

KNOWLEDGE MAPPING IN VOCATIONAL ENGLISH RESEARCH: A SCIENTOMETRIC ANALYSIS

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ABSTRACT

Knowledge Mapping is a process of synthesizing the information of research and publication in any domain/subject. Vocational English has been the subject of English for Specific Purposes. In the recent past, it has been observed that the growth in the scholarly contributions in Vocational English. In this research study, a bibliometric analytical technique is used to examine Knowledge Mapping in Vocational English. The aim of this study is to evaluate the bibliographical data in order to review the recent scenario of scientific databases of Scopus as well as Web of Science core collections pertaining to VE literature. The screening methodology was conducted in March 2021. All publications retrieved using the key terms like "Vocational English Teaching" or "English for Specific Purposes" extracted 4,888 scientific contributions. Therefore, the time frame considered for this study is between 1978 and 2020. The result identified the significant areas related to VE focuses on English for Specific Purposes, Vocational English Learning, Vocational English Teaching, Technical English, Business English, Business Communication Skills, English at Work Places, English for Technical Purposes, English for Employment, Functional English. Future research could extend a similar study in other related areas in English language teaching-learning to explore the publication trends globally.

Keywords: Vocational English, English for Specific Purposes, Scientometric Analysis, Scopus, Web of Science

1. Introduction

There is a steady demand for English instructors in vocational settings (Simkova et al., 2021). The obvious explanation for this is that effective communication skills are extremely important for work. English as language for business purposes (EBP), English as language for academic purposes (EAP) (Khamis et al., 2019), and English as language for occupational purposes (EOP), among others, are considered research and teaching in the field of ESP (Liu & Hu, 2021a). It is necessary to comprehend the study work done in the field of vocational English education in order to comprehend the global trend of vocational English. As a result, this study will be valuable in gaining a better understanding of research viewpoints in this sector.

The current paper examines Vocational English (VE) research papers. The study's goal is to do a scientometric analysis of all of the papers on Scopus and Web of Knowledge that are linked to VE (Song & Sun, 2019). A complete analysis of the global research overview was conducted in this study, which will aid in the careful examination of various facets of the scientific

panorama inherent in VE (Arifin et al., 2020). The language of publishing (English) and the type of material of the preliminary criteria used i.e. article (Elliott & Zhang, 2019). The study looked at the increase in author productivity, the distribution of the thematic category, publication models, publication nation, the distribution of the author's keywords, and the most often referenced articles related to VE publications.

2. Literature Review

The co-citation analysis gave a diachronic, quantitative, and systematic summary of ESP research (Liu & Hu, 2021a). Bibliographic data from online databases is used in bibliometric procedures (Secinaro et al., 2020). By identifying the field's primary study areas, landmark works, and growing patterns across time, a scientometric review can add to the field's meta-disciplinary knowledge by providing a systematic account that supplements prior narrative reviews (Liu & Hu, 2021b).

In China's vocational College English instruction, it has been proved that a career-oriented teaching method is helpful (Liu & Hu,

2021a). The application of sophisticated technology in higher vocational English teaching by examining Stanford University's English computer multimedia teaching system, as well as recommendations for furthering In higher vocational colleges, English teaching is being reformed(Mahbub, 2019). The bibliometric analysis revealed the most popular themes (author keywords) as well as the most productive authors, sources, nations, and organisations (Janik et al., 2020).

The recent trends in higher vocational English language teaching practice is the construction of English language teaching reforms essentially supported by the mobile Moodle platform in order to improve the efficacy of English teaching(Huang & Wang, 2021). In the 'Internet + era,' the network information teaching technique of higher vocational English, with the goal of providing references and references for vocational English education(Zhong, 2020).

The association between learning behaviour and English effective learning significantly predicts that constructive learning can predict learning behaviour, whereas destructive behaviour adversely predicts learning behaviour, providing a reference for higher vocational English (J. Chen, 2020). It has been given considerable attention to language elements, such as English grammar, word pronunciation, and collaboration abilities, in many years of English teaching practise, but we have disregarded the vital role of learning behaviour in English effective learning (L. Chen et al., 2018). The scientometric review, which was done, provided a systematic account that supplemented the narrative reviews that were already accessible (Ruiz-Rosero et al., 2017)(J. Chen, 2020). This research is being continued in this work, which aims to give a historical scientometric analysis of VE research(Song & Sun, 2019).

3. Objectives of the Study

- To find out the global research trend in VE literature
- To obtain the most productive authors related to VE publications
- To determine the most productive sources of publication

- To examine the leading countries and their contributions related to VE literature
- To explore the scientific mapping of significant key terms, country collaboration

4. Methodology

Scientometrics is an ad hoc term for the study of the quantitative aspects and characteristics of scientific research, technology, science, and innovation. Bibliometrics is a branch of scientometrics that deals with the statistical study of books, papers, and other types of scientific production [10]. In the foreground, the screening process used in March 2021 for precise and comprehensive study., sought all references to “Vocational English Teaching” OR “English for Specific Purposes” OR “Vocational English Learning” OR “Technical English” OR “Business English” OR “Business Communication Skills” OR “English at Work Places” OR “English for Technical Purposes” OR “English for Employment” OR “Functional English” in all fields of Scopus (5538) and Web of Knowledge (2250) scientific contributions were found respectively. After duplication removed the core contributions reduced to 4,888. The criteria for inclusion were utilised in the selection of the findings. As a result, the findings include a publishing time span of 1990 to 2020. However, for the sake of study, we restrict our data set to the years 1978–2019.

4.1 Materials and Methods

The development of research and the knowledge structure in the disciplines of Vocational English was examined using scientometric analysis(Education, 1996)(Lukesch & Zwick, 2020). This examination covered scientific publications in the domain of Vocational English (VE)(Colley et al., 2007). A presentation of the main bibliometric data precedes the study of bibliometric results. Following that, the examination considers authors, indicators, data, and research countries(Arifin et al., 2020).

As a result, 4,888 documents were retrieved. The query is noteworthy to examine the global research field of VE is broadened. The * symbol was used to indicate 13 general phrases and their variants. The title of the retrieved document or the keywords associated with it

contained one of these terms (provided by authors or automatically indexed)(Suprpto et al., 2020).

4.2 Bibliographic Data Analysing Tools

To examine the results of Scopus and Web of Science searches, we used the following tools.

4.2.1 Bibliometrix - An R programme for Scientometrics and Bibliometrics that allows you to conduct extensive quantitative research. It allows bibliographic data to be imported from a variety of sources, including Scopus and WoS. Co-citation, as well as other types of measurements like coupling, scientific collaboration, and co-word analyses, are all evaluated (Mayer, 2014)(Alonso et al., 2018)(Ruiz-Rosero et al., 2019).

4.2.2 ScientoPy - ScientoPy 2.0.3, a Python script, creates and reports the top themes (based on authors' keywords), authors, and countries, as well as related publications, automatically (Ruiz-Rosero et al., 2017)(Ruiz-Rosero et al., 2019).

4.3 Dataset And Analysis

This scientometric analysis used in this study considered two scientific bibliographic research databases Web of Science (WoS) and Scopus(Janik et al., 2020). The document types were covered from 1978 to 2020. The type of publications retrieved with the search string "Vocational English Teaching" found in Web of Science (WoS) and Scopus used to extract bibliographic data on 10th March 2021. In March 2021, Scopus and Web of Knowledge's "Advanced Search" tool was used to execute the query. Key terms used for the data export are as follows.

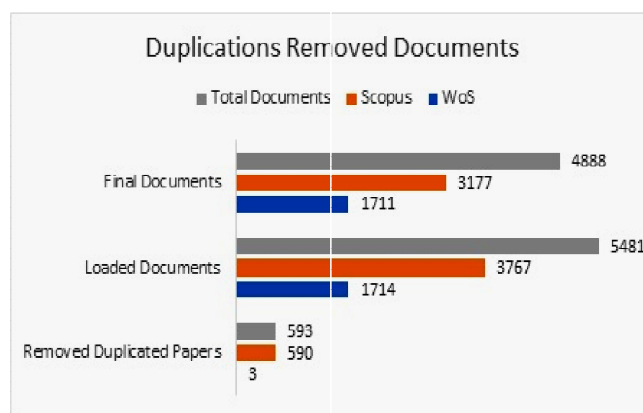
"English for specific purpos*" OR "Vocational English*" OR "Vocational English Teaching" OR "Business English" OR "Business Communication Skill*" OR "Technical English" OR Vocational English Learning" OR "English at workplace" OR "English for science and technology" OR "English for academic*" OR "English for technical purpose" OR "English for Employment" OR "Functional English*" AND (LIMIT-TO (LANGUAGE, "English"))

Bibliometrix, a R programme for doing extensive quantitative analysis in Bibliometrics and Scientometrics, supports the import of bibliographic data from a variety of sources, including Scopus and Web of Knowledge. Co-citation is analysed, as are other sorts of metrics such as coupling, scientific collaboration, and co-word analyses. The statistical analyses were carried out using R-studio and ScientoPy, two statistical software packages(Gumpenberger et al., 2012).

4.4 Limitations

To extract data from both sources and converting into a common format is a complex process for making multiple files into a single common file used as a dataset for analysis(Flores-Buils et al., 2012). This study focused only on the English language not included publications from other languages related to VE literature(Omar et al., 2020).

The total loaded documents of "Vocational English Teaching" for analysis were presented as in Figure 1, revealing an increasing growth in the literature on VE from both databases includes Scopus (5481) and WoS (3767) were observed, the retrieved publications have some duplicates, it is cleaned for further analysis. The below figure shows the number of publications loaded for removing duplications from the two databases, the number of duplicate documents removed, and the final documents (4888) considered for further analysis. Totally 593 documents were identified as duplicate documents.



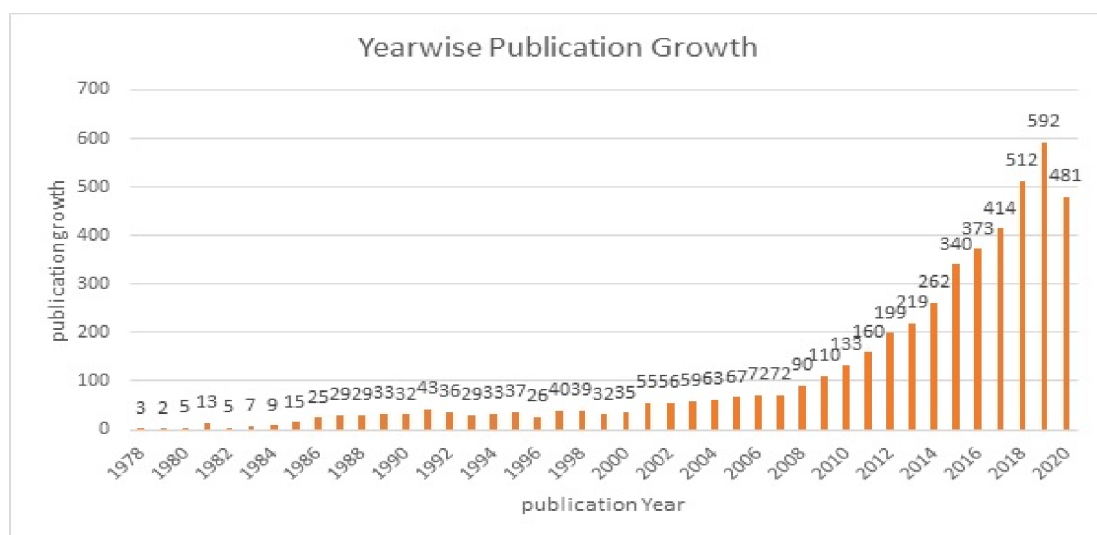
1. Figure: Records after Duplications Removed

Description	Result
Timespan coverage	1978-2020
Sources (Journals, Books, etc)	856
Documents	4888
Average citations per documents	11.96
DOCUMENT TYPES	
Article	4632
Review	256
DOCUMENT CONTENTS	
Keywords Plus (ID)	1228
Author's Keywords (DE)	8944
AUTHORS	
Authors	6934
Author Appearances	11575
Authors of single-authored documents	1395
Authors of multi-authored documents	5539
AUTHORS COLLABORATION	
Single-authored documents	1640
Documents per Author	0.705
Authors per Document	1.42
Co-Authors per Documents	2.37
Collaboration Index	1.71

1. Table:Summary of VE Publications from Scopus and WoS

Table 1 represents the profile of Vocational English Teaching research trends were seen through the Biblioshiny window from the time span 1978 to 2020. The highest contributed document in VE research in Journal articles.

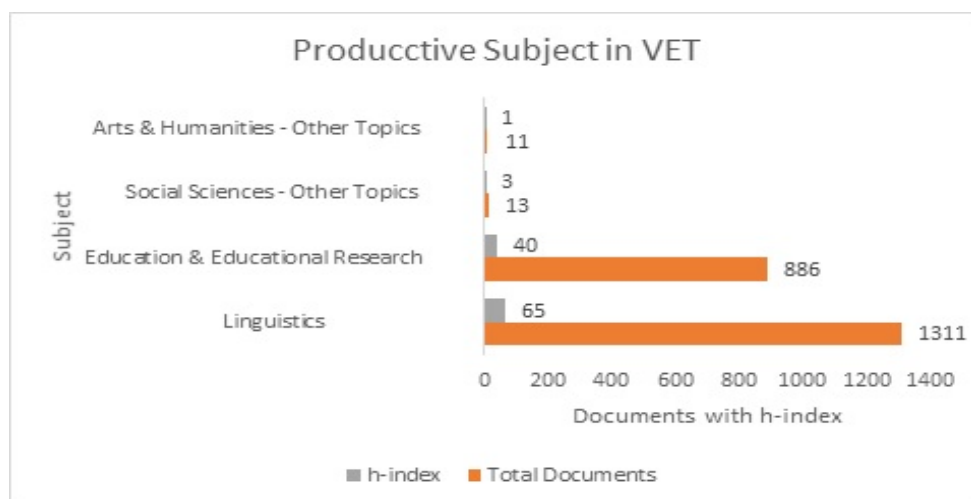
The journal articles accounted for 4632 followed by 256 reviews. Multi-authored documents contribution is highest with 5539 followed by single-authored documents 1395.



2. Figure: Year wise Publication Growth

Figure 2 depicts the number of VE articles with time, beginning with three publications in 1978 and ending with 481 papers already available online in 2020. It can be seen that the number

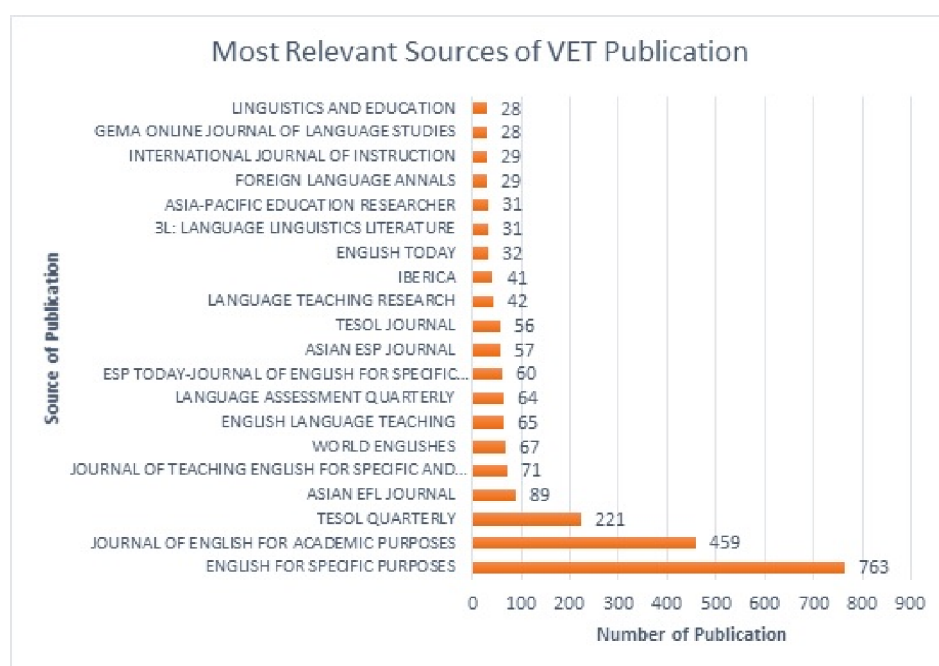
of publications has increased steadily from 2008 to 2020. Furthermore, in 2019, there was a considerable increase in publications, with 592 being the greatest.



3. Figure: Productive Subject from VE Publication

Figure 3 represents the subject-wise publication coverage of VE with h-index. The figure shows that the subject Linguistics covers the highest number of publications with a higher h-index (1311 publications with 65 h-index) followed by the subject Education & Educational Research (886 publications with 40 h-index), Social Sciences (13 publications with 3 h-index), the subject Arts & Humanities

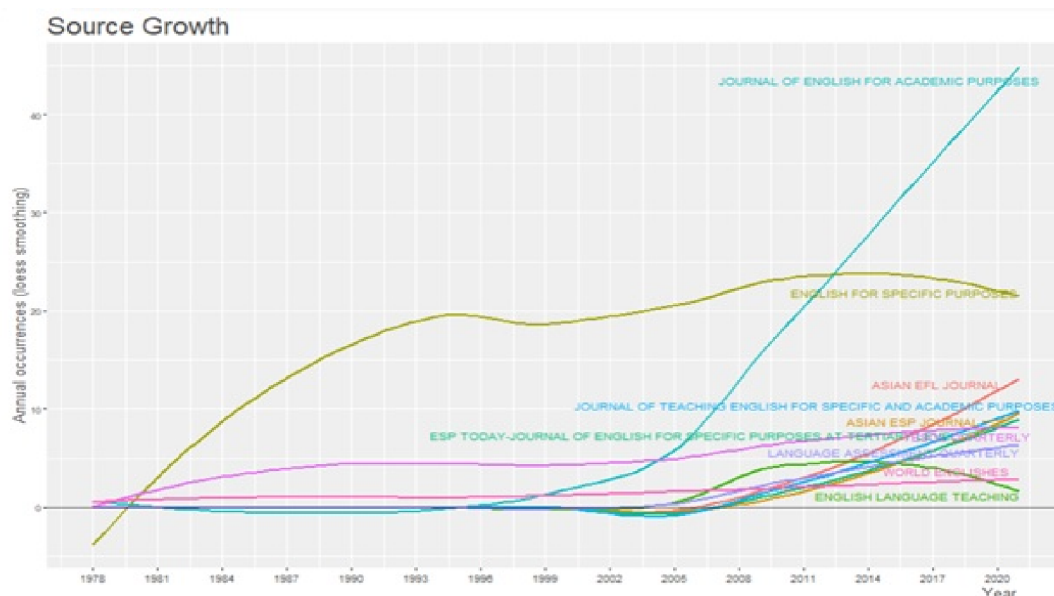
with the least publications with least h-index (11 publications with 1 h-index). The figure shows the analyses that Linguistics followed by Education and Educational Research are the leading subject and cited widely scored high h-index which meant the contributions in VE research and publication is significantly increasing (Gumpenberger et al., 2012).



4. Figure: Productive Journals which Published more articles on VE

Multiple journals are used to gain a better knowledge of the subject under investigation's importance and scientific depth [2]. Figure 4 shows the top twenty relevant sources in which publications on VE were taken along with the total amount of publications published over

time. The figure shows the journal titled English for Specific Purposes has the highest publication (763) on VE followed by Journal of English for Academic Purposes (459), TESOL Quarterly (221), and Asian EFL Journal (89), and so on (Liu & Hu, 2021b).

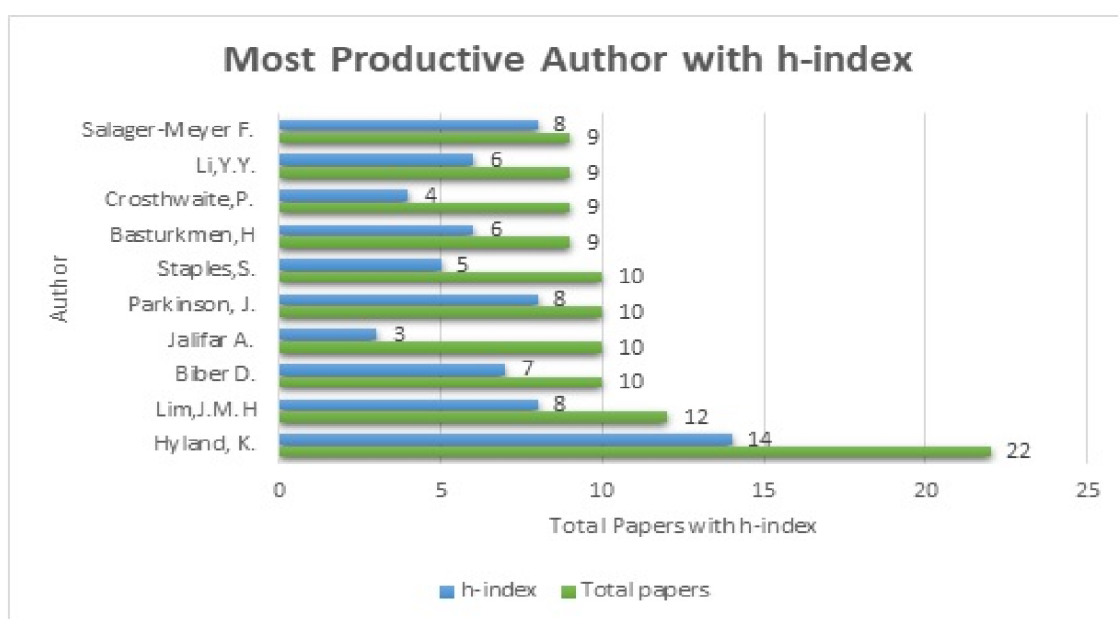


5. Figure: Evolution of VE related Journals

The above figure 5 represents the distribution of articles published over a period of time, presented the journals associating with the topic VE and its associated themes. Total amount of publications published over time Between 2005 and 2020, there was a considerable increase in the number of publications on VE. The major VE-related contributed journals are like Journal of English for Academic Purposes, followed by English for Specific Purposes, Asian EFL Journal, Journal of Teaching English for Specific and

Academic Purposes, Asian ESP Journal and figure listed remaining journals are published least score compared to the above-mentioned journals.

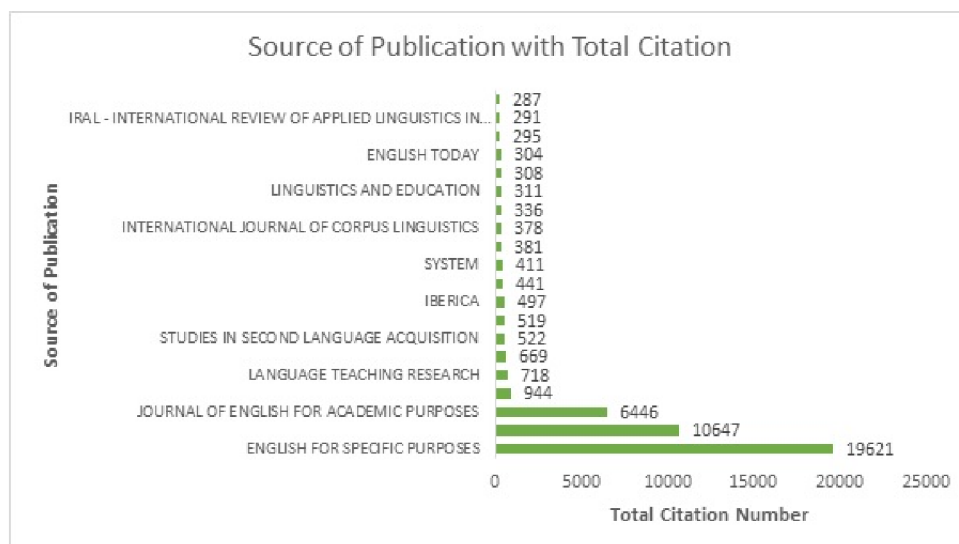
Figure 5 indicates that journal dealing with the VE research is predominantly published in English for Specific Purposes from 1978 to 2020 and the evolution of the publications significantly influenced from the period of 2002 to 2020 by all other journals mentioned in figure 5.



6. Figure: Top Contributing Authors with h-index on VE

Figure 6 identifies the most productive authors with h-index. This sector shows the authors who are most productive for Vocational English Teaching. It also lists the first ten authors who have published a considerable number of articles. From figure 6, it can be

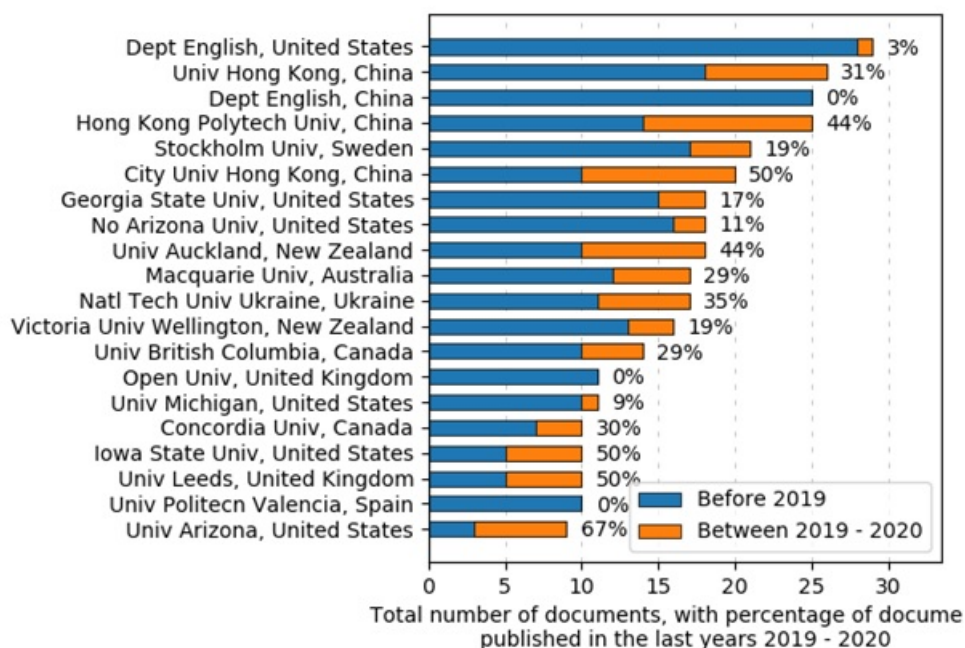
seen that the author the h-index that is the highest belongs to Hyland, K (22 papers with 14 h-index) followed by Lim, J.M.H, Parkinson, J and Salager-Meyer F having (12, 10, 9 papers respectively with 8 h-index).



7. Figure: Productive Publication Sources with Total Citation Numbers

Figure 7 shows the top ten sources in which publications on VE were taken along with the total number of citations. The figure further shows that the publications of English for Specific Purposes with the highest total

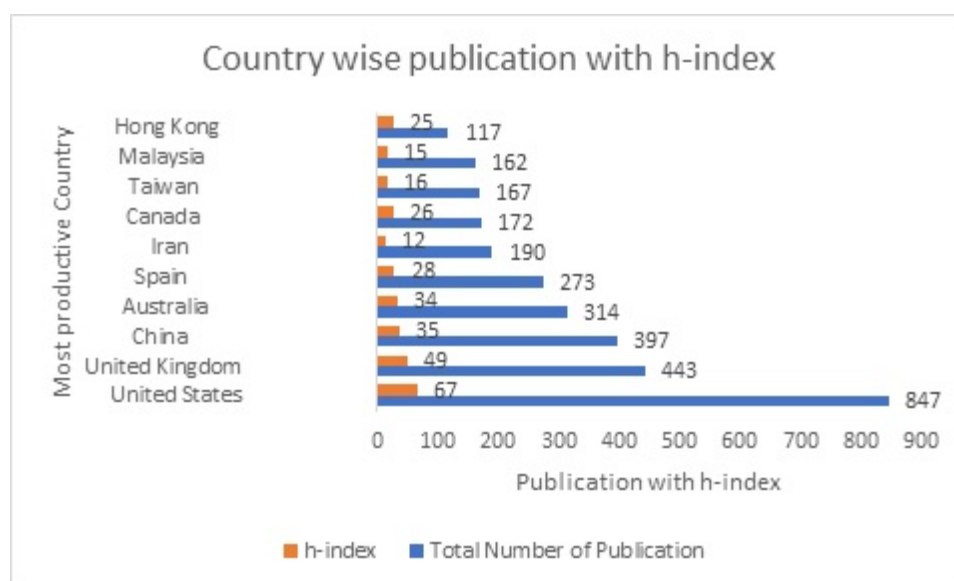
number of citations (19621) followed by TESOL Quarterly (10647), Journal of English for Academic Purposes (6446), World Englishes (944), Language Teaching Research (718), etc.



8. Figure: Top Productive Institution Affiliations along with the Country

From the data analysis, as per the institution affiliation along with country, it is identified that the Department of English (the United States) leads the topper position followed by University Hong Kong, Department of English

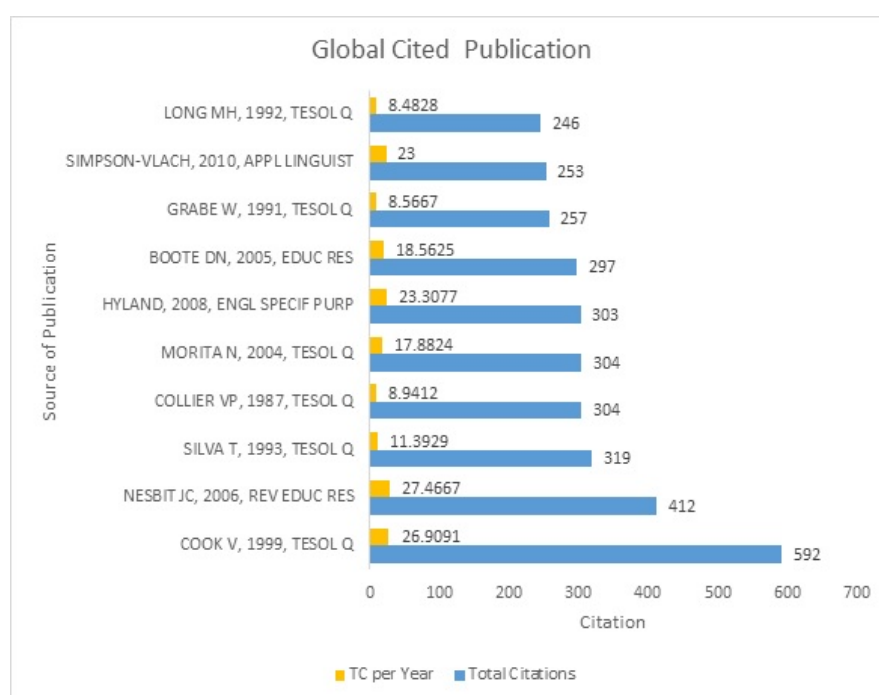
Hong Kong Polytechnique University, City University Hong Kong (China), Stockholm University (Sweden), etc. for more details, readers can refer to figure 8.



9. Figure: Country Contributions on VE with h-index

Most productive countries with related publications were generated. Figure 9 shows the sequence of countries with higher productivity of VE publications globally. The table illustrates that the top five contributors are The United States (847 Publications, 67 h-

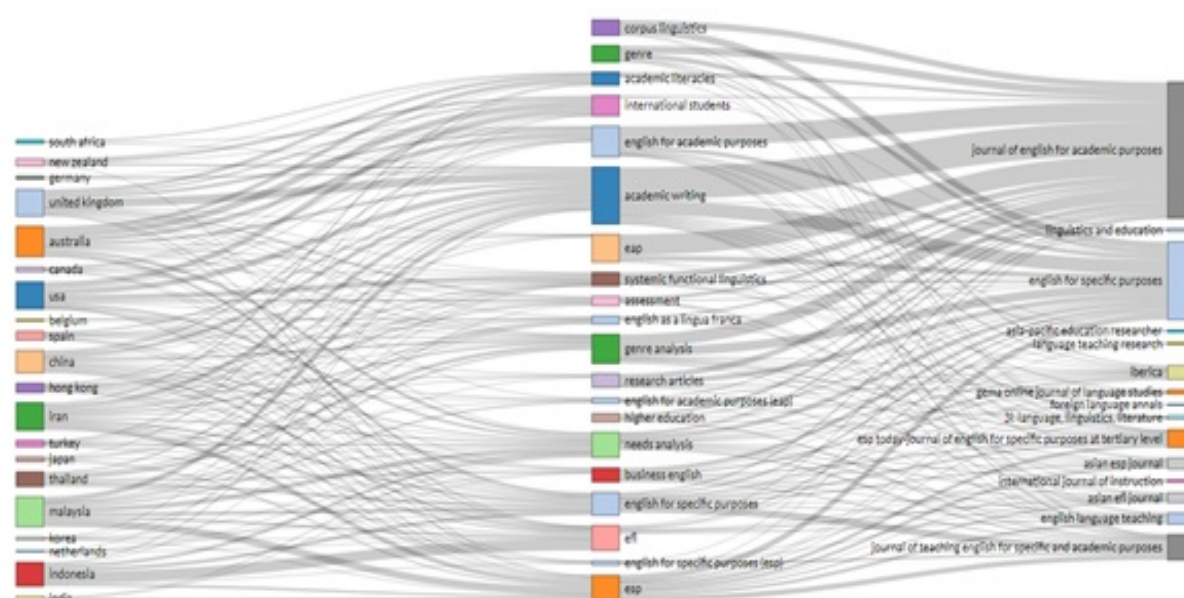
index), The United Kingdom (443 Publications, 49 h-index), China (397 Publications, 35 h-index), Australia (314 Publications, 34 h-index), and Spain (273 Publications, 28 h-index).



10. Figure: Most Global Cited Publications on VE

Figure 10 depicts the ten most cited works, with total citations ranging from 592 to 246. The author's name is indicated in the figure along with the year of publication with the name of the journal with total citation along with total citation per year. The highest number of references has been obtained by an article published in 1999 in TESOL by COOK V

(592), and it has been identified as the most cited article to-date. Five articles one from Review Educational Research by NESBIT JC (412) in 2006, the other three from TESOL namely SILVA T (319) in 1993, COLLIER VP and MORITA N (304) respectively in 1987 and 2004, and HYLAND (303) from English for Specific Purposes in (2008).



11. Figure: Relationship among Country(left), Keywords(middle), and Sources (right) in VE publication

The necessary elements were represented in the picture by rectangles of various colours for easy reference in this visual presentation. The figure of other elements is shown by the height of the rectangles, which symbolises (one of the elements in the country, keyword, and sources). The higher the rectangle depicting the element, the more relations it had.

Figure 11 infers the relationship among the Country, Keywords, and Sources using the Three Fields Plot. The analysis of the top countries, keywords, and sources indicated that there were three sources (i.e., Journal of English for Academic Purposes, English for Specific Purposes, and Journal of Teaching English for Specific and Academic Purposes) and five keywords (i.e., Academic Writing, English for Specific Purposes, Genre Analysis, Need Analysis and English for Academic

Purposes) having strong relations with seven the countries (i.e., United Kingdom, Australia, The United States of America, China, Iran, Malaysia, and Indonesia).

Figure 11, infers the relationship between the dominant country in VE research, frequent keywords in VE literature, and most productive journal publications related to this domain. It shows that Australia, United Kingdom, the USA, Malaysia, Indonesia, China, and Iran are dominating countries. Academic writing, English for academic purposes, English for specific purposes, ESP, EFL, EAP, and international students are the familiar frequent keywords. Journal of English for Academic Purposes, English for Specific Purposes, and Journal of teaching English for specific and academic purposes are popular journals related to this domain (Rajendran et al., 2011).

Country Collaboration Map

**12. Figure: Country Collaboration Mapping in VE Publications**

Figure 12 illustrates the pictorial evidence of the country's collaboration. Based on the analysis of the keywords, countries like The United States of America, United Kingdom, China, Australia, New Zealand, Canada, Germany, and Japan were identified as the main collaborative country's networks in the world and consequently were at the forefront of very high production. Table 2 shows the

relationship between the different countries and ranked based on its collaboration in research and publications. Figure 12 differentiates the countries with darker and lighter colors, represents those countries with brighter colour are significantly involved in VE research, and missed out areas are still not engaged in the field of research (Martynov et al., 2020).

Rank	From	To	Frequency
1	USA	China	22
2	USA	Korea	13
3	China	Hong Kong	10
4	China	United Kingdom	9
5	USA	Canada	9
6	USA	United Kingdom	8
7	China	Australia & New Zealand	7
8	United Kingdom	Hong Kong	7
9	USA	Japan	6
10	Australia	Iran	5
11	United Kingdom	Australia	5
12	USA	Australia	5
13	Canada	United Kingdom	4
14	Malaysia	Iran	4
15	United Kingdom	Iran & Japan	4
16	USA	Italy	4
17	Australia	Hong Kong	3
18	Belgium	Germany	3
19	United Kingdom	Germany, Netherlands & Spain	3
20	USA	Germany, Netherlands, New Zealand & Turkey	3

2. Table: Top Twenty Country Collaboration in VE Publications

Figure 12 and Table 2 identified that the USA with China, Korea, Canada, United Kingdom, Japan, Australia Italy, German, the

Netherlands, News Land, and Turkey have collaborated well in terms of VE research and publication, likewise, China with Hong Kong,

USA, United Kingdom, Australia, and New Zealand are a strong collaboration. Similarly listed countries work together in terms of VE publication and research.

The inference of this Table 2 and Figure 12 determine that developed and developing countries work together in terms of VE collaboration, and also native English-speaking countries have a significantly strong collaboration with non-native English-speaking countries it shows the importance of VE research globally (Yang, 2020).

5. Discussion

In this Scientometric study, the authors analysed the overall VE research output during the last 42 years with the total number of publications reaching 4888 (3,177 Scopus Documents and 1,711 Web of Science Documents) in 2020 from 856 sources including 4632 articles and 256 reviews with overall 6,934 authors from 91 Countries. The overall publication output was very low prior to 1985 (n=15) and began to increase extensively after 2009 (n=110), reaching a peak in 2019 (n=592). In the entire dataset of 6,934 authors, single-authored documents were 1,395 and multi-authored documents were 5,539. Among the identified subjects, Linguistics covers the highest number of publications with a higher h-index (1311 publications with 65 h-index). Among the top journal sources of VE publication, the top three sources were English for Specific Purposes has the highest number of publications (763 documents) followed by Journal of English for Academic Purposes (459 documents), TESOL Quarterly (221 documents). It was identified that Significant growth in the number of publications on VE was between the period 2005 and 2020. In the global VE research, the top five authors who contributed a significant number of publications with a higher h-index were identified as Hyland, K (22 papers with 14 h-index) followed by Lim, J.M.H, Parkinson, J and Salager-Meyer F having (12, 10, 9 papers respectively with 8 h-index) and Biber D (10 papers with 7 h-index).

The top five publication sources with the highest number of citations in VE research identified as English for Specific Purposes with (19,621 citations) followed by TESOL

Quarterly (10,647 citations), Journal of English for Academic Purposes (6,446 citations), World Englishes (944 citations) and Language Teaching Research (718 citations). In VE publication the top five contributors with institutional affiliation along with its country were identified as Department of English (United States- 29 publications with 16 h-index) leads the top position followed by University Hong Kong, Department of English Hong Kong Polytechnique University, City University Hong Kong (China- 26 publications with 9 h-index, 25 publications with 15 h-index, 25 publications with 9 h-index), Stockholm University (Sweden-21 publications with 10 h-index). The top five countries which contributed in VE publication were identified as The United States (847 Publications, 67 h-index), The United Kingdom (443 Publications, 49 h-index), China (397 Publications, 35 h-index), Australia (314 Publications, 34 h-index) and Spain (273 Publications, 28 h-index).

The Three Fields Plot analysed the relationship among the Country, Keywords, and Sources. The analysis of the top countries, keywords, and sources indicated that there were three sources (i.e., Journal of English for Academic Purposes, English for Specific Purposes, and Journal of Teaching English for Specific and Academic Purposes) and five keywords (i.e., Academic Writing, English for Specific Purposes, Genre Analysis, Need Analysis and English for Academic Purposes) having strong relations with seven the countries (i.e., United Kingdom, Australia, The United States of America, China, Iran, Malaysia, and Indonesia). Country collaboration was done by analysing the keywords. The result showed that The United States of America, the United Kingdom, China, Australia, New Zealand, Canada, Germany, and Japan were identified as the main collaborative country's networks in the world and consequently the forefront of very high production.

6. Conclusion

The research article shows that the global literature on Vocational English Teaching focuses on English for Specific Purposes, Technical English, English at Work Places, English for Employment, and Functional

English (Arik & Arik, 2021). This scientometric study provides an in-depth analysis of global VE research, highlighting the interdisciplinary themes of VE. Over the past four decades, VE research had progressed enormously, resulting in a better understanding of the Vocational English Teaching-learning process (Manouchehri et al., 2021). Author and

country-wise collaborative research of VE have led to substantial progress over the years. A research study like this is highly useful for researchers, teachers and other stakeholders of VE in order to understand the strengths and potential gaps in the VE research and to plan accordingly.

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