Leaders Leading Networked Mentoring:
A New Language of Leadership in the Era of Knowledge

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Abstract

The aim of this study is to present a general bibliometric analysis for the main key-words of my research topic.

We are living in **The Era of Emerging Knowledge**, where the 4th Industry revolution is taking place, and the evolving of knowledge and technologies are so frequent that the ability to change and be current is a necessity. Managers and employees must cope with uncertainty and adapt quickly to rapid changes. **Mentoring** programs are an organizational mechanism for developing professional identity. Despite the leader's significant role as a mentor and a developer to his subordinates, no **leadership** studies have been found to have combined the evolving knowledge of mentoring and developmental networks.

In this study, I will analyze the knowledge from those disciplines, **trying to combine them** into a whole complex that offers a leadership style, leading to the existence of **developmental networks** – the **networking leader**.

Key words: Mentoring, Developmental Network, Leadership, Complexity Leadership
J.E.L. classification: J24, J28, J53, J62

1. Introduction

The aim of this study is to present a general bibliometric analysis for the key words of the combined conceptualization: **Leaders Leading Networked Mentoring**. Through the **VOSviewer** mapping methodology, I will demonstrate the current knowledge, and its gap.

In this study, we will try to integrate the knowledge from those disciplines into a whole complex that offers a leadership style, leading to the existence of **developmental networks** – the **networking leader**. It must be in service of the organization's work and goals. Leading the developmental networks of the subordinates should influence the networks' members and expertise, aiming the occupational development towards organizational goals. *"Leadership networking is about building relationships and making alliances in the service of others . . . and in service of the organization's work and goals" (*Grayson & Baldwin, as cited in Novak, 2008, p. 7).

We will suggest the *"**complexity leadership** theory"* (Uhl-Bien et.al 2017), as a leadership concept which enables the leader to lead his team in a way of variability, up-to-date and innovation. This leadership conception (like other developmental leadership theories) emphasizes the role of the leader in the development of his subordinates There is a complexity in understanding the impact of the manager's leadership on his subordinates' professional development. To a better understanding of this complexity, a bibliometric analysis was conducted in three facets. I added *"Management"* to the search key-words, to elaborate the array of data to studies that refers to the 'role' at the organizations.

The three facets of analyzing:
i. Management /Leadership & Mentoring.
ii. Management /Leadership & Mentoring & Developmental Network.
iii. Management /Leadership & Mentoring & Complexity/ Enabling Leadership.

2. Theoretical background

Vuca!

"It is not the strongest of the species that survive, nor the most intelligent, but the one more responsive to change" *(Charles Darwin).*

We are living in **The Era of Emerging Knowledge**, where the 4th **Industry** revolution is taking place. It seems Darwin's statement is truly relevant!

In the era of emerging knowledge, the evolving of knowledge and technologies are so frequent that the ability to change and be current is a necessity- to the organization, to employees, and to managers. Managers and employees must cope with uncertainty and adapt quickly to rapid changes. *Mentoring* programs are an organizational mechanism for developing professional identity. As careers become more boundary less, so will be the sources from which individuals draw support in their careers. The traditional dyadic mentoring steps aside in favor of the *'multiple mentoring'*- the **Developmental network** (Higgins et. al, 2001). Despite the leader's significant role as a mentor and a developer to his subordinates, no *leadership* studies have been found to have combined the evolving knowledge of mentoring and developmental networks. It seems that the research of mentoring and the study of leadership in organizations are developing in parallel facets. The parallel research did not combine the conceptualization into a world of contemporary organizational knowledge.

3. Research methodology

The bibliometric analysis was conducted by **VOSviewer**- a software tool for creating visualized maps based on network data (Eck et.al, 2022). The data were driven from webofscience or lens.org (preferring the last, for better exporting options). VOSviewer creates Maps based on items. Items are: terms, publications, researchers. For each item a strength of a *link* is calculated, represented by a positive numerical value. A *link* is a connection between two items. The current bibliometric analysis used two forms of links:

- "*Citation*"- bibliographic coupling links between publications. It can be analyzed by documents, sources or authors. I chose the 'author' option, to locate the main authors on each analysis. The strength of a link indicates the number of cited references two publications have in common.
- "*Co-Occurrence*" - links between terms. It can be analyzed by author keywords, all keywords or MeSH keywords. I usually chose the author keyword, unless it wasn't available. The strength of a link indicates the number of publications in which two terms occur together.

The items are clustered by the strength of the links. An item may belong to only one cluster. There may be items that do not belong to any cluster.

4. Findings

4.1. Management /Leadership & Mentoring

Image 1 shows the VOSviewer citation map for [*Leadership, Management, Mentoring*]. The Lens search brought up 9,865 publications in the time period: 2001-current (2022). VOSviewer map could include up to 1,000 publications. The most relevant 1,000 produced 730 Links, only 108 of them connected in 18 clusters. Unfortunately, that map couldn't be shared by VOSviewer, unless I had limited the included items for "*minimum 3 Citations*". That definition created the map on Image 1. 533 Items were included, 49 of them connected in 56 links on 11 clusters. The total strength of the links is 56. That is much less strength compared to the previous maps mentioned above. It will be the same for the next maps, as an approvement to the argue of our research.

Images 1 and 2 demonstrate the links between studies on those topics. Table 1 below describes the search characteristics.

Image 1 Citation map- Manag.Lead_ment https://tinyurl.com/2yfydp43
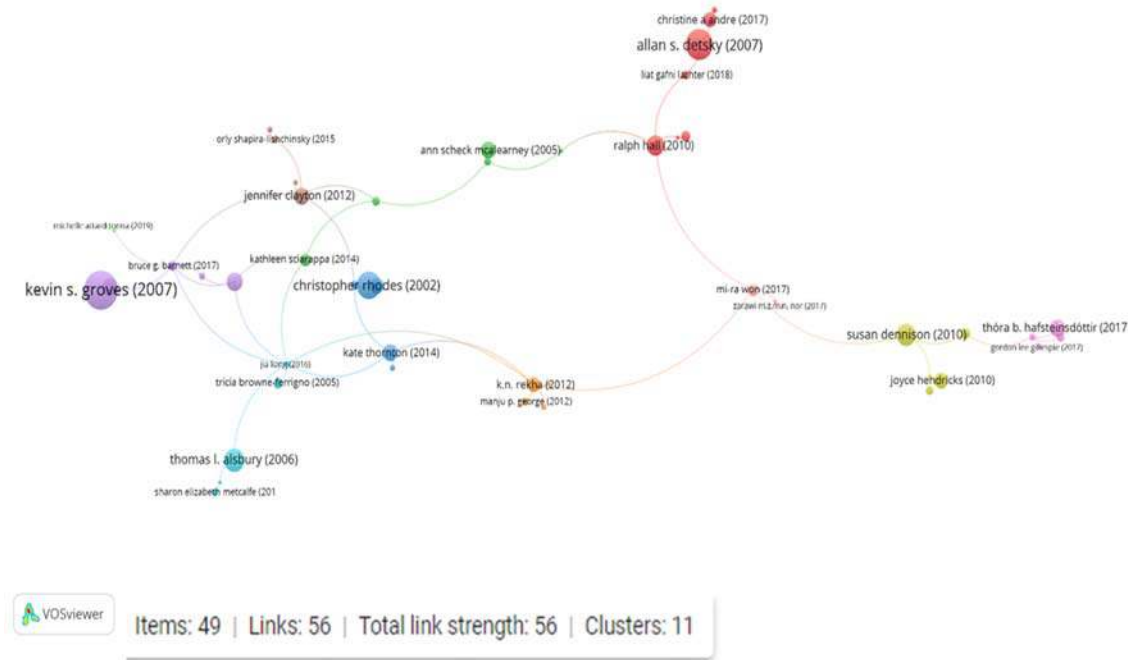
Source: Own computation

Table no. 1 Lens's search characteristics for Images 1 and 2

	Image 8 ***Manag.Lead_ment***	**Image 10** ***Manag.Lead_ment_Dev.Net***
The search words **Lens's Scholar located**	*Management (Mang.)* *Leadership (Lead)* *Mentoring (ment)* *9,865*	*Management (Mang.)* *Leadership (Lead)* *Mentoring (ment)* *Developmental Network (Dev.Net)* *5,022*
Lens's search link	*https://link.lens.org/NjqIydxBFne*	*https://link.lens.org/hagDsuscvXe*

Source: Own computation

Both searches were focused to Lens's Subjects:
Management Science and Operations Research, Industrial relations, Management Information Systems, Tourism, Leisure and Hospitality Management, Strategy and Management, Business and International Management, Management, Monitoring, Policy and Law, Economics, Econometrics and Finance (miscellaneous), Computer Networks and Communications, General Social Sciences, Marketing, Organizational Behavior and Human Resource Management, Management of Technology and Innovation, Education, Sociology and Political Science, Applied Psychology, Economics and Econometrics, Leadership and Management.

Table 2 below contains the main author for each cluster, the number of times cited and main key words**.** The most cited authors are: Kevin S. Groves (2007)- 228 times cited, Allan S. Detsky (2007)- 147 times cited, Christopher Rhodes (2002)- 115 times cited. Out of these 3 authors, we find Groves's key words to be the most relevant to the current study, specifically: Management Development, Leadership Development. None of the main authors' work were published at the past 5 years! Naturally, the newest the publication is, the less often it could be cited. Looking back at the array of

data, we looked for the "*Normed score*", which is "*the number of citations of the document divided by the average number of citations of all documents published in the same year and included in the data*" (see Image 2). Those authors got a high Normed score, more than some of the main authors included in Table 1. The main key words of these two authors are closer to the topic of the current research: *Mentoring, Leadership; leadership development*.

Table no. 2 Main author for cluster, Number of citation and main Key Words (By image 1)

Cluster	Main Author	Cited	Main Key Words
1	Allan S. Detsky (2007) Ralph Hall (2010)	147 65	Nurse education; Public health; Peer mentoring; Leadership theory; Higher education; Psychology; Pedagogy; Organizational skills; Peer feedback;
2	Ann Scheck Mcalearney (2005) Kathleen Sciarappa (2014)	44 25	Psychology; Health care; Protégé; Leadership development; Health services; Pedagogy; Instructional leadership; Training program; Internship
3	Christopher Rhodes (2002) Kate Thornton (2014) Pak Tee Ng (2012)	115 44 41	Sociology; Pedagogy; Psychological intervention; Coaching; Teacher learning; Medical education; Professional development; Educational leadership; Professional support; Performance management
4	Susan Dennison (2010) Joyce Hendricks (2010)	77 40	Nurse education; Peer group; Nursing; Social support; Health care quality; Peer mentoring; Medical education; Leadership; Educational leadership; Pedagogy; Leadership style; Neuroleadership; Transformational leadership; Shared leadership
5	Kevin S. Groves (2007) Christopher Rhodes (2013) Sally J. Zepeda (2012)	228 55 50	Business; Management; Neuroleadership; Management development; Leadership development; Line management; Cost leadership; Knowledge management; Shared leadership; Psychology; Pedagogy; Coaching; Talent management; Professional development; Educational leadership; Sociology; Instructional leadership
6	Thomas L. Alsbury (2006)	82	Psychology; Pedagogy; Career development; Teacher education; Medical education; Professional development; Internship
7	K.N. Rekha (2012)	36	Employability; Psychology; Pedagogy;
8	Jennifer Clayton (2012)	50	Educational leadership; Sociology; Pedagogy; Accountability; Instructional leadership; Leadership development; Academic achievement;
9	Thóra B. Hafsteinsdóttir (2017)	47	Nursing; Mentorship; Career development; Nursing research
10	Mi-Ra Won (2017)	24	Pedagogy; Mentorship; Peer mentoring; Medical education; Medicine; Coping (psychology)
11	No main Author		

Source: Own computation

Image 2 below is taken from Lens analysis for "*Scholarly Work over time*". There is a clear trend of increasing Documents count over the years. This trend reinforces the question mentioned above, regarding the low number of cited publications on the last 5 years.

The above analysis (Images 1 and 2 and Table 1) refer to the first facet of Networked Leadership - traditional mentoring. On the next section we will add the facet of Developmental Network, as the Era of Knowledge borderless multiple mentoring.

*Image 2 Lens Scholarly Work overtime*

Source: Own computation

4.2. Management /Leadership & Mentoring & Developmental Network

Image 3 shows the VOSviewer citation map for [*Leadership, Management, Mentoring, Developmental Network*]. The Lens search brought up 5,022 publications on the time period: 2001-current (2022). VOSviewer map could include up to 1,000 publications. The most relevant 1,000 produced 934 Links, only 47 of them connected in 11 clusters.

In order to keep standard criteria, we kept the limitation of including items with "*minimum 3 Citations*". 823 Items were included, 44 of them connected in 55 links on 10 clusters. Total strength of the links is 55. The characteristics of the current analysis are very similar to the previous one. Nevertheless, the items are different, as can be noticed on Table 3 below.

Image 3: Citation map- Lead.Manag.ment.Dev.Net; https://tinyurl.com/266yhq5y
Source: Own Computation
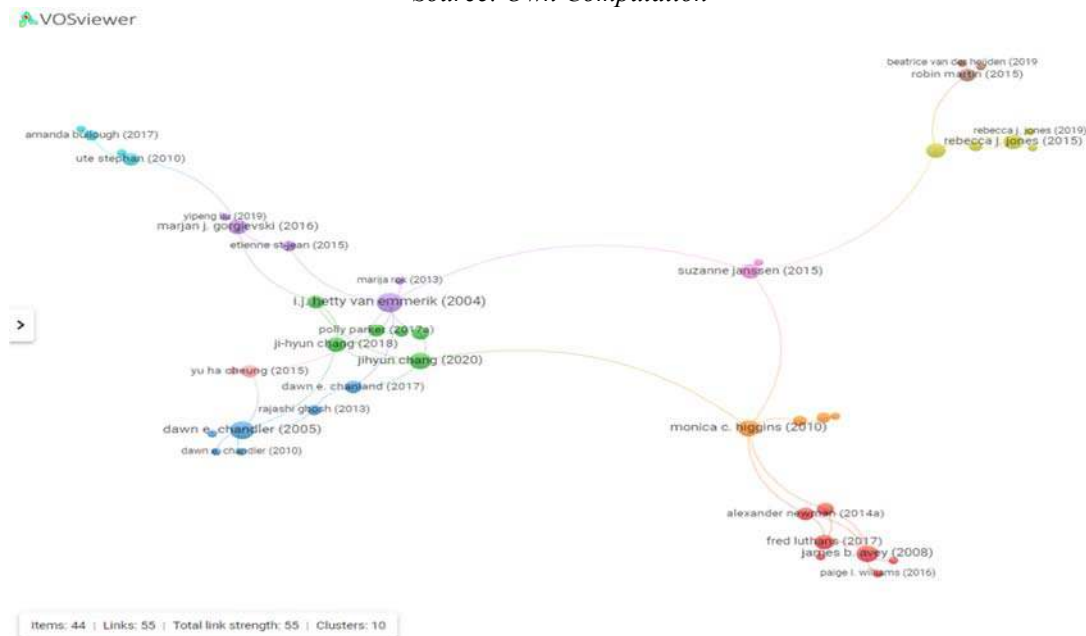
Source: Own computation

Table 3 below contains the main author for each cluster, the number of times cited and main key words. The most cited authors are: James B. Avey (2008) - 783 times cited, Ute Stephan (2010) - 425 times cited, Robin Martin (2015) - 376 times cited, Fred Luthans (2017) - 372 times cited. Out of these 4 authors, I didn't find any key word that is relevant to the current research, or could elaborate new knowledge on the topic.

Like the previous analysis, none of the main authors' work were published in the past 5 years! Again, looking back at the array of data, we looked for the "*Normed score*". Those authors got a high Normed score, more than some of the main authors included in table 2.

Table no. 3 Main authors, Number of citation and main Key Words (By image 3)

| Cluster	Main Author	Cited	Main Key Words
1	James B. Avey (2008) Fred Luthans (2017) Alexander Newman (2014a) Alexander Newman (2014b)	783 372 276 268	Organizational citizenship behavior; Psychological resilience; Psychology; Optimism; Positive organizational behavior; Social psychology; Organizational commitment; Well-being; Human capital; Applied psychology; Self-efficacy; Authentic leadership
2	Yan Shen (2011) Thomas W. Dougherty (2008)	61 46	Psychology; Career development; Expatriate; Network diversity; Social psychology; Personality; Employee development
3	Dawn E. Chandler (2005)	63	Adult development; Erikson's stages of psychosocial development; Developmental psychology; Psychology; Interpersonal communication; Personal learning
4	Rebecca J. Jones (2015) Gil Bozer (2018)	269 87	Job performance; Coaching; Peer coaching; Applied psychology; Social psychology; Professional development; Goal orientation

5	I.J. Hetty Van Emmerik (2004) Marjan J. Gorgievski (2016)	140 105	Psychology; Job satisfaction; Career development; Career satisfaction; Applied psychology; Social psychology; Personality; Well-being; Differential psychology
6	Ute Stephan (2010)	425	Global Leadership; Economics; Marketing; International business; Organizational behavior; Organizational culture; Social psychology; Entrepreneurship
7	Monica C. Higgins (2010)	58	Psychology; Psychosocial support; Social psychology
8	Robin Martin (2015)	376	Psychology; Job satisfaction; Reciprocal; Positive relationship; Work performance; Social psychology
9	Suzanne Janssen (2015)	43	Psychology; Social exchange theory; Network approach; Transactional leadership; Social psychology; Interpersonal relationship
10	Yu Ha Cheung (2015)	13	Core self-evaluations; Developmental psychology; Psychology; Management; Network size; Network structure; Strength of ties; Strong ties; Personality research

Source: Own computation

Unfortunately, the added authors didn't add relevant key words. And why should it? Lens analysis for "*Scholarly Work over time*" (Image 4) demonstrate a decreasing trend of Documents count over the last 5 years. It is clear that there will be a small number of cited publications on the last 5 years.

Image 4 Lens Scholarly Work overtime
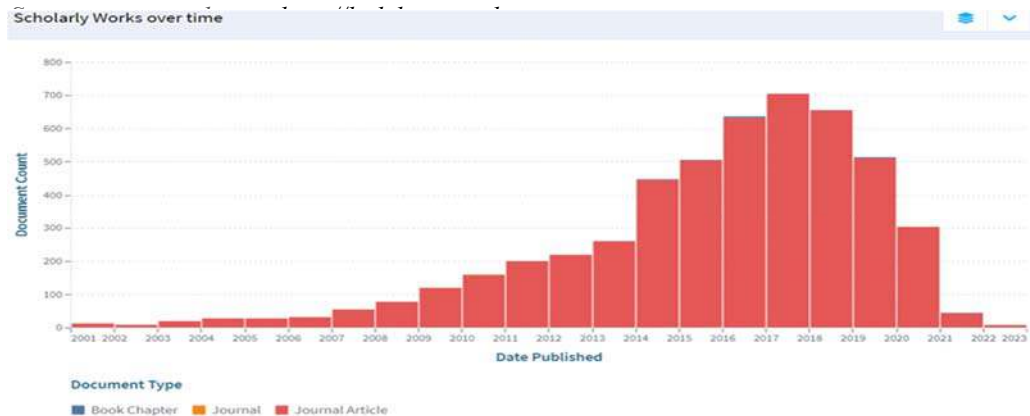
Source: Own computation

4.3. Management /Leadership & Mentoring & Complexity/ Enabling Leadership

The third and last facet of Networked Leadership is the facet of *Enabling Leadership*, a concept driven from *Complexity Leadership Theory*. The theory is based on Complexity science, and it allows us to develop leadership perspectives that extend beyond bureaucratic assumptions to add a view of leadership as a complex interactive dynamic through which adaptive outcomes emerge. In their longitude study, *Uhl-Bien & Arena,* (2017) found that in the reality of complexity, in order to create adaptability in the organization, three types of leadership are needed to be operating in sync: operational leadership, entrepreneurial leadership and *enabling leadership*- a leadership concept which enables the leader to lead his team in a way of variability, up-to-date and innovation. This leadership conception (like other transformational leadership theories) emphasizes the role of the leader in the development of his subordinates.

The following analysis focuses the Leadership concept to *Complexity* and *Enabling Leadership*. The Lens search is for *[Complexity leadership, Enabling leadership, Developmental Network, Mentoring]*, (*https://link.lens.org/MXNlw27OqUf*).

For better understanding of the existing knowledge in this field of research, I analyzed Lens's array of data in two ways: *Co-Occurrence and Citation*. The Lens search brought up 6,957 publications in the time period: 2001-current (2022).

Image 5 shows the VOSviewer *Co-Occurrence* (Author keyword) map. VOSviewer map could include up to 1,000 publications. The most relevant 1,000 produced 193 Links only 56 of them connected in 9 clusters. Total link strength is 33.5.

The most linked word is *Leadership* (23 links, 4 Co-Occurrences). The weak strength of the map is clear.

From the most relevant 1,000 (out of the 6,957 located) 927 items were included, only 56 of them connected in 68 links on 13 clusters. Total strength of the links is 68.

Image 5 Citation map: Comp.lead_dev.net_ment; https://tinyurl.com/yd59mkn2
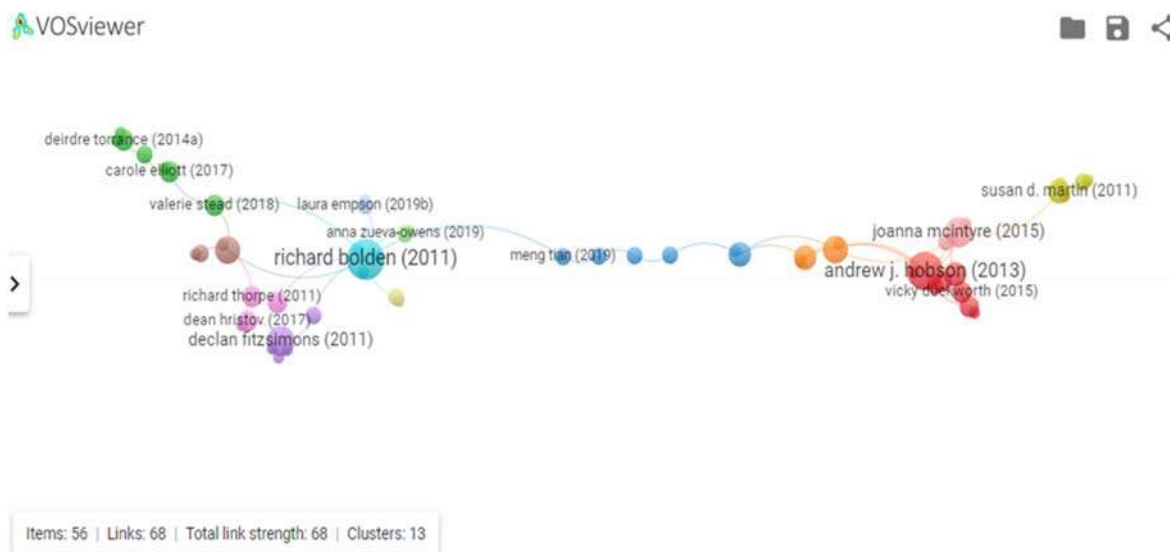
Source: Own computation

Table 4 below contains the main author for each cluster, the number of times cited and main keywords. The most cited authors are: Richard Bolden (2011)- 631 times cited, and far behind: Susan D. Martin (2011) - 255 times cited, Andrew J. Hobson (2013) - 128 times cited,

Richard Thorpe (2011) - 115 times cited. Out of these 4 authors, we find Bolden's key words to be the most relevant to the current study, specifically: *Leadership Development*. Most of the main Key words from the previous Image (5) are not included in the main authors of Image 6. The exceptions are: "*Leadership*" with 23 links, which can be related to Bolden's *"Leadership Development"*, and "*professional development*" with 12 links, which appears few times as the main *keyword* (Image 5/ Table 4). Like the previous analyses, none of the main authors' work were published at the past 5 years! Unfortunately, looking for the "Normed score" at the array of data, we couldn't add any author with a high normed score. It is interesting to notice that although the concept of Complexity Leadership is relatively new (Uhl-Bien, et. al., 2007), and should be interesting for the *Era of Knowledge,* the Lens's analysis shows a decreasing trend of Documents count over the last 5 years (Image 6).

Table no. 4 Main authors, Number of citation and main Key Words (By image 6)

Cluster	Main Author	cited	Main Key Words
1	Andrew J. Hobson (2013)	128	Psychology; Pedagogy; Teacher education;
2	Sharon Mavin (2016)	56	Embodied cognition; Social relation; Sociology; Identity (social science)
3	Michael Fullan (2015) Stewart Ranson (2008)	89 73	Business; Human capital; Capacity building; Professional development; Collective responsibility; Sociology
4	Susan D. Martin (2011) Joke Voogt (2015)	155 122	Sociology; Pedagogy; Supervisor; Teacher education; Educational psychology; Professional learning Professional development
5	Declan Fitzsimons (2011)	115	Epistemology; Sociology; Distributed leadership; Confusion; Social science
6	Richard Bolden (2011)	631	Sociology; Distributed leadership; Leadership development; Social science; Shared leadership
7	Caroline Daly (2017)	23	Psychology; Professional learning community; Pedagogy; Narrative; Teacher education
8	Helen Borland (2014) Beverley Hawkins (2013)	60 51	Environmental resource management; Economics; Process management; Sustainability organizations; Strategic management; Sociology; Pedagogy
9	Richard Thorpe (2011)	115	Sociology; Distributed leadership; Social science; Engineering ethics
10	Joanna Mcintyre (2015)	44	Professional learning community; Pedagogy; Teacher education; Professional development
11	No Main Author		
12	Paula Jarzabkowski (2009)	80	--
13	L.A. Havermans (2015)	73	Psychology; Management; Qualitative research; Knowledge management

Source: Own computation

Image 6 Lens Scholarly Work overtime
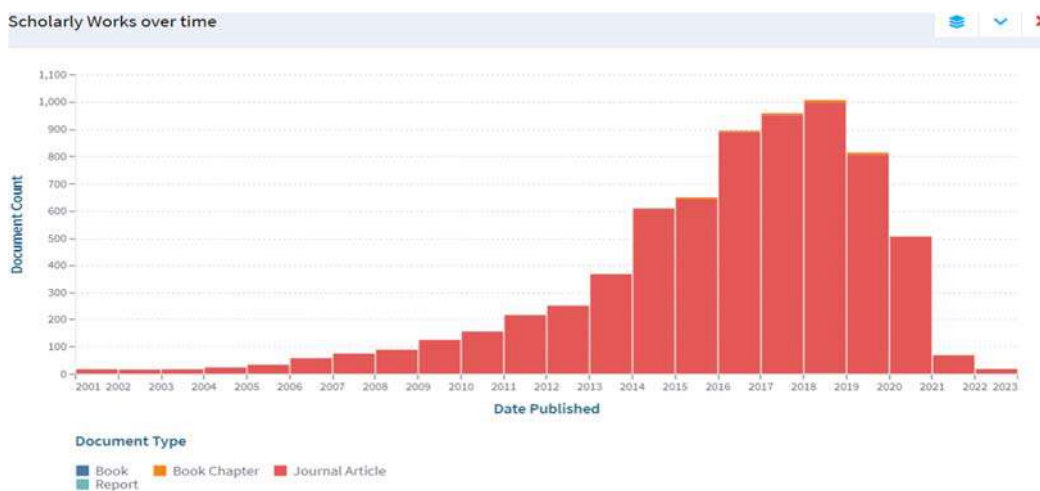
Source: Own computation   *Source: own processing in VOSviewer*

5. Conclusions

The topic of our research is: Leaders Leading Networked Mentoring. Starting with the inspiring article of Higgins et.al (2001), our aim is to combine the insights of Developmental Network theory, with contemporary Leadership theories.

It seems that the research of mentoring and the study of leadership in organizations are developing in parallel facets. The current bibliometric analysis demonstrates these parallel facets.

The combined search of: Leadership, Mentoring, Development Networks, and Complexity leadership - yield low strength maps, containing a small number of items. In addition, we saw a downward trend in publication in recent years.

At the Era of knowledge, the leader has a significant role as a mentor and a developer to his subordinates. We were looking for leadership studies that had combined the evolving knowledge of mentoring and developmental networks. The analysis was conducted on three facets, beginning with Leadership & Mentoring, than adding Development Networks, and on the last facet- adding Complexity leadership.

The major conclusion of those analyses is that there is a gap in research and knowledge, regarding the topic of our research. All of VOSviewer maps are characterized by small numbers of items and weak strength of links. Most of the items of the Main authors were published more than 5 years ago, and there is a downward trend in publication on recent years.

There are few authors that were more cited, and their key words are of more relevance to the topic of this research:

- Groves (2007): Integrating leadership development and succession planning best practices
- Andre (2017): Students helping students: vertical peer mentoring to enhance the medical school experience
- Hafsteinsdóttir (2020): The leadership mentoring in nursing research program for postdoctoral nurses: a development paper
- Bolden (2011): Distributed leadership in organizations: a review of theory and research.

Managers and leaders of the *Era of Knowledge* should take a significant role as a mentor and a developer to their subordinates. I am suggesting a combined perspective, taking the best insights from both *Leadership* and *Mentoring* fields of study, In the benefit of the organization and the people working in it. The *Enabling leadership* 'way of thinking' that evolved from the complexity of the *Era of Knowledge* (Uhl-Bien et.al, 2017), is a possible way to combine the knowledge.

6. References

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