A bibliometric analysis of academic literacy: a review of the state of the art, from the past to the future

Análisis bibliométrico de la alfabetización académica: una revisión del estado del arte, del pasado al futuro

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Abstract

Purpose: The current discourse on productivity research in academic literacy has increased in the last quinquennium. This research aims to illustrate the application of academic literacy in various fields of study that include educational research and linguistics and show its evolution in literary production. ***Design/methodology/approach:*** Web of Sciences (WoS), one of the databases of citations and summaries of different kinds of literary productions, was used for this bibliometric analysis to collect data recorded since the first document on academic literacy appeared in 1989 until mid-2020. The results downloaded were analyzed using specific parameters. Excel was used to analyze the recovered data and VOSviewer to visualize the network map distribution of academic citation by country, bibliographic coupling by source, co-citation by cited authors and co-citation by cited references. The descriptive bibliometric approach allows for tracking intellectual outputs and describing or evaluating their nature and evolution. ***Findings:*** WoS records dissimilar types of documents, such as articles, book reviews, editorial materials, corrections, meeting abstracts, notes, etc. There were 866 publications, which received 8,767 citations, *Teaching in Higher Education* published the most articles (34), followed by *Journal of English for Academic Purposes* (28) and *Journal of Academic Language and Learning* (26). The term "Academic Literacy" appears most commonly as the author keyword. ***Originality/value:*** The study is the first bibliometric analysis about academic literacy to highlights how it has evolved over the last 31 years. This bibliometric analysis confirms a remarkable growth of academic literacy in

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research publications and scientometric performance that differ from education research and linguistics.

Key words: academic literacy, academic alphabetization, academic writing, bibliometric analysis, WoS.

Resumen

Propósito: El discurso actual sobre la investigación de la productividad en la alfabetización académica se ha incrementado en el último quinquenio. Esta investigación tiene como objetivo ilustrar la aplicación de la alfabetización académica en diversos campos de estudio que incluyen la investigación educativa y la lingüística y mostrar su evolución a nivel de producción científica. ***Diseño / metodología / enfoque:*** Web of Science (WoS), una de las bases de datos de citas y resúmenes de diferentes tipos de producciones literarias, fue utilizada para recolectar los datos registrados desde que apareció el primer documento sobre alfabetización académica en 1989 hasta mediados de 2020. Los resultados descargados se analizaron utilizando parámetros específicos. Se utilizó Excel para analizar los datos recuperados y VOSviewer para visualizar la distribución de mapas de redes de las citas académicas por país, el acoplamiento bibliográfico por fuente, la co-citas de los autores citados y la co-cita de las referencias citadas. El enfoque bibliométrico descriptivo permite rastrear los resultados intelectuales y describir o evaluar su naturaleza y evolución. ***Recomendaciones:*** WoS registra diferentes tipos de documentos, como artículos, reseñas de libros, materiales editoriales, correcciones, resúmenes de reuniones, notas, etc. Hubo 866 publicaciones, que recibieron 8,767 citas, *Teaching in Higher Education* publicó la mayoría de los artículos (34) seguido por *Journal of English for Academic Purposes* (28) y *Journal of Academic Language and Learning* (26). El término "alfabetización académica" aparece más comúnmente como la palabra clave del autor. ***Originalidad / valor:*** El estudio es el primer análisis bibliométrico sobre la alfabetización académica que destaca cómo ha evolucionado durante los últimos 31 años Este análisis bibliométrico confirma un notable crecimiento de la alfabetización académica en las publicaciones de investigación y el desempeño cienciométrico que difiere de la investigación en educación y la lingüística.

Palabras clave: alfabetización académica, redacción académica, análisis bibliométrico, WoS.

Introduction

Academic institutions are increasingly interested in developing competent professionals for a globalized market. Therefore, the constant improvement of teaching in their institutions is one of their main objectives. As a result, academic literacy can encompass academic life's social and cultural aspects and research and socializing academic skills (Barth et al., 2007). All higher education institutions should take this challenge to reconsider their actual learning processes, endorse a new learning culture based on competence, and improve student deficiency by maintaining constant mentoring and supervision.

Various researchers recognize an inherent emotional endeavor as a characteristic of academic life (Hughes & Smail, 2014; Pym & Kapp, 2013). In academia, fostering a sense of identity within a research program is critical for students (Pennington et al., 2018). Academic literacy is based on reading and writing, which are the two crucial pillars for students' cognitive process. These disciplines are essentially social and communicative practices that have turned into an ideological battle concerned with how to teach them adequately during the last decades.

Reading and writing are among the basic linguistic skills, but these skills should be more developed in an academic community. Every reading or writing experience requires historically evolved and culturally integrated ways of communicating to fulfill a specific social or cultural function (Gee, 1999; Lee, 1995; Moje et al., 2000; Scribner & Cole, 1981). Hyland and Tse (2007) mention that the academic community's conventional recognized steps or movements permeate literacy texts. Also, linguistic features or typical patterns emerge from salient disciplines. Few recent research has advocated incorporating academic literacy in teaching areas that describe the principles of an egalitarian mode of teaching in the different fields (Wingate, 2016). However, an increase in the production of documents on academic literacy will contribute to this model. Poor academic performance is related to inadequate literacy and language skills, which can be seen in the low GPA results (Rienties et al., 2012).

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State of the art on Academic literacy

The current theory of academic literacy comes from Street's ideological literacy model (1984). He considers literacy an ideological practice intertwined between society, culture, and power, not as autonomous knowledge that resides in people's. Later in his work, he introduced the idea of "academic literacy", arguing that there are many types of literacies in the academy, with ontological positions linked to cognitive practice (Barton, 2001). When contemplating the social meaning and usage of the broader text of development, traditional scholarly literacy goes beyond "text", which is analogous to works that inherently connect political and social contexts with literacy (Freire, 1970; Weng, 2016).

Academic literacy is described as the ability to communicate capably in academic debate (proficiency in reading comprehension and academic writing about literacy topics) refers to academic literacy. However, the academic community requires this capacity for epistemological knowledge of the genres; also, the scientific community collaborates with some conventions regulating these interactions (Porter, 2017). Understanding academic literacy requires two main implications, according to Calvo et al. (2020). Firstly, they mention that all students in an educational context must obtain this academic literacy, whether they speak their native language or not. Secondly, they note that it is challenging to acquire this academic literacy outside the community where they operate. Therefore, academic experts must offer support and instruction to all students (Wingate, 2016).

In Fischer's (2008) definition, academic literacy is proficiency in specific ways of thought, performing, reading and writing. Those are also characteristics of any social context, and that this fluency is learned through constant participation in academic literacy practices. Existing research on the topic of educational literacy advocate seeing it as a social practice, as opposed to merely defining it as a set of skills included in reading and writing (Lea & Street, 2006; Tapp, 2015). Academic literacy is defined by Yancey (2009) as the capability to: a) write for various aims, onlookers, and instances, b) approach, perform and assess the data, c) apply critical thinking skills, d) ponder one's yield, and e) provide further texts and acquaintance.

Although researchers on the conceptual development of academic literacy in disciplines like Education & Educational Research or

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Linguistic have had a considerable growth, other fields continue to be poorly investigated (Hunter & Tse, 2013; Wingate, 2010). In recent years, researchers have developed some studies in academic literacy in different disciplines that cover educational areas such as Nursing (Glew et al., 2019; Hillege et al., 2014; Ramjan et al., 2018), Psychology (Guzmán-Simón et a., 2017), Information Science and Library Science (Adams et al., 2016), Literature (Franco & Castanheira, 2016), Engineering (Skinner & Mort, 2009), Sociology (Black & Rechter, 2013; Riggs, 2008), Audiology & Speech-Language Pathology (Qualls et al., 2003), Anthropology (Erdreich & Rapoport, 2002) and other topics (Calvo et al., 2020; Moore et al., 2019).

In the teaching and learning process, information and communication technologies as digital tools have been growing. These have been diversifying interaction patterns and increasing levels of participation by students. The results have been seen as positive as it documents their writing skills. For example, according to Rocco (2010), students frequently use blogs and encourage self-reflection to continue learning through online interaction, helping them broaden their perspectives on academic topics. However, when it comes to composition processes about reading and writing, the researchers tend to focus on using online technology for formative assessment, which will result in a written text.

Based on the information mentioned above, we can ask ourselves how was the evolution of academic literacy production? and what other disciplines are being studied than differ of education and linguistic? to have a greater understanding of reading comprehension and technical writing abilities.

About reading comprehension

Nowadays, most institutions dedicated to teaching mention that reading comprehension is a basic need for educational programs (Zaccoletti et al., 2020). Extracting meaning from written text has been identified as a difficult challenge by many scholars. According to Hoover and Gough (1990), reading comprehension (R) results from decoding capacity (D) and language comprehension (C), developing the next equation: $R = D \times C$. As a result, reading comprehension success is expected by decoding and linguistic comprehension abilities. Other authors also noted that

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lower-level decoding abilities and reading capacity are highly foreboding of reading understanding (García & Cain, 2014; Kendeou et al., 2009; Vellutino et al., 2007). However, in adults and qualified readers, lower-level comprehension skills' contributions are reduced (Landi, 2009; Tilstra et al., 2009).

Numerous studies have shown the critical importance of word awareness in academic literacy's intellectual growth (Baba, 2009; Engber, 1995). Qian (2002) evaluated the impact of vocabulary skills on reading comprehension in university students' learning contexts. With so much emphasis placed on university officials' student readiness, especially on academic literacy, it's fair to ask why so many scholars reach this level of study without a suitable understanding of the literacy rigors that the courses demand. This is a constant question that most academic authorities ask themselves when receiving new students in each new period of teaching.

It's meaningful to have a better understanding of what expectations about academic literacy include. In 1983, as part of Doyle's study, it was estimated that more than 80% of academic college-level assignments involve reading practice. On the other hand, Holschuh's research (2019) mentions the value of examining demands of academic literacy tasks and other academic tasks in general. Academic literacy assignments encompass works that involve reading and writing and that are based on various broader practices. So, this field's duties are usually developmental, multidimensional, goal-centered, and involve more than a sequence of basic cognitive abilities. A social approach consists of the reader as the broader community context and results from work in a contextualized learning environment (Porter, 2017; Weng, 2016).

From a technological point of view, Pachler et al. (2010) inform on an academic training task to develop wiki documents that describe reading comprehension strategies. Wikis, on the other hand, are often correlated with collective writing and diverse ventures (Li & Zhu, 2013), and they note that e-portfolios and rubrics often replicate the conventional function of paper portfolios, which are meant to track and record learning and achievement (Godwin-Jones, 2008).

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About academic writing

Silverman et al. (2015) highlights the importance of mastering the first language in all aspects of the discipline, together with particular understandings of the culture to which it belongs. Without this deeper comprehension of the language results in academic literacy will be extremely difficult. Much of the research done on academic literacy uses holistic general quality measures (Dobbs, 2013; Uccelli et al., 2013). Generally, these measures cannot always capture students' variability nor provided relevant information to teachers about methodologies that can help improve their students' academic writing skills. Xie (2016) used a systematic grasp to measuring a students' writing level based on five themes: subject-matter, setup, grammar, vocabulary, and mechanics.

It is well known that the challenges students encounter with academic reading are evident in their written assignments and are mistaken for language difficulties. Teachers can often not identify the academic literacy problems underlying student essays (Lea & Street, 1998). Therefore they attribute poor performance to characteristics such as spelling, grammar, and the educational structure itself. What contributes to literacy skills is an absence of awareness of students' learning needs. However, some studies report that academic literacy works best in developing the academic skills of reading comprehension and writing (Lea & Street, 1998).

In a more current study, Li and Hu (2016) mention that teachers who instruct directly (giving examples in their classes) and indirectly (providing feedback in academic training) obtain better results in writing practices. They also mention that scaffolding is a widely used educational technique by students, where it encourages graduate students to use their sources of meaning. It is noted that three types of knowledge are required for the development of academic writing: academic writing skills, content knowledge, and academic rhetorical knowledge.

Methodology

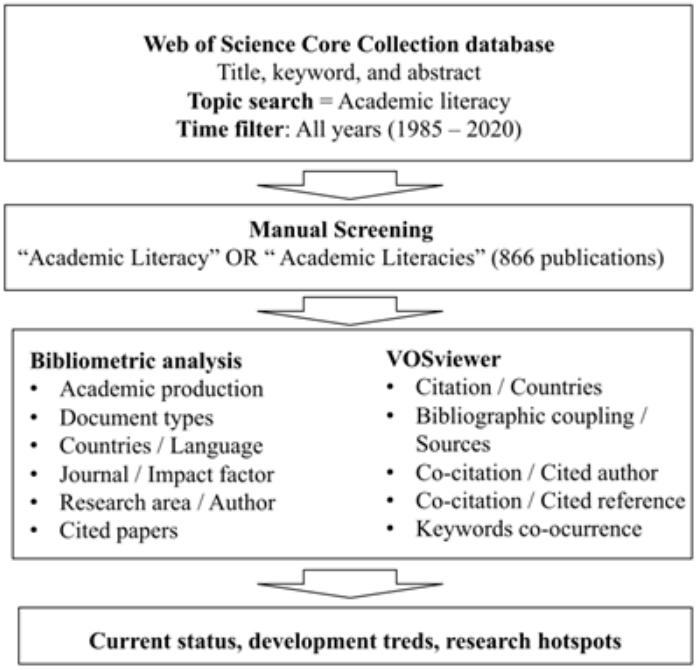
Bibliometrics is a science branch that focuses on quantitatively analyzing bibliographic data on a specific topic (Broadus, 1987; Choudhri et al., 2015; Gil et al., 2020). It focuses on general scientific production, the scientific production by country, language, several citations, affiliations

of the authors, impact factor of the journals, research areas, and keywords. Bibliometric study results can be viewed differently, such as maps, tables, charts, figures, graphics, and distribution networks that allow large data sets to be represented meaningfully. Numerous scholars regard bibliometrics as a mathematical technique for evaluating and quantifying the volume of work generated on a particular subject and its development rate (Mao et al., 2018; Soosaraei et al., 2018). In the present study, the free access software VOSviewer (Van Eck & Waltman, 2010; Van Nunen et al., 2018) was used to analyze and visualize the geographic distribution, authorship, number of cites, and keywords (Author keywords and KeyWords Plus) related to academic literacy; the references cited in the publications highlight a journal impact factor (JIF) that indicates the journal's influence (Mao et al., 2018) by the journal citation report (JCR) which is an analysis tool included in WoS. Along with the publishers, they are assigned an H index, which means a time span during which at least *h* publications by an author, country, journal, institution, among others, have been cited at least *h* times (Mao et al., 2018; Yin et al., 2018). The sources quoted in the publications include a sizable corpus that must be analyzed to comprehend science growth (Bornmann & Mutz, 2015).

In this study, the journal impact factor is determined by the JCR in its last evaluation of 2019, which is used to evaluate the impact of journals related to academic literacy documents. In a network analysis, one can visualize the complicated social relationship between countries / territories, authors, keywords, among others (Wu et al., 2018). The JCR provides two other critical bibliometric indicators compared to Scopus, the 5-year Impact Factor, which uses the same formula as the impact factor (IF) but expanding the citation window to 5 years, thus trying not to harm those areas in which that the time that elapses between publication and citation is longer. The literature does not include age as fast (Jacsó, 2009), and the Immediacy Index, which measures the promptness or speed with which the literature is cited. However, comparative bibliometric analysis from scientific production in the area of academic literacy are missing. Excel was used to make the publication summary tables by year, by country, by language and other topics. The extracted data used in this come from the Web of Science Core Collection database, which included the Book Citation Index, Citation Index Expanded (SCIE), Sciences Citation Index (SSCI), Arts & Humanities Citation Index (AHCI), ISI Proceedings-Science

& Technology (ISTP) and ISI Proceedings-Social Sciences & Humanities Edition (ISSHP). The entire flowchart of the research for this study is shown in figure 1. The term "Academic Literacy" was determined as a primary subject, and the selected period was set from 1985 to mid 2020. In total, 866 documents on academic literacy were found that have been evaluated in this bibliometric study.

FIGURE 1. Flowchart of bibliometric analysis on Academic Literacy



Academic literacy dates back from 1989, when Hiebert and Calfee first mentioned it in their article Advancing Academic Literacy Through Teacher Assessments. Academic literacy in different fields was investigated, and little by little, more work was done from research to the last document published by Cervetti et al. (2020), denominated *How the Reading for Understanding Initiative's Research Complicates the Simple View of Reading Invoked in the Science of Reading* in AUG-2020. It is worth mentioning that a document created in 1985, where academic literacy

was mentioned in the article *Benchmark to Academic Literacy: Criterion Reference Testing in College Reading* by Smith and Elifson in 1985 does not appear in WoS database, so it is not including in our bibliometric analysis.

Results

Output of the publications

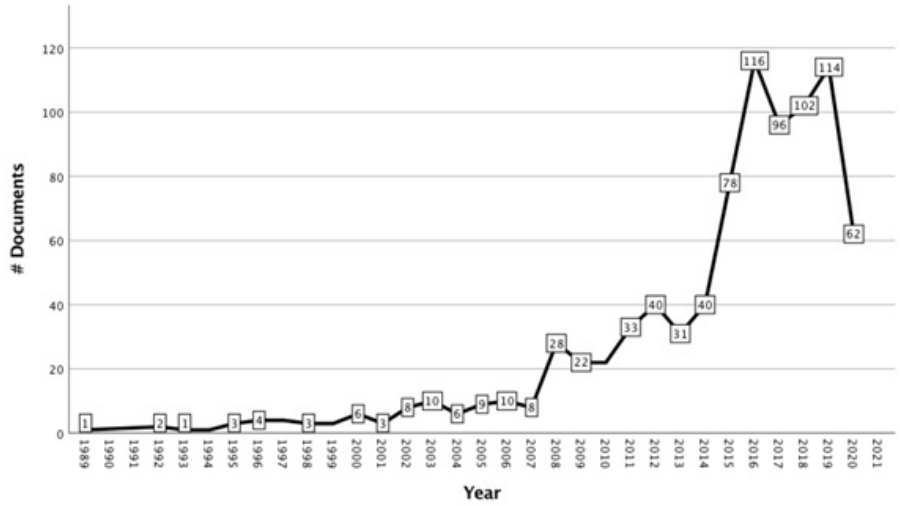
Li and Hale (2016) recommend for the production of the publications use the Boolean chains. It is chosen was: Topic: "academic writing" AND "reading comprehension" OR "Academic literacy" OR "Academic literacies" OR "Academic alphabetization" in the WoS database. The temporary search period ranges from the first paper on academic literacy, which was published in 1989 on the WoS database, until September 13th, 2020. No documents on academic literacy were published in 1990 and 1991. It was not a common theme before 2008, but is aligned with the increase of journals that entered the database. The publications number has increased significantly since 2015, with the highest number (116) reported in 2016, as seen in table 1 and figure 2.

TABLE 1. Numbers of documents on Academy Literacy in each year

Year	Record count	Percentage (%)	Year	Record count	Percentage (%)
2020	62	7.16%	2004	6	0.69%
2019	114	13.16%	2003	10	1.16%
2018	102	11.78%	2002	8	0.92%
2017	96	11.09%	2001	3	0.35%
2016	116	13.40%	2000	6	0.69%
2015	78	9.01%	1999	3	0.35%
2014	40	4.62%	1998	3	0.35%
2013	31	3.58%	1997	4	0.46%
2012	40	4.62%	1996	4	0.46%
2011	33	3.81%	1995	3	0.35%
2010	22	2.54%	1994	1	0.12%

2009	22	2.54%	1993	1	0.12%
2008	28	3.23%	1992	2	0.23%
2007	8	0.92%	1991	-	0.00%
2006	10	1.16%	1990	-	0.00%
2005	9	1.04%	1989	1	0.12%
			Total	**886**	**100%**

FIGURE 2. Evolution on Academic Literacy production on WoS database



After selecting the 866 documents, they were classified according to their document type, as seen in table 2. The publications contained nine distinct document type. Journal articles (794) were the most widely used type of document, representing 91.69% of all publications, followed by book reviews (38; 4.39%), reviews (20; 2.31%), editorial materials (10; 1.16%), proceedings papers (5; 0.58%), meeting abstracts (2; 0.23%); corrections (1; 0.12%) and notes (1; 0.12%). It also includes 18 early access (2.08%) that appeared next to other articles but did not count as a document type.

TABLE 2. Approaches on Academic Literacy document types

Document types	Record count	% of 866
Article	794	91.69%
Book review	38	4.39%
Review	20	2.31%
Early Access	18	2.08%
Editorial Material	10	1.16%
Proceedings Paper	5	0.58%
Meeting Abstract	2	0.23%
Correction	1	0.12%
Note	1	0.12%
Total	**866**	

Geographical distribution analysis

Academic literacy publications were analyzed according to the authors' affiliations in order to determine the distribution of countries/territories. Academic documents on academic literacy are found in 63 countries/territories. Of 866 documents concerned with academic literacy, 50.81% were provided by three countries: the USA, South Africa, and Australia. In table 3, the top ten most active countries are listed according to the total number of documents generated, along with additional information about the authors: single country, international collaborative, first author, and corresponding author. The United State (179; 20.67%) is the most prosperous region, followed by South Africa (138; 15.94%), Australia (123; 14.20%), England (104; 12.01%), Canada (45; 5.20%), Spain (40; 4.62%), Brazil (32; 3.70%) and Peoples R China (31; 3.58%).

TABLE 3. Top 10 countries on Academy Literacy papers

Rank	Country	Record count	% of 866
1	USA	179	20.67%
2	South Africa	138	15.94%
3	Australia	123	14.20%
4	England	104	12.01%
5	Canada	45	5.20%
6	Spain	40	4.62%
7	Brazil	32	3.70%
8	Peoples R China	31	3.58%
9	Sweden	23	2.66%
10	Chile	21	2.43%

On the other hand, in figure 3, it can see that there are links in the production of documents between countries that have produced the most about academic literacy. However, it can be seen that few countries like Netherlands, Finland, Norway or New Zealand, having less production than Chile, have more strength link with other countries who have more presentation on academic literacy. However, 14 records (1.62%) do not contain data in the field being analyzed. The most significant number of papers made on academic literacy was in English (752), second and third places are Spanish (76) and Portuguese (27) as shown in table 4.

FIGURE 3. VOSviewer network map of Citation/Country based on documents weight

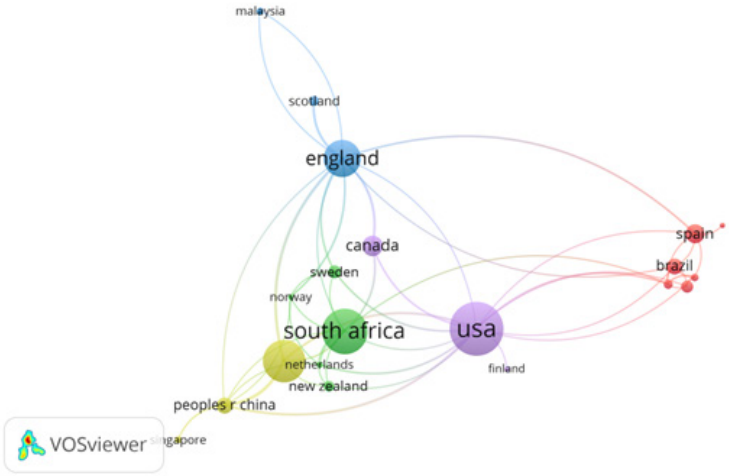


TABLE 4.

Languages	Record count	% of 866
English	752	86.84%
Spanish	76	8.78%
Portuguese	27	3.12%
Afrikaans	3	0.35%
French	3	0.35%
Russian	3	0.35%
Italian	1	0.12%
Turkish	1	0.12%
Total	**866**	**100.00%**

Journals analysis

Three hundred twenty-eight journals were publishing academic literacy studies from 1989. Table 5 summarizes the top ten most productive

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publications that print instructional literacy materials. *Teaching in Higher Education* (34; 3.93%) and *Journal of English for Academic Purpose* (28; 3.23%) are the most active journal in terms of overall publication volume, led by *Journal of Academic Language and Learning* (26; 3.00%) and *Studies in Higher Education* (25; 2.89%). In terms of the journal impact factor, the *Journal of Second Language Writing* (3.077) is the most influential journal of scholarly literacy research, preceded by *Studies in Higher Education* (3.0). Academic literacy publications are also multidisciplinary, such as Education & Educational Research, Linguistics, and Literature.

TABLE 5. Top 10 journals on Academy Literacy papers

Rank	Journal	Record count	(%) of 866	JIF (2019)	Research domain
1	Teaching in Higher Education	34	3.93%	2.136 (Q2)	Education & Educational Research
2	Journal of English for Academic Purposes	28	3.23%	1.893 (Q2 & Q1)	Education & Educational Research; Linguistics
3	Journal of Academic Language and Learning	26	3.00%	-	Education & Educational Research
4	Studies in Higher Education	25	2.89%	3.0 (Q1)	Education & Educational Research
5	Journal of Second Language Writing	24	2.77%	3.077 (Q1)	Linguistics
6	Higher Education Research & Development	22	2.54%	2.129 (Q2)	Education & Educational Research
7	Southern African Linguistics and Applied Language Studies	21	2.43%	0.327 (Q4)	Linguistics
8	English for Specific Purposes	20	2.31%	2.612 (Q1)	Linguistics
9	Journal of Adolescent Adult Literacy	19	2.19%	1.128 (Q3)	Education & Educational Research
10	Journal of University Teaching and Learning Practice	14	1.62%	-	Education & Educational Research

It is also mentioned that in the top 10 journals were two journals that did not show their impact factor by the Journal Citation Reports;

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Journal of Academic Language and Learning with 84 publications in WoS database, also had no journal impact factor in Scimago Journal & Country Rank (SJR), and Journal of University Teaching and Learning Practice with 222 publications from Australia had an SJR impact factor of 0.32 (Q3). Moreover, considering the interrelation between data sources and the bibliographic coupling, in figure 4, it can be seen that the journal that has the highest relationship with other journals is *Teaching in Higher Education*, followed by *Journal of English for Academic Purposes*, all journals were divided into three clusters (Green, Blue, and Red).

FIGURE 4. VOSviewer network map of Bibliographic coupling/source based on documents weight

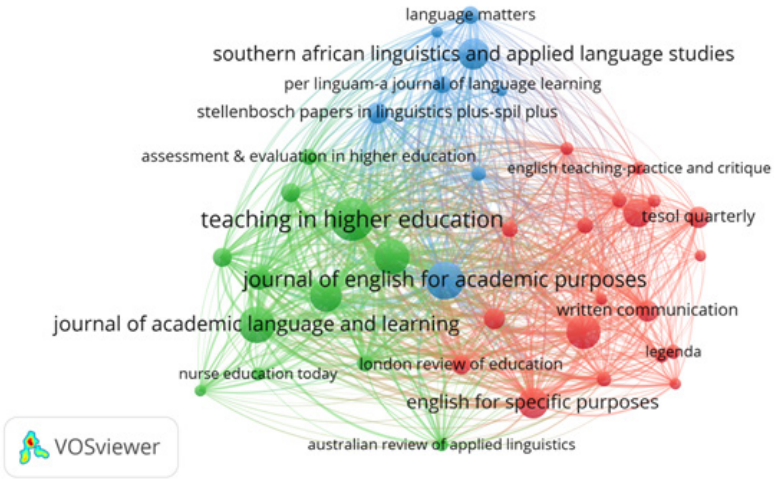

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TABLE 6. Academy Literacy papers on WoS by research area

Research area	Record count	% of 866
Education & Educational Research	557	64.32%
Linguistics	287	33.14%
Psychology	29	3.35%
Literature	23	2.66%
Information Science & Library Science	17	1.96%
Communication	15	1.73%
Social Sciences Other Topics	15	1.73%
Nursing	13	1.50%
Rehabilitation	12	1.39%
Arts Humanities Other Topics	10	1.16%
Government Law	7	0.81%
Engineering	6	0.69%
Anthropology	4	0.46%
Audiology Speech Language Pathology	4	0.46%
Business Economics	4	0.46%
Otros	24	2.77%

The areas studied in Academy literacy were mainly Education & Educational Research and Linguistics, covering 64.32% and 33.14%. Considering that many documents involved more than one research area, the percentage of a research area on WoS Categories was made based on the 866 papers to visualize its scope, as is shown in table 6**.** It is essential to mention than areas like nursing, engineering, business economics, and others increase their numbers of publications, indicating that diverse field of study is using academic literacy in their studies.

Authors and co-authorship analysis

Proceeding with the revision of the 866 documents, the average number of citations and the H-index determine the most influential authors in the academic literacy domain. Since 1989, 1,449 scholars have devoted their work to academic literacy research. Table 7 according to the number of documents they have published on academic literacy. This table also

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includes the numbers of publications on which the author was the first partner. If two or three authors were similar in rank, it compared the number of publications in which their names appeared first.

TABLE 7. Top 10 authors on Academy Literacy papers

Rank	Author	Record count on Academic Literacy	Other documents in WoS	Total	H-Index	Sum of times cited
1	Archer, A.	10	27	26	6	137
2	Lea, MR	6	8	14	9	593
3	Baker, S.	5	12	17	6	125
4	Clarence, S.	5	6	11	4	42
5	Garcia-Jimenez, E.	5	16	21	6	85
6	Guzmán-Simón, F.	5	11	16	3	44
7	Murray, N.	5	46	51	8	330
8	Van Dyk, T.	5	5	10	4	40
9	Weideman, A.	5	24	29	7	118
10	Wingate, U.	4	24	28	9	606

The top ten authors who have contributed the most documents on academic literacy are listed. Archer, A. from University of Cape Town (South Africa) and Lea, MR from Open University-UK (England), are the authors with the most significant number of 10 and six academic literacy publications each, followed by Baker, S. from the University of New South Wales Sydney (Australia), Clarence, S. from Rhodes University (South Africa), Garcia-Jimenez, E. and Guzmán-Simón, F. both from University of Sevilla (Spain). Regarding average citation and H-index, Lea (9) and Wingate (9) should be considered the academics who have made the most outstanding contribution to the scholarly literacy domain in terms of average citations and H-index. It is observed that Hiebert and Calfee, who were the initiators in the production of academic literacy papers, do not appear in the chart. In figure 5, it is seen that the author with the highest linked strength on Co-citation / Cited based on a weight of citation was Lea, MR, with a total production of 14 documents, followed by Hyland and Lillis.

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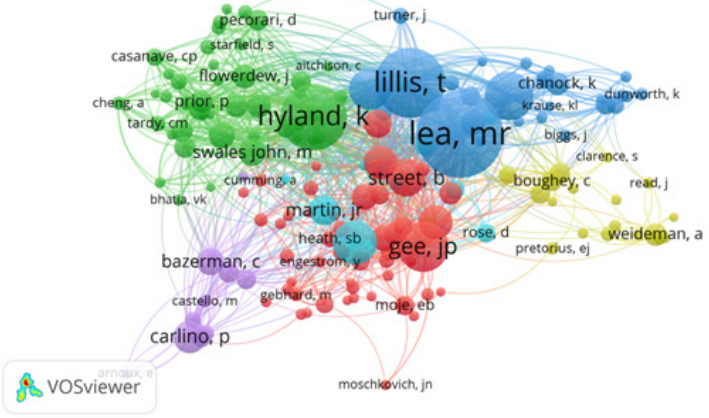
FIGURE 5. VOSviewer network map of Co-citation/cited author based on citation weight



In figure 6 it is observed the network map of Co-citation/cited references based on citation weight. All red distribution was divided in four clusters (Green, Yellow, Blue and Red) with a minimum number of 20 citations of a cited reference.

FIGURE 6. VOSviewer network map of Co-citation/cited references based on citation weight

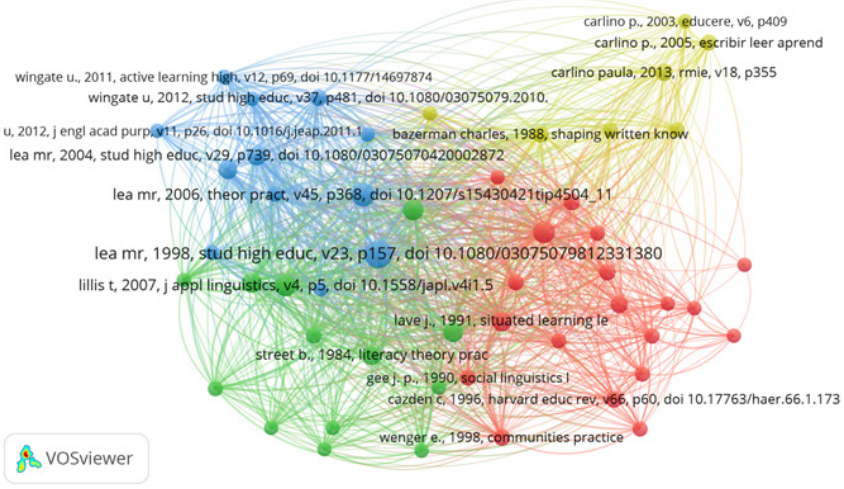


Table 8 gives the ten most cited publications in academic literacy research with relevant information: author, year of publication, name of the document, and total citations during 1989 to mid-2020. The most often cited article, with 742 citations, is titled *Student writing in higher education: an academic literacies approach*, published in the journal *Studies in Higher Education* in 1998 by Lea and Street. Gutierrez's (2008) paper *Developing a Sociocritical Literacy in Third Space* is ranked second (560 times) published in the journal *Reading Research Quarterly*. *The Academic Literacies Model: Theory and Applications*, written by Lea and Street (2006) and published in the journal *Theory into Practice*, is ranked third in citations (292 times). The top ten most quoted articles have been cited at least 111 times in data banks.

TABLE 8. Top 10 cited papers on Academy Literacy until September 13th, 2020 in WoS

First author	Year	Paper title	Cited times
Lea, M.	1998	Student writing in higher education: an academic literacies approach	742
Gutierrez, K.	2008	Developing a sociocritical literacy in Third Space	560
Lea, M.	2006	The "academic literacies" model: Theory and applications	292
Lillis, T.	2006	Professional academic writing by multilingual scholars – Interactions with literacy brokers in the production of English-medium texts	202
Spack, R.	1997	The acquisition of academic literacy in a second language - A longitudinal case study	167
Haggis, T.	2003	Constructing images of ourselves? A critical investigation into 'approaches to learning' research in higher education	158
Canagarajah, AS.	1996	"Nondiscursive" requirements in academic publishing, material resources of periphery scholars, and the politics of knowledge production	152
Lea, M.	2004	Academic literacies: a pedagogy for course design	121
Yoon, H.	2004	ESL student attitudes toward corpus use in L2 writing	119
Janzen, J.	2005	Teaching English Language Learners in the Content Areas	111

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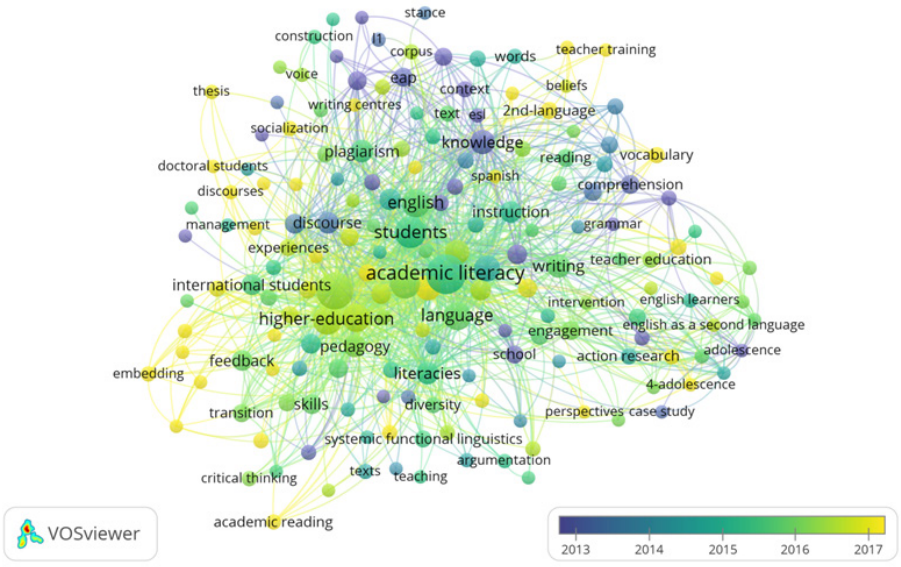
Keyword analysis

The keywords encapsulate the publications' primary material. The keyword analysis aims to identify important research topics and their relationships in academic literacy studies. All keywords (Author keywords and KeyWords PLUS) co-occurrences network in academic literacy are used to denote research topics in academic literacy about different disciplines. The most commonly occurring keywords are denoted by wider circles (Vošner et al., 2016). The lines connecting the keywords indicate the extent of their similarity (Danvila-del-Valle et al., 2019). From the 2,489 total keywords, figure 7 shows 175 keyword-related terms that appear at least five times. This overlay visualization shows that the highest correlations between topics were produced between 2015 and 2017, where there has been a higher production on academic literacy documents.

FIGURE 7. Keywords co-occurrence analysis of academic literacy publications.



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Findings

Bibliometric research was used in this study to determine the most pertinent documents, journals, authors, and keywords related to academic literacy. This analysis is a tool used in many studies to analyze the contributions of researchers in various fields of study and the trends and associations that could emerge from the findings of these studies (Garg & Sharma, 2017). This study would aid in gaining a greater understanding of how academic literacy studies are conducted, as well as the fields and disciplines in which they are conducted, which journals are the ones that are making the largest literacy productions as well as the importance of their impact factors and especially as has been the increase in the last decade, which indicates that it is a relevant issue and of interest on the part of the institutions to raise the academic level of their stakeholders and be aligned in a competitive world within the academy context. This method enables the analysis of publications and other materials using several keywords to determine the association between various sub-keywords related to academic literacy.

In the last quinquennium, the production of documents in academic literacy has increased. However, its application in different areas than Education & Educational Research is still very scarce. It can also be noted that a more significant number of publications would not mean high citation or a better index as an impacting factor. It is observed that Lea, M. has a total of 14 publications and only six of these documents in academic literacy, which have been cited more than 1,100 times in the field in comparison with other authors within the top 10 rankings on academic literacy with more publications but who do not get significant citations. High production of documents does not imply having a high H-index, so a higher citation is more relevant than higher production. The significance of these studies may not be appropriate for some specific contexts because each reality is different. Finally, there is a clear trend in qualitative research by the scientific community. Many of the documents are in journals with a high impact factor belonging to a specific quartile in the journal citation report.

The main limitation is that the study covers the web of science database, for which it is suggested to expand the research using other databases such as Scopus, JStor, EBSCO Discovery Service, ProQuest, Emerald, SAGE, or others; however, the study is according to the aim of

the investigation providing relevant bibliometric data about the literary about academic literacy. A new framework could be carried out to enrich the theory and the evolution of academic literacy.

Conclusion

Bibliometric studies are a handy tool for tracking academic success and intellectual development in a particular area. This study aimed to perform a bibliometric review of educational literacy documents' evolution using 866 papers from the Web of Science Core Collection database. The relevant information presented to determine the academic literacy study domain's research characteristics includes various types of documents, countries/territories, authorship, citations, sources, journal impact factor, and keywords.

It's identified numerous critical research metrics based on the bibliometric review of 866 documents, including the type of document and language of publications, the most influential writers in this subject, the most impactful papers, journal, and their respective journal impact factor, country, and keywords that have made the most significant contribution to this topic, as well as possible research hotspots. Overall, the number of academic literacy publications increased from its first publication in 1989 to 866 documents till mid-Set, 2020, referring to 1,449 authors, 328 journals, and 63 countries. The United States, South Africa, Australia, England, and Canada are the five more important countries in terms of college literacy paper productivity, with English being the most frequently used language (752 documents; 86.84%). Consequently, these countries have a lot of collaboration with others. Three hundred twenty-eight journals publish documents related to academic literacy. The five most active journals in this domain are Teaching in Higher Education, *Journal of English for Academic Purposes*, *Journal of Academic Language and Learning*, *Studies in Higher Education* and *Journal of Second Language Writing*, with a high impact factor that the Journal Citation Report has taken, Lea and Wingate have nine h-impact each, and Archer (10) and Lea (6) made the most significant contributions to academic literacy publications. Based on the co-occurrence's keywords, the research hotspot emphasizes Students, Higher Education, English, Knowledge and

Language. Education & Educational Research and Linguistics are the two significant areas studied by investigators, and others area are increasing.

It can be deduced that interest in academic literacy has moved away from earlier ideas and models such as Street's ideological paradigm and toward new implementations. Additionally, the primary analytical instrument for student literacy in higher education are reading and writing. As a result, researchers must do further studies on other forms of educational literacy across disciplines.

Academic literacy principally aims to understand the characteristic structures of reading comprehension and academic writing with an interpretation of each academic discipline' discursive culture or the particular way of expressing and communicating that members of the academic community have to make known in their field. Therefore, academic literacy research comes to encompass a multi-disciplinary domain that covers literature, linguistics, nursing, engineering, and other disciplines. Due to the increasing attention to research on academic literacy, articles with a high impact factor according to the JCR have been taken into account.

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