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Global Research on Andragogy: A Bibliometric Analysis

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Abstract

This study presents an overview of the published research in the field of andragogy using bibliometric methods. Scopus database produced a list of 698 manuscripts that were cited 2383 times with an average of 3.41 citations per publication. More than 89% of Scopus-based research on andragogy was published in the English language while 61% of this research was published in form of journal articles. Proceeding papers followed the journal articles in preferred types of publication that researchers opted to published their research in. The University of Ottawa was the most active institution publishing the highest number of publications followed by the Kent State University and Cape Breton University, respectively. Adult Learning was the journal that published andragogical publications the most. Publications on andragogy increased slowly during the 20th century, however, a steady increase was observed during the last decade, from 2010 to 2020. Single authorship is the most common authorship pattern. The keywords analysis revealed that the term andragogy was most frequently used in the author-provided keywords. Most of the studies on andragogy have been carried out by the authors affiliated with the United States and the United Kingdom.

Keywords

Andragogy, adult learning, bibliometrics, research productivity, bibliographic coupling

Introduction

While we have seen decades of work done by researchers in the field of pedagogy, andragogy is still in need of much attention from educators and researchers. Andragogy, for many researchers from the outsider's view, is just bluntly placing adult education. One of the main reasons for this is the lack of interest shown by many researchers who tend to be more inclined to research pedagogical practices for the younger audience. Andragogy on the other hand is a concept quite larger than just adult education. It encapsulates a vast array of traits that are possessed by the adult audience. Each of those traits can be researched separately to accomplish the adult learners' best possible education tools. Learning in adulthood has increasingly become a personal and intense activity (Merriam et al., 2007).

The term andragogy is a neologism formed by analogy with pedagogy and means to lead or educate adults (Krajnc, 1989). The term andragogy was first coined by Alexander Kapp, a German educator (Loeng, 2017). A word which literally means leading a man as opposed to pedagogy, which literally means leading a child. Kapp was a gymnasium teacher who researched extensively in developing different training tools. In his work titled "*Platon's Erziehungslehre, als Pädagogik für die Einzelnen und als Staatspädagogik. Oder dessen praktische Philosophie*" Kapp explores the work of Plato and chooses his work as the initiating argument for adult learning. Kapp's book has a separate part that explores adult learning and discusses its several traits that adult learners possess. He names these traits Andragogy. Kapp justifies the necessity of learning for adults and looks deeply into the needs of inner qualities rather than outer ones, which becomes the central theme of andragogy. Unlike the work of Howard Y. McClusky on the theory of margin (Wolflin, 1999), which largely looks at the overloaded adult learners andragogy observes several tenets that provide a far broader approach in both understanding the adult learning and developing tools for adult learn. Two of the other major theories, like Illeris three dimensions of learning (Illeris, 2002)

and Josey-Bass learning communities (Shapiro and Levine, 1999), also take a more specific view about creating adult the learning environment. Andragogy, on the other hand, puts the learner in the middle of it all to say.

Malcolm Knowles was a great proponent of both andragogy as a theory of adult learning as well as research in andragogy. In his report, he indicated that adults learn in informal ways (Knowles, 1950). Knowle felt that adult learners were neglected species and wrote about the lack of learning venues for adults (Knowles, 1990). He felt that most of the work that is being done in the field of learning and teaching is being done for a younger audience. Most of the techniques being applied for learning also take into the account the learning habits of much younger audience. This deficiency and neglect pushed Knowle in developing and further explaining the concepts behind andragogy. His work has managed to identify different elements of andragogy (Knowles, 1980, Lippitt and Knowles, 1984). Research has shown that adult learners modify their learning approaches as they age (Béchar and Toulouse, 1991). Knowles andragogy largely takes into consideration five elements that build the adult learning tenets.

1. Self-concept. The adults are self-responsible for situations, and their ownership of self plays an important role in their learning (Merriam, 2001, Smith, 2002). Ownership of learning. Self-direction, management, monitoring are broadly the values that drive them to take up an adult learning task (Knowles, 1975, Lippitt and Knowles, 1984). Forrest puts it as learning from the experience (Forrest III and Peterson, 2006).
2. The experience that is possessed by the adults shape the way the adults learn (Hägg and Kurczewska, 2019). In many ways, the younger audience lacks the experiences of adults and their knowledge has to be delivered by educators using tools and methods that may not work for adults.

3. The adult learner has a readiness to learn and has a timely, relevant, and focused view about the learning (Knowles, 1986).
4. Orientation to learn. They focus on tasks. Learning needs to be contextual and experiential learning is better (Knowles, 1989, Knowles et al., 2005).
5. Motivation to learn. This can be extrinsic in children. For adults, it can be intrinsic, like self-satisfaction. There is a need to know something (Houde, 2006).

In contrast to pedagogy that is a teacher-focused education model for children, andragogy is more self-directed and learner-focused in nature, where the teacher acts as a facilitator of learning instead of being a transmitter of knowledge (Taylor and Kroth, 2009). Andragogical methods are equally applicable for formal or informal education settings and have become a tool for facilitation adult learning. The model has widely been accepted by the majority of adult educators globally. Andragogy has influenced the adult learning practice to the extent that it has adopted the role of the window through which the educators see into the world of educating adults (Pratt, 1993). The approach is popular even outside the adult education circles and is employed in nursing, social work, law, business, and agriculture (Davenport and Davenport, 1985). Andragogy, as a field of scientific research, emerged initially in Europe and the United States in the 1920s and has seen three development phases since then. The first phase started with initial professionalization of the field and the start of study programs for adult education. In the US, Columbia University was the pioneer to a start study program in adult education in 1930, while the University of Nottingham was more proactive in Europe and established the first university chair in adult education in 1926. The second phase of development marked with the commencement of 16 university level programs in the United States and conceptualization of the foundations of adult learning was started in 1964. Since mid-1990s, the field witnessed a transition to the third phase of development with

merging of university programs with other disciplines and fragmentation of the field into subfields (Mikulec and Kump, 2018).

Bibliometrics is a widely used method to measure the research performance of individual researchers, R&D groups, labs, countries/regions, institutions and of particular subject areas. The method is used to observe the state of a field of research through measuring the production of scientific research. Bibliometric indicators are equally suitable for macro and micro levels of analysis and studies when used with usual precautions (Okubo, 1997). By providing empirical and evidence-based findings, the method can be an aid to allocation of funds, promotions and hiring of researchers and setting the future research agendas and priorities.

A great deal of learning can be made through analyzing the scientific output in a given field. Several bibliometric studies have been carried out covering various aspects and fields of educational sciences like medical education (Matthews et al., 2016, Wieland et al., 2013); engineering education (Williams et al., 2018, Xian and Madhavan, 2014); distance education (Amoozegar et al., 2018, Dan and Liangliang, 2012); electronic learning (Herrera et al., 2018).

The fact that the research field of andragogy has undergone various phases of developments and changes and has diversity in its research matters, concepts, methods and so on, yet, little is known about the current status and dynamics of its research yield. In view of this, we prepare this research study to map out the dominating research trends in published form of research in the field of andragogy with the following objectives:

- To know the language of the manuscripts published in the field of andragogy
- To identify the preferred types and sources of publications with their relevant impact indicators
- To know the most prolific countries/regions, institutions, and individuals

- To know the evolution of publications and citations in the field
- To know the authorship patterns in andragogical research
- To know the frequently used keywords and thematic evolution
- To know the collaboration between the countries

To carry out this research, the following types of bibliometric indicators were used to perform research analysis:

- Quantity indicators to quantify the volume of andragogical research and to measure the productivity of institutions, countries and researchers
- Quality indicators to determine the impact of published research
- Structural/relationship indicators to unearth the connections between authors, keywords, subject areas, and citations

Methodology

This study used bibliometric methods to explore the dynamics of andragogy research. The method is commonly used to evaluate the research performance in particular subject areas. The authors have applied the methods in several of their studies (Rogingya Crises - Mapping the Peer reviewed Literature (Meher et al., 2019); Mapping the Intellectual Structure of Linguistics Research Over 101 Years (1919–2020) (Rashid, 2021), Library and information science research in Pakistan: A bibliometric analysis, 1957–2018 (Siddique et al., 2020).

Selection of database is an important task in bibliometric studies. We selected Web of Science database as it is one of the most comprehensive abstract and citation databases of academic literature. Selecting the TS (topic search) option search option, a query with the input “andragogy*” was run in the Core Collection of Web of Science database on January 21, 2021. The query retrieved 749 records of publications. No filter of time span was applied to maximum recall of the results. We excluded the document types of book review, letter, editorial material, and meeting abstract to perform analysis on the peer-reviewed document only. After applying the document types filter, 701 records were selected for further

assessment. Duplication of the records was checked in Endnote software matching the titles, authors and publication years of the records. Three duplicate records found and were removed from the list. Finally, 698 records were selected to perform the bibliometric analysis. The data was downloaded in file formats of plaintext, tab delimited, pajek, plaintext and ciw. The tools, like, VOSviewer, Biblioshiny, MS Excel, Endnote, MS Access and Notepad were used to process and visualize the results.

Data Analysis

Language of publications

The language of publications on andragogy is presented in Table 1. The data shows that a large majority of publications have been published in the English language distantly followed by Spanish and Russian. All the remaining publications in the other languages in the table produced less than ten publications each. The further analysis of the data by the HistCite software ranked the English language at the top in receiving the highest total local citation score (TLCS) and total global citation score (TGCS). The remaining languages either did not receive any score or received less than ten scores in each case.

Table 1 Language of publications

#	Language	TP	TLCS	TGCS
1	English	623	172	2348
2	Spanish	23	0	8
3	Russian	12	1	3
4	Slovak	9	0	0
5	German	6	0	6
6	Czech	4	0	7
7	French	4	1	3
8	Polish	4	0	6
9	Portuguese	4	0	2
10	Lithuanian	2	0	0

TP= total publications; TLCS= total local citations; TGCS= total global citations

Document types of andragogy research publications

Table 2 presents the type of documents published in the andragogy research. It is evident from the data that the researchers on the topic preferred document type ‘Article’ to share their research with the other researchers in the field, followed by ‘Proceedings Paper’. The analysis regarding TLCS and TGCS also ranked document type ‘Article’ at the top position, followed by ‘Proceedings Paper’ and ‘Review’. The document type ‘Article; Proceedings Paper’ also obtained a reasonable TGCS as compared to the document type ‘Article; Early Access’.

Table 2. Documents types in andragogy research.

Document Type	TP	TLCS	TGCS
Article	428	157	1913
Proceedings Paper	229	11	166
Review	19	4	236
Article; Early Access	12	0	1
Article; Proceedings Paper	10	2	67

Most productive authors

Table 3 highlights the most productive authors in andragogy research. The data was sorted on total publications (TP), TLCS, and TGCS. The analysis ranked Callary B and Young BW at the top position with an equal number of publications, total local and global citation scores. Sato T and Muresan M also contributed six publications each but obtained fewer total local and global citation scores. Similarly, four authors in the table each published five publications on the topic with zero TLCS. Among these four authors, three received two, and one did not obtain any global citation score. It is interesting to note that the last two authors in the list secured good total local and global citation scores, although they produced fewer publications on the topic.

Table 3. Most productive authors

Author	TP	TLCS	TGCS
Callary B	6	11	20
Young BW	6	11	20
Sato T	6	6	36
Muresan M	6	0	8
Beltran P	5	0	2
Cedillo P	5	0	2
Rodriguez-Ch P	5	0	2
Pavlov I	5	0	1
Haegele JA	4	6	35
Milligan F	3	6	43

Influential institutions

Table 4 presents the top 20 influential institutes producing publishing on the topic. The data was sorted on TP then on total citations (TC). The analysis ranked ‘University Ottawa’ at the top position with nine publications and 24 citations, followed by ‘Kent State University’ and ‘Cape Breton University’ seven publications each but different number of citations. The data ranked ‘Griffith University’, ‘Elon University’ and ‘University Amsterdam’ at 18th, 19th and 20th position with three publications each but with different citation scores.

Table 4. Top 20 influential institutions

Rank	Institution	TP	TC	NCP	C/P	H-Index
1	University Ottawa	9	24	5	2.67	4
2	Kent State University	7	49	6	7	4
3	Cape Breton University	7	20	4	2.86	3
4	Massey University	6	31	6	5.17	3
5	Dimitrie Cantemir Christian University	6	8	3	1.33	2
6	University Maryland	5	193	5	38.6	3
7	University British Columbia	5	19	3	3.8	2
8	University Tennessee	5	11	2	2.2	1
9	University Cuenca	5	2	2	0.4	1
10	University Pendidikan Indonesia	5	0	0	0	0
11	Old Dominion University	4	35	4	8.75	3
12	Queensland University Technology	4	32	3	8	3

13	University Florida	4	22	3	5.5	2
14	Florida Atlantic University	4	12	4	3	3
15	Islamic Azad University	4	10	2	2.5	2
16	Texas A&M University	4	4	2	1	2
17	University Valencia	4	3	2	0.75	1
18	Griffith University	3	31	2	10.33	2
19	Elon University	3	17	2	5.67	2
20	University Amsterdam	3	14	3	4.67	2

Publications (TP), total citations (TC), number of cited publications (NCP), citations per publication (C/P), and the h-index (h)

Top journals publishing andragogy research

The most productive journals publishing research related to andragogy have been presented in Table 5. The journal ‘Adult learning’, which started publishing on the topic in 2015, ranked as the top year producing research on the topic followed by ‘Nurse education today’, ‘Adult education quarterly’ and ‘International journal of adult vocational education and technology’. The data also revealed eight journals that have equally contributed four publications and ranked at the bottom of the list. The further analysis regarding the number of citations received by any journal, ranked ‘Nurse education today’, ‘Adult education quarterly’ and ‘Policing-an international journal of police strategies & management’ at first, second and third positions.

Table 5. Top journals publishing andragogy research

Source	h_index	g_index	m_index	TC	NP	PY_start
Adult learning	3	4		25	12	2015
Nurse education today	7	9	0.26	136	9	1995
Adult education quarterly	4	8	0.11	115	8	1985
International journal of adult vocational education and technology	3	3	0.43	13	8	2015
E-mentor	1	1	0.2	1	6	2017
Nurse education in practice	5	5	0.625	61	5	2014
Journal of advanced nursing	3	5	0.1	45	5	1992
Policing-an international journal of police strategies & management	3	4		89	4	2003

European journal of training and development	3	4	0.5	38	4	2016
Professional development in education	2	4	0.33	24	4	2016
International journal of lifelong education	2	3	0.4	11	4	2017
Journal of applied research in higher education	2	3	0.33	9	4	2016
Journal of continuing higher education	1	3		9	4	2016
Journal of adult and continuing education	2	2		4	4	2017
Research journal of pharmaceutical biological and chemical sciences	1	2	0.16	4	4	2016

TP= total publications; NP= number of publications; PY_start= publication year start

Evolution of andragogy publications and citations

The yearly growth of the publications on andragogy research has been presented in Figure 1. The data indicates a little slow growth initially with 808 publications from 1964 to 2007 with an average of 18 publications per year. The figure's data highlights an increasing trend since the year 2015 with the peak year 2017 when the highest number of publications (104) were contributed to the body of the literature. After that, a tiny downward trend has also been observed with slightly fewer publications contributed in the remaining years. The further analysis regarding the citations received ranked the year 2016 with the highest citations (223), followed by 2018 and 2017.

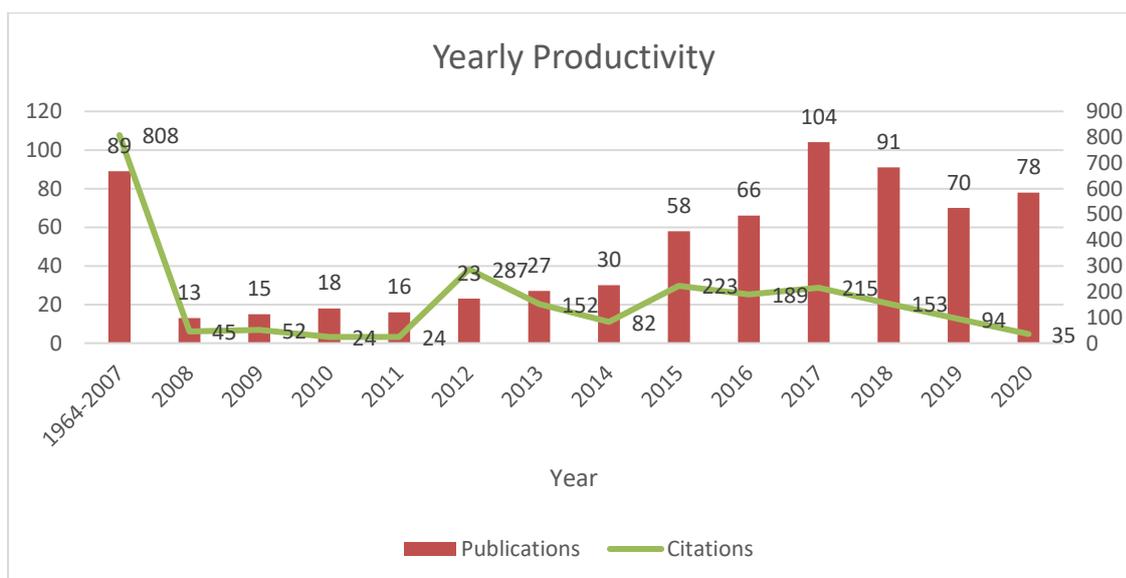


Figure 1. Evolution of andragogy publications and citations between 1964 and 2020

Authorship pattern

The authorship pattern in andragogy research has been shown in figure 2. The data revealed that the single-author pattern is the most favorite pattern of the researchers on the topic, with the highest number of publications followed by two-author and three-author patterns. The data ranked seven, nine, eleven, and twelve author patterns at the bottom of the list due to fewer publications by each pattern. The analysis regarding citations also ranked single-author pattern at the top position with over 1000 citations followed by two and three author patterns.

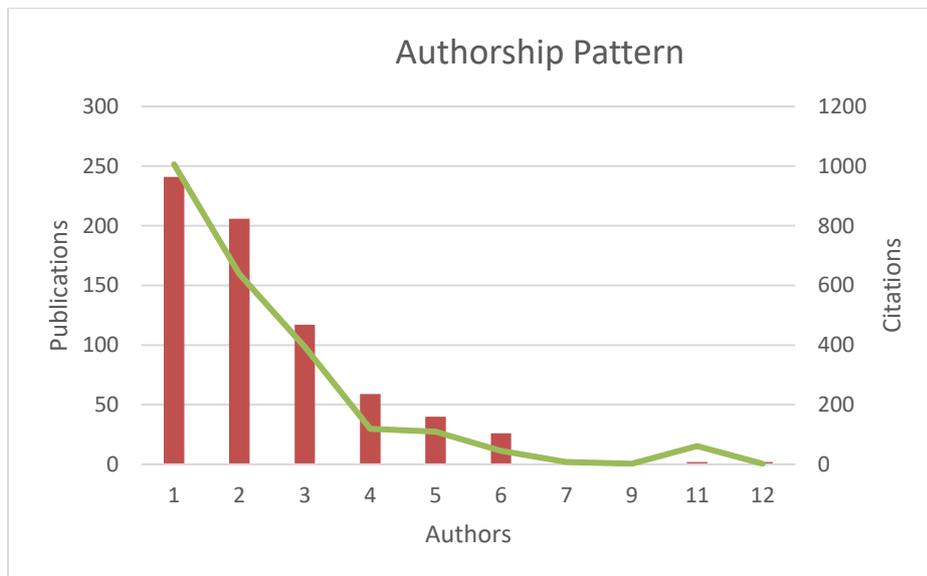


Figure 2. Authorship pattern of andragogy research

Figure 3 provides the temporal evolution of themes of andragogy research over the period from 1964 to 2020. The analysis divides the period into three different times slices to demonstrate the evolution. The size of the box indicates the occurrences of frequency of the themes and keywords. The keywords “andragogy”, “education” and “e-learning” were the most popular during the first four decades of the andragogy research. “Andragogy” remained popular throughout the period, i.e. 1964 to 2020. “Knowledge”, “life-long learning”,

“practice” and “transformative learning” were the new keywords emerged more recently during the period from 2016 to 2020.

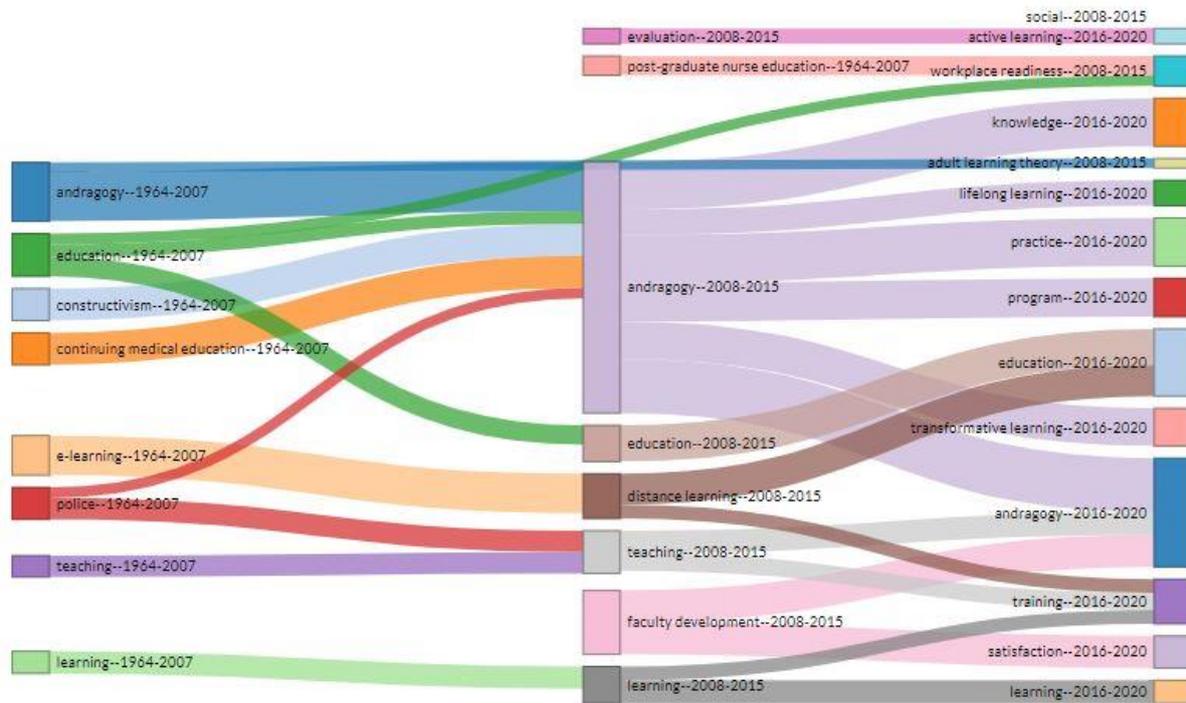


Figure 3. Thematic map of keywords evolution.

Using VOSviewer software, network of the most frequently used keywords in andragogy research is visualized (Figure 4). Figure reveals that “andragogy” was the most prominently figured anchoring the cluster 6 represented in yellow colour. Adult learning, pedagogy, E-learning, adult education, constructivism, and heutagogy were the other keywords appeared prominently in the figure leading their respective clusters. Seven different colours in the figure represent seven different clusters.

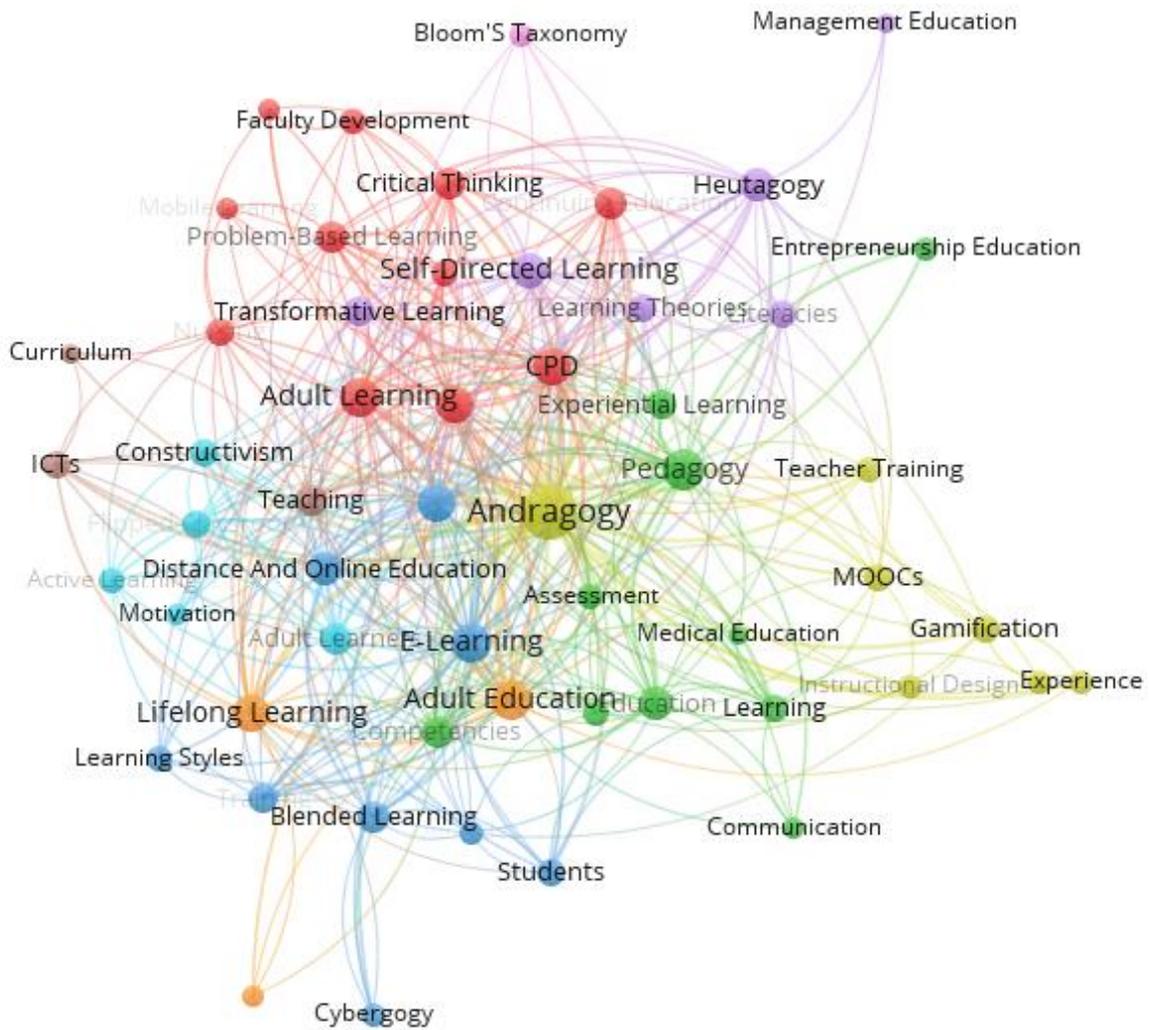


Figure 4. Frequently used keywords in andragogy research.

Figure 5 presents the bibliographic coupling of the countries publishing the andragogy research. A bibliographic coupling happens when two sources cite a third common document. The technique determines the connections between two countries by assessing the degree of citing the same documents. United States and the United Kingdom were the most prominent countries and were present in the same cluster. Canada, Australia and New Zealand formed another prominent cluster. Seven different colors represent seven different clusters.

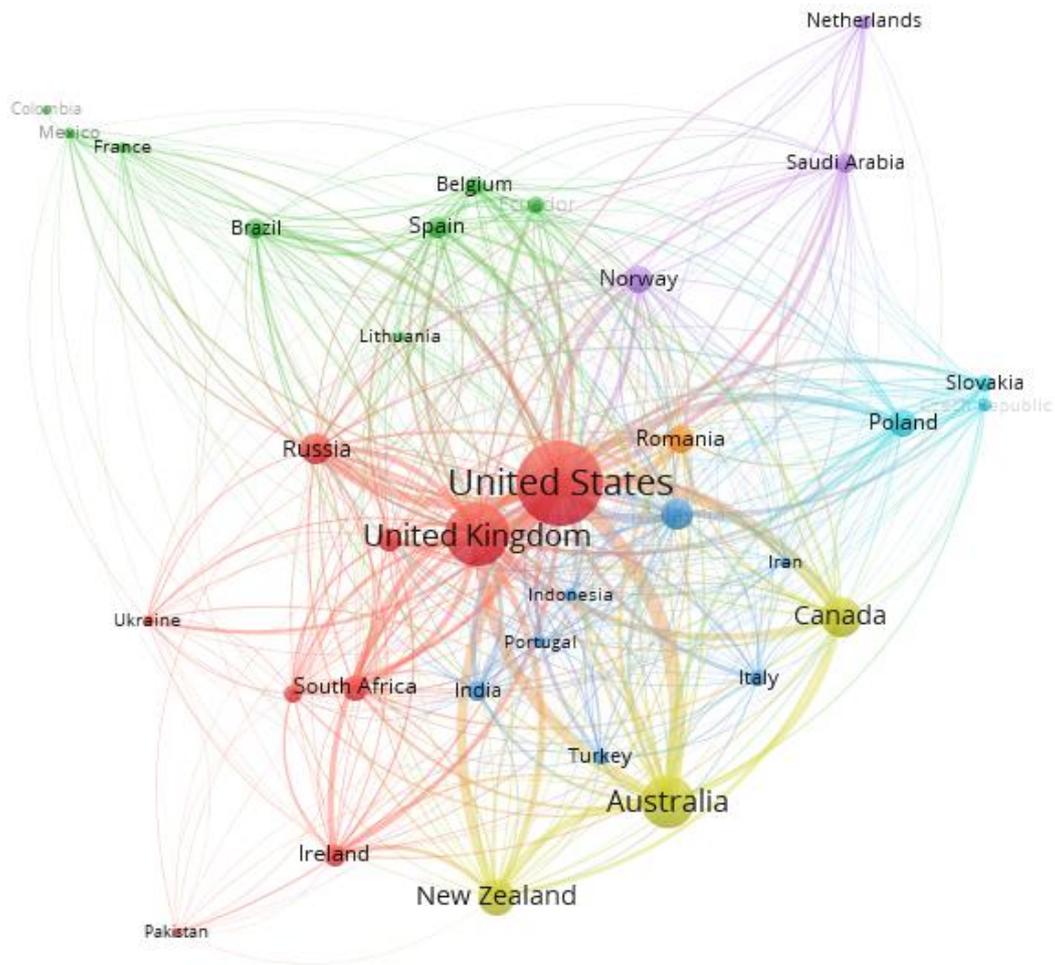


Figure 5. Bibliographic coupling of countries in andragogy research.

Seventy-one countries from around the world collaborated in andragogy research.

Figure 6 presents the network map of countries producing the andragogy research. The map shows the relationships between various countries collaborating in the field of andragogy. Of the seventy-one countries that contributed in andragogy research, the United Kingdom was at the centre of the map closely collaborating with Australia and the United States. Significant level of collaboration was also detected between Australia and New Zealand, United States and Canada, Netherlands and Egypt, Germany and Spain, Belgium and Russia, and Sweden and Poland.

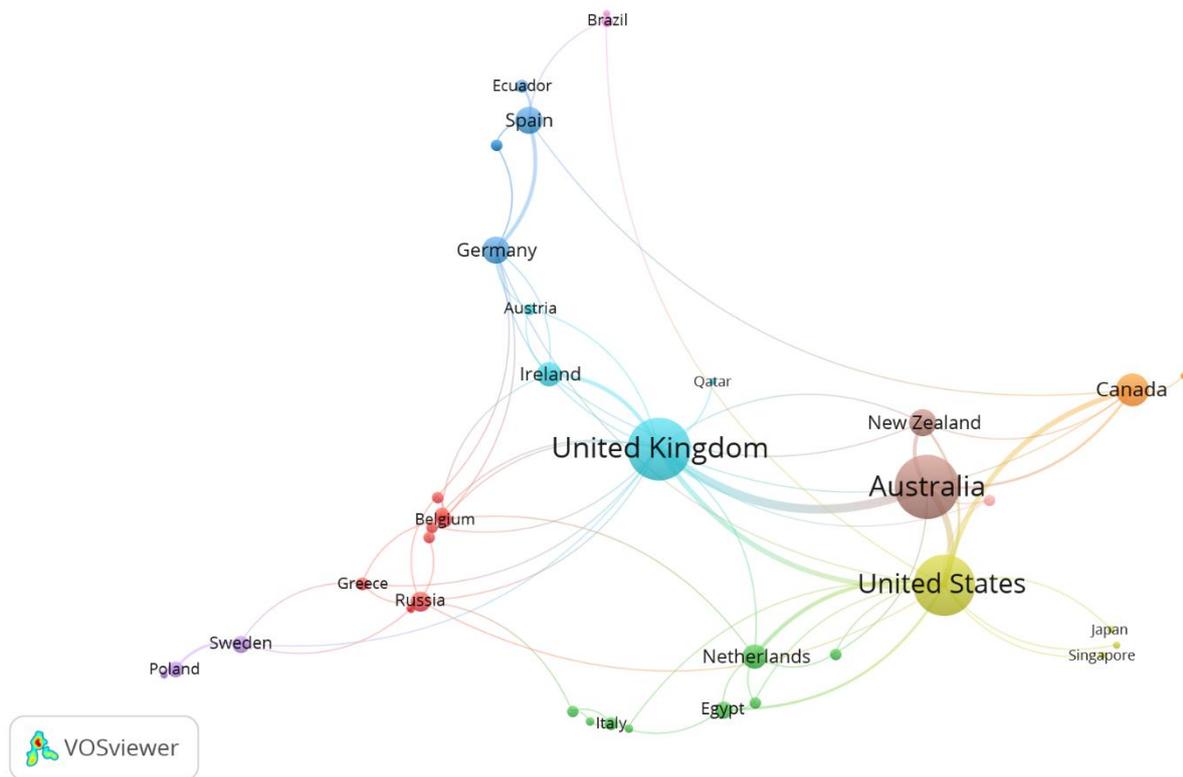


Figure 6. Countries collaboration in andragogy research

Conclusion

Despite being a very important topic, it is clear from the data generated and analysed that the research contribution in the field of andragogy is still lacking a lot. The research shows the spike in activities in some countries while very little activity in this field in others. Most of the research being generated in andragogy is being done in United States, United Kingdom and Australia. It seems from the data that there is a steep decline in research after these three countries. Since bibliometric research largely deals with quantitative analysis, it is very difficult to understand while this steep decline is there after these three countries. There could be any number of reasons ranging from not enough funding, not enough interest, relevance and importance but these reasons can only be examined through qualitative research. This research has provided a talking point for qualitative researchers to further examine the reasons behind very little work done in the field of andragogy. Further analysis through qualitative research may help us understand why the level of research in the

field of andragogy is so less in some countries despite adult learning being a very important factor in the workforce. Qualitative research would also further unearth those very specific reasons which if cured could improve the field of both andragogy and adult learning processes. The quantitative bibliometric analysis has shown that more you move away from the western world the research in the field of andragogy keeps getting lower results again there could be any number of reasons for such a result. This scarcity of research in Asian universities and African institutes may have its roots in many internal and external factors that can only be calculated through deeper qualitative analysis of reasons that contribute in this minimum research. This article has quantitatively shown that the research in the field of adult learning and andragogy despite having gained so much traction in the 20th century is still much less than many other educational fields. It is recommended that a further qualitative study be conducted which should be area specific and Institute specific to unearth the reasons behind low research productivity in the field of andragogy.

Limitations and Future Research Directions

This study was based on the data retrieved from the Scopus database. The other citation and abstract databases like, Web of Science and Google Scholar may present different set of publications and citations on andragogy. This study recommends future studies using Web of Science and Google Scholar databases.

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