca Ginesti	2
21	Giuseppe Nicolo	2
22	Harishankar Vidyarthi	2
23	Ihyaul Ulum	2
24	Jesus Barrena	2
25	Karam Pal Narwal	2
26	Lara Agostini	2
27	Mariia A. Molodchik	2
28	Marina Dabic	2
29	Matteo La Torre	2
30	Maurizio Massaro	2
31	Min Zhang	2
32	Muhammad Khalique	2
33	Muhammad Shujaat Mubarik	2
34	Ngoc Phu Tran	2
35	Oksana Lentju Senkova	2
36	Paula Benevene	2
37	Ricardo Vinicius Dias Jordao	2
38	Santi Gopal Maji	2
39	Subhash Abhayawansa Swinburne	2
40	Tatiana Andreeva	2
41	Wahyu Widarjo	2
42	Waseem Barka	2
43	Yiru Yang	2
44	Yongyi Shou	2
45	Zhining Wang	2

From the research subjects, Table V presents 10 research that have been most researched on intellectual capital in five years.

Table V shows that technology companies are not the most researched topic regarding intellectual capital. Instead, researchers tended to explore combinations of companies, where 37.87% of the 367 papers in this research used company combinations as their research subjects. The second topic that mainly attracted researchers' interest was analyzing articles that have been researched by other researchers in the form of systematic reviews.

If we look at the type of company or organization, the table above indicates that banks and financial institutions

TABLE V: The Research Subject is the Topic of Intellectual Capital

No	Research subject	Quantity	Percentage
1	Combined companies	139	37.87
2	Article	45	12.26
3	Banks and financial institutions	30	8.17
4	Universities and education	23	6.27
5	Small business	21	5.72
6	Manufacturing company	19	5.18
7	Pharmaceutical company	7	1.91
8	Case studies	6	1.63
9	Technology company	6	1.63
10	Health company	5	1.36

TABLE VI: Treatment of Intellectual Capital by Researchers

No	Intellectual capital	Quantity	Percentage
1	Dependent variable	48	13.08
2	Independent variable	162	44.14
3	Mediating variable	26	7.08
4	Moderating variable	1	0.27
5	Sistematic literature review	78	21.25
6	Other	52	14.17
	Total	367	100

are organizations mostly investigated by scholars. These institutions were followed by universities/educational institutions, small businesses, manufacturing companies, pharmaceutical companies, case studies on certain companies, technology companies, and health companies.

This study also found that research examining intellectual capital is treated differently by researchers, as shown in Table VI.

As described in Table VI, most research treats intellectual capital as an independent variable. Using quantitative methods, studies that placed intellectual capital as an independent variable mostly associated it with financial performance variables. They were measured using various dimensions, such as profitability and productivity. This finding is in line with Baima *et al*. (2020), who stated that the main focus of the intellectual capital study was to examine the relationship between IC and company performance. Their study provided mixed results. Some dimensions were influential, while others were not. Very little research links intellectual capital with other variables, such as financial distress and corporate growth.

Some studies also treat intellectual capital as a dependent variable. These studies also used quantitative methods where most studies placed intellectual capital as a dependent variable and linked it with governance variables such as size, gender, ownership, and CEO. Meanwhile, other studies that put intellectual capital as an independent variable placed governance as a control variable (Aslam & Haron, 2021; Chen *et al*., 2021; Ge & Xu, 2021; Nicolò *et al*., 2021; Scafarto *et al*., 2021).

The research results that place intellectual capital as a dependent variable also vary, where there were dimensions of governance that influenced intellectual capital and some that did not. Based on these studies, few researchers have placed intellectual capital as a dependent variable, linking

the concept with other variables outside this governance dimension, such as labour capital and interest. A more in-depth study is needed to determine the variables that influence intellectual capital in the company.

Furthermore, other research treats intellectual capital as an intervening/mediating variable. Still using quantitative methods, research placed intellectual capital as an intervening/mediating variable, linking it to company performance and governance. However, in this research, we found many variations of variables used in the role of intellectual capital as a link between one variable and other variables. For example, Oliveira *et al*. (2020), who studied IC, examined a link between CSR and performance as well as between knowledge sharing and organizational results. Also, Afshari and Nasab (2021) examined IC as a link between talent management and organizational learning capability. The results of research that places IC as a mediating/intervening variable generally state that IC is a variable that mediates the relationship between several variables.

While the aforementioned studies treat intellectual capital as a research variable, others examine it as SLR. Many researchers conducted SLR on intellectual capital to find gaps that researchers can use in the future to conduct studies in various sectors. Dabić *et al*. (2020) revealed several contributions that SLR research can provide in the field of intellectual capital. For instance, it helps researchers identify potentially under-researched topics that require further attention. Furthermore, they also explained that SLR provides information and suggestions for new research areas that are worthy of study because other researchers have not explored them. As a result, this research method allows the research to provide richer information regarding the relationship between IC and other important research areas.

There is only one article that discusses intellectual capital as a moderating variable. The article used intellectual capital to moderate the relationship between investment in learning practices and operational performance. Finally, the rest of the research places intellectual capital as descriptive research without conducting any testing. Some measure intellectual capital with other test tools, such as Data Envelopment Analysis (DEA) and Alman Z Score.

4. Conclusion

In conclusion, this research indicates that most research on intellectual capital places this concept as an independent variable (44.14% of the total articles). Only 13.08% of articles put it as a dependent variable at 13.08%. Meanwhile, 7.08% consider intellectual capital as an intervening/mediating variable. After that, those who treat intellectual capital as a systematic review are quite high at 21.25%. Then, those who treat intellectual capital as a moderating variable are only 0.27%. Finally, the rest treats intellectual capital in other ways, for example, by conducting descriptive research and using different measurement methods, namely Data Envelopment Analysis (DEA) and Alman Z Score.

5. Limitations and Future Research

Despite the intriguing results, this research has several limitations. Firstly, because the research used Publish or Perish, only 200 articles could be collected per year. There may be articles related to the same topic that were not included in this observation. Thus, other research in the future is recommended to use other article collection applications that can collect more articles than that,

Second, because the keyword was intellectual capital, it could be that during the first stage of sorting, there were articles that might discuss intellectual capital but did not use intellectual capital out of the list of articles. It is recommended that future research use sorting with content analysis. Following that, these three studies did not sort research quartiles based on their respective levels. Consequently, this could cause bias in the conclusion. This research then suggests future research to be based on journal rankings.

Fourth, we admit that the observation year is too short, five years. Future research is expected to be able to map this intellectual capital research within twenty years. The results of these five studies provide information that studies related to intellectual capital that have not been widely researched are those related to the placement of intellectual capital as an intervening variable and also as a dependent variable. Future researchers have good opportunities to study this issue.

Conflict of Interest

The authors declare that they do not have any conflict of interest.

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