

Exploring Research Trends in Sustainability in English Language Education from 2014 to 2024: A Bibliometric Analysis

Senem ZAIMOĞLU¹ , Çağ University, Faculty of Arts and Sciences
senemdag@cag.edu.tr

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Abstract: Sustainability in language education is a multifaceted concept that encompasses environmental, linguistic, and educational dimensions. As the world deals with environmental challenges and the rapid loss of linguistic diversity, it becomes necessary to integrate sustainable practices into language teaching. Therefore, research on this field have become more widespread. Based on this, the purpose of this study is to review and identify the importance of sustainable practices in English language teaching by conducting a bibliometric analysis of the literature related to Sustainability. This research makes a valuable contribution to the existing body of literature by examining the current state, identifying areas that need improvement, and suggesting possibilities for future research. The search involved combining topic-related keywords for 'sustainable' and 'English language teaching' within the time period from 2014 to 2024 in the Web of Science database (SSCI, SCI, SCI-E, and AHCI). The data was collected using a data extraction table from 1,523 articles that were analyzed using the VOS viewer data visualization tool. The findings suggest that sustainable approaches in the field of language teaching have experienced significant growth in literature in recent years. However, it can be stated that research is still limited in English language education. While there is a growing body of study addressing the theoretical aspects of sustainability, there remains a significant gap in empirical studies that explore the effectiveness of sustainable practices in real-world educational settings. Additionally, the geographical distribution of research indicates a concentration in certain countries, suggesting a need for more diverse and inclusive studies that consider different cultural and linguistic contexts. This bibliometric analysis underscores the necessity for future research to focus on developing actionable strategies, assessing their impact, and fostering international collaboration to promote sustainability in language education globally.

Keywords: *Sustainability, sustainable practices, English language education, bibliometric analysis, VOSviewer*

INTRODUCTION

The concept of sustainability, traditionally associated with environmental, has now become more prevalent in different fields, including education. The broader application of this concept demonstrates an increasing awareness of the importance of integrating educational practices with sustainable development goals (SDGs) and equipping students with the necessary skills to tackle the challenges of the 21st century (United Nations, 2015). This is because these challenges such as climate change, rapid technological development, and global inequality, require a more holistic education than one focusing on traditional curricula. As the World Economic Forum (2020) points out, addressing and negotiating these complex challenges necessitates not only knowledge but also competencies in critical thinking, problem-solving, and adaptability, which are a necessity for future-oriented education. This is where the integration of SDGs in education comes in. The SDGs provide an overarching structure to contextualize learning with real-world problems and in doing so build capacities that are critical for meaningful engagement in a future that is global and rapidly changing (UNESCO, 2017). Therefore, understanding and aligning SDGs in educational practices is an essential

¹ ORCID: [0000-0002-6991-4455](https://orcid.org/0000-0002-6991-4455)

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part for equipping students with the capabilities to comprehend and address the contemporary challenges and help build a more just and sustainable society.

In the context of English Language Education, pedagogical practices need to be revised in order to address the principles of sustainability, which pertain to the environment, social and economic dimensions. That means that putting sustainability into ELT needs a review of the methods of teaching English, where not only environmental matters have to be included but also social and economic dimensions as part of the sustainability approach (Cutter-Mackenzie & Smith, 2003). A sustainability-informed approach to ELT recognizes the core purpose of education, which is to make the world a better place. For one, language education driven by sustainability provides realistic contents and a practical way to do something about the inevitable problems of the global world today (Huckle & Sterling, 1996).

In this way, students do not just learn about environmental and social issues, but also the language to act upon them. More importantly, this transformation in teaching practice is important because education is not merely about grammatical language competence but also about using language to act and engage with the world as responsible global citizens. In addition, UNESCO (2017) asserts that the competencies required to achieve sustainable development, and those linked to critical thinking and problem solving are closely related. When sustainable development is integrated into languages, students are more likely to develop those competencies. This also contributes to making tasks more engaging through authentic contexts involving global issues, such as climate change (Saavedra & Opfer, 2012). Hence, with sustainability integrated into language curricula, there is more likelihood that the communicative approach would work better. For example, when speaking practices are applied in the context of sustainability, learning becomes more authentic and meaningful, and students are likely to be more inspired to be more proactive in responding to global challenges. Therefore, integrating sustainability into ELT is not only an improvement, but also a complete motivation for students to learn language, which will enable them to use language to create a new future.

In fact, the relationship between SDGs and ELT can be discussed from different aspects. On the one hand, integrating elements of sustainability into English language learning allows learners to gain deeper knowledge of sustainability concepts and motivates them to become global citizens and care more. They can discuss sustainability issues which require critical thinking that encompasses an increasing number of factors associated with language, society and environment in an interconnected world. On the other hand, a good quality language education can provide knowledge and understanding of local and global sustainability issues and to develop abilities to address these issues. A good command of language can help learners articulate complex environmental and social issues more comprehensibly and convincingly, and they can have a greater opportunity to support and make meaningful contributions to sustainable practices in their local communities (Jickling & Wals, 2008). Chen et al. (2023) argue that a language program integrated with sustainability not only engages the learners in noticing and understanding, but also equips the learners to act. By learning about the language more relevant to the ideas of the 17 SDGs, English language learners will be better prepared to actively engage in a fairer and more sustainable society. To make it more explicit, ELT plays a major role to advance these goals by enabling students to master the kind of language skills which allow them to communicate and effectively reflect on problems. As Goal 4, Quality Education, states, an inclusive and equitable education is needed to have life-long learning opportunities. This can be seen to overlap with an aim of ELT to develop not only language proficiency, but also critical thinking skills such as problem-solving. Introducing sustainability topics into language education will enable students to think, analyse, and discuss global issues, and offers them a real educational challenge to prepare them for their lives (UNESCO, 2017). Practically speaking, by being taught how global issues are portrayed in the media and many other kinds of texts used in ELT classes, students will learn to interpret the world themselves and to further express their views orally or in written form. For example, while reading and discussing news about global education development, students can better understand and express their ideas about quality education or life-long learning. There are also formal aspects of language classes that can be connected to other SDGs such as Goal 5, Gender Equality.



Generating gender-sensitive language use and possibilities for dialogue within language classes can reflect this aim. Students can be asked to analyze texts according to the perspective on gender and gender-related news, or they prepare these topics in a specific project. Because students are situated in the middle of the female and male stereotype, it is a perfect topic to make out and stand for equality. They can then engage with creating dialogues or create a debate or write an essay on gender topics. However, every work they prepare should meet linguistic requirements and refer to equality (UN Women, 2020). To provide students' knowledge and understanding of global disparities, include materials that address many diverse cultural and socio-economic backgrounds. This includes the use of reading articles or literature written from other cultural perspectives that can influence their ideas and perceptions from the subject matter, encouraging social justice literacy, empathy, and understanding of various perspectives (Crosthwaite, 2015). On the other hand, Goal 13 (Climate Action) can be provided study by engaging students with understanding global climate action. Students can debate and advocate for new climate routines or even writing a persuasive essay on following regulations of climate justice. By doing such speaking activities, students can apply what they have learned to practice, speak about critical issues, and facilitate language to solve pressing local environment issues (Huckle & Sterling, 1996). Integrating Goal 2 (Zero Hunger) with language learning aligns the promotion of food security and sustainable agriculture with the language learners to develop ideas in other language about the awareness of Global Food Security. As teachers, some ideas include analyzing texts about global and local food and agriculture or researching focused on impact of sustainable farming. By this way, students can find a chance to improve their vocabulary and discuss their ideas in the target language.

Goal 3 (Good Health and Well-being) can be also linked to language development. Language teaches can provide the opportunity for their students to develop an understanding of health literacy in other language. Some health activities can be easily incorporated into the curriculum, for example, analyzing and discussing health-related texts, speaking about health issues, or creating/exchanging information on social media about healthy living. Besides, Goal 7 (Affordable and Clean Energy) and Goal 12 (Responsible Consumption and Production) can also subtly be integrated into the syllabus by opening up discussion on renewable energies and ways of saving energy, together with sustainable consumption (IEA, 2019). Students may do projects—for instance, research and present on sustainable energy solutions to heighten awareness about clean energies, waste management, and at the same time improve their English. These activities may involve discussing case studies of waste management or developing campaigns that ensure responsible consumer behaviors (UNESCO, 2021). According to a study by Saavedra and Opfer 2012, such integration has the benefit of promoting deeper understanding and generation of ideas for solving problems in the real world. Accordingly, sensitizing learners to critical global issues, as represented by the SDGs, enables them to gain a sense of responsibility for fostering a sustainable future. Considering these goals, a language curriculum including the content of the SDGs can provide learners a more complete and substantial learning experience to participate and to achieve the global and local goals.

All in all, incorporating sustainability in language education is not just a great idea, but a crucial component to the educational mission of equipping students with global competencies. In the Global Education Monitoring Report (2016), it is noted that education orientated towards sustainability is the best economic investment to prepare students for responding to tomorrow's challenges and to what the future of our planet needs. This means incorporating sustainability principles into the education system, such as the ones proposed by language education on sustainability, is not an addition but a radical turn in harmony with the broader purpose of educating well-informed and engaged global citizens. The research by Sterling (2001) on the contribution of teaching for sustainability in schools to students' critical thinking and problem-solving skills also substantiates this view. In the same vein, Yu et al. (2024) argue that introducing sustainability ethics and values into the language classroom environment prompts students to re-orient themselves from a language learning activity to acting on real world issues. Moreover, Mambu (2023) explored an English language teacher's effort in his critically oriented undergraduate course to introduce SDGs as a tool for his Indonesian students to foster criticality through ELTL. Kuusalu (2023) also explored transformative language teaching for sustainability (TLS) and demonstrated how modern, learner-



centered language instruction can cultivate essential competencies and skills required to achieve the objectives of education for sustainable development (ESD). If language education on sustainability is grounded in topical real-world problem-solving, or critical appraisal of our attitudes towards consumption, for instance, learners are not only connected to real life; they are also given the power to make a difference.

It is clear that the body of literature on sustainability in English language education is increasing. It has become essential to regularly read academic journals in this field, investigate the features of these publications, and analyze the citation networks between them using different criteria to catch up the current trends. However, it is so difficult to track so many publications, analyze citation or relationship networks among them and collaborative publications (Huang et al., 2020). The bibliometric analysis method, initially introduced by Pritchard in 1969, is a feasible approach for achieving this objective. It allows for a review of academic journals and articles through mathematical or statistical analysis, based on factors such as citations, topics, or the geographical distribution of authors (Yan & Zhiping, 2023). Considering this, the study aims to contribute to the literature related to the sustainability in English language education by investigating the current status and trends in the performance of this critical topic. using a bibliometric approach. Despite the growing debates on integrating sustainability into educational curricula, there is a significant research gap in understanding how sustainability is embedded specifically in English language teaching (ELT) curricula and practices. Relevant studies are mainly confined to a general education or environmental education framework, which leaves the interface between sustainability and ELT under-researched. This article addresses this gap by providing an extensive bibliometric review describing the trends, seminal works, and new directions in the field that could provide important insights to researchers and educators interested in promoting sustainability in foreign language teaching and learning. In line with this, the following primary research questions were developed to guide the search as shown below;

1. How is the sustainability in English language education concept covered in literature scope and how has the literature progressed so far?

2. Which countries, which researchers, which key topics are the primary focus in literature for sustainability in English language education concept?

METHODOLOGY

The study, as described by Baker et al. (2020), utilizes a bibliometric approach that incorporates both quantitative and qualitative features of literature. Bibliometric approach is an appropriate method used for research analysis and interpretation dealing with a large volume of scientific data, which can be regarded as a type of systematic review method (Kuzior, & Sira, 2022). Pritchard (1969) and Donthu et al. (2021) also add that bibliometric analyses reveal the current situation, trend, and progress of a particular research. In these studies, relevant academic journals and papers can be evaluated quantitatively or algorithmically to examine citations, topics, or geographical locations of the authors. Therefore, bibliographic databases have become more significant since they serve as the main repositories of publishing information and bibliometric indicators. These databases are extensively used for both research evaluation and day-to-day activities. Based on this, the study is expected to provide the foundations for future research on sustainability in English language education. As for the methods of the paper, the publications in the Dimensions database were reviewed, and the number of occurrences of the terms sustainability and language education was determined using the keyword citation count method. Next, keyword maps were generated using a mapping tool such as VOSviewer. Furthermore, the following analyses were conducted: (1) trends of total publications, citations and research topics; (2) the bibliometric analysis of keyword/network analysis; (3) bibliometric analysis of citations by countries; and (4) bibliographic coupling by authors.



Data Collection

For this study, a bibliometric analysis was carried out using the Web of Science (WOS) database to examine the patterns of publications under the title of sustainability in English Language Education from 2014 to August 2024. The Web of Science is an online platform that aids access to several databases that present reference and citation data from academic journals, conference proceedings, and other scholarly papers on all academic fields (Birkle et al., 2020). In this study, different search algorithms were used to ensure full coverage of the literature on English Language Teaching (ELT).

To ensure good coverage, the researcher in this study used various search algorithms that would cover the literature on sustainability in English Language Education. The preliminary search was given as "sustainability" OR "English Language Education". The result was 3411 articles. Specific investigation retrieval was then used to filter the publication selectively. The data was saved by imposing the conditions of the publication year (2014–August 2024), document types, WEB of science index, and language. A total of 1523 articles out of 3411 were considered suitable for this study using the above methodology (Figure 1).

Data Analysis

The process of data extraction was carried out using a data extraction table designed in CSV format following the selection of the relevant research. The table encompasses several filtering options: publication year, language, journal, title, author, keywords, and citation counts. Content data analysis was adapted next after extracting the data. The findings were summarized and presented in appropriate tables and figures. The findings obtained were saved in CSV format for further analysis and visualization of bibliometric analysis using VOSviewer. As noted by Passas (2024), bibliometric analysis is a greatly applied, exhaustive method for the study and analysis of a large amount of scientific data. He further comments that another tool increasingly used in bibliometric research is visualization of similarities, designed to be clear and simple in presenting bibliometric maps. This strategy enables us to efficiently gather literature and determine the connections of the chosen articles among the alternatives. This research utilized a methodology to examine literature based on the accessibility of publications (open or closed access), the kind of publications (journals or books), network visualization using keywords, citation analysis by nations, and bibliographic coupling analysis by authors.

FINDINGS

1. Trends of total publications, citations and research topics

Trends in the number of published works

There were a total of 1523 publications discovered using the search protocol. Due to the study period starting in 2014, there is a scarcity of visible data until 2019. The graph depicted in Figure 1 illustrates the patterns of publishing from 2014 to August 2024. Based on the analysis, it is evident that there has been a substantial rise in research starting from 2020. In 2022, a remarkable number of 290 publications were achieved, making it the most productive year. One potential explanation for the significant rise in the quantity of articles on sustainability in English language education is the widespread research focus on incorporating sustainable development goals (SDGs) into language instruction and learning (Yu et al., 2024).



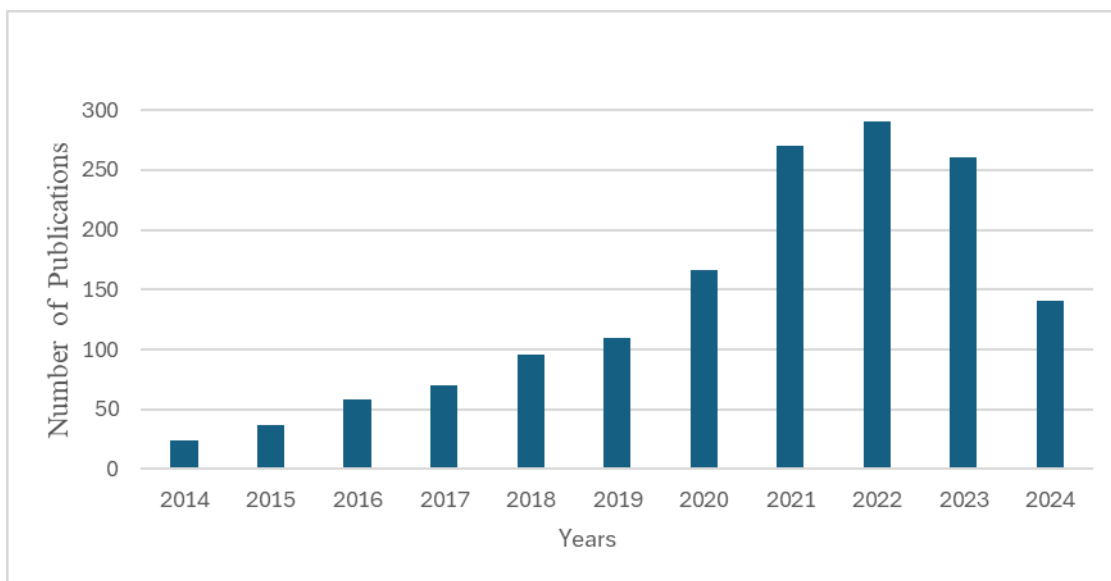


Figure 1. The number of publications by year

Top contributors and influential journals

The table below shows the top eight authors who have made significant contributions based on their publications. Meduna from Czech Republic and Zhang from New Zealand have a remarkable record of publications, making them the top authors in terms of quantity. Following closely behind is Burget, also from Czech Republic, and Pavelka from Czech Republic with a worthy 7 publications. They are closely followed by Gao, hailing from Australia, Plchot from Czech Republic, Křivka also from Czech Republic and Melor from Malaysia with 6 publications (See Table 1).

Table 1. Top 8 Authors Based on The Publications

| Name | Country | Publications |
|--------------------|----------------|--------------|
| Lawrence Jun Zhang | New Zealand | 9 |
| Alexander Meduna | Czech Republic | 9 |
| Lukas Burget | Czech Republic | 7 |
| Marian Pavelka | Czech Republic | 7 |
| Xuesong Gao | Australia | 6 |
| Oldrich Pichot | Czech Republic | 6 |
| Zbyněk Křivka | Czech Republic | 6 |
| Md Yunus Melor | Malaysia | 6 |

When it comes to total citations, Kralik from Slovakia emerges as the leader with an impressive record of 158 citations as demonstrated in Figure 2. Burget from Czech Republic with 134 citations is listed next.



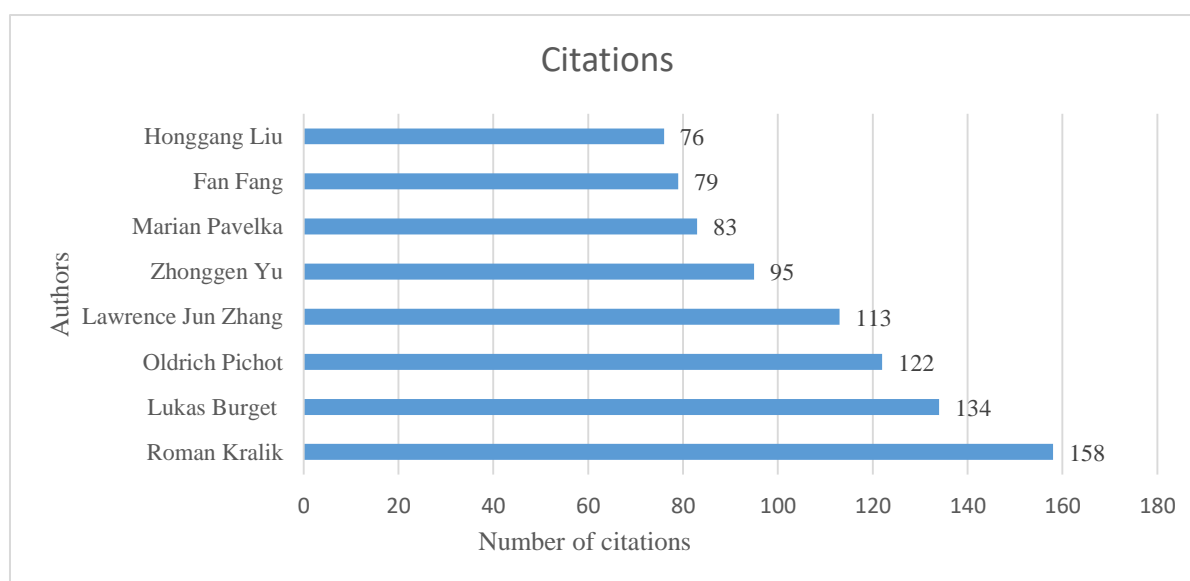


Figure 2. The number of citations by authors

Knowing the top influential journals is important from the perspective of future researchers. Table 2 below shows the most influential journals, with the top three journals being Sustainability with 498 publication titles, International Journal of Sustainability in Higher Education with 35 publication titles, and Journal of Cleaner Production with 22 publication titles. As it is clear from the results that Sustainability is well ahead compared to other journals.

Table 2. Top Influential Journals According to Publication Titles

| Name | Publication Titles |
|---|--------------------|
| Sustainability | 498 |
| International Journal of Sustainability in Higher Education | 35 |
| Journal of Cleaner Production | 22 |
| Environmental Education Research | 20 |
| People and Nature | 17 |
| Environment Development and Sustainability | 10 |
| Frontiers in Psychology | 9 |
| Plos One | 9 |

Top field of research topics

Some specific research topics that would further support the definition of the study have also been underlined here (see Table 3). In the field of "Education and Educational Research," there were 196 cited topics. Next is "Language and Linguistics " with 194 cited topics. These are areas in which the concept of "sustainability" and "language education" differ from that of education, demonstrating the life-changing potential it can bring to every single discipline related to learning.

Table 3. Top Fields of Research Topics According to Citations

| Name | Publication Titles |
|----------------------------------|--------------------|
| Education & Educational Research | 196 |
| Language & Linguistics | 194 |
| Management | 139 |
| Social Psychology | 76 |
| Forestry | 59 |
| Sustainability Science | 47 |
| Climate Change | 39 |



2. Bibliometric analysis of the keywords: Co-occurrence mapping

VOSviewer network visualization was employed to capture the keywords provided by the authors of the articles. Figure 1 presents the network of authors' keywords. Moreover, the group or the connection of phrases is represented by colour, circle size, text size, and line thickness. These keywords were selected in the Dimensions database with a minimum threshold of 10 occurrences. This visualization used co-occurrence mapping to represent relationships between these keywords, based on text-data. The size of nodes is proportional to frequency of occurrence. The colors of the visualization represent various groups of phrases, all combined under clusters. van Eck and Waltman (2017) state that while clusters show how the topics are connected, curves connecting the nodes illustrate the co-occurrence of these terms in the same publication.

The research showed that sustainability in language education was separated into five main clusters. These five main clusters are red, green, orange, blue, pink and purple, and they are much larger than the rest. The top emerging keywords in the clusters are *sustainability* with 167 occurrences and a total link strength of 166, *higher education* with 71 occurrences and a total link strength of 75, and *sustainable development* with 48 occurrences and a total link strength of 36.

Some of the main keywords of the red cluster are sustainability, climate change and professional development. The second cluster, represented by the green color, contains topics on sustainable development, sustainable development goals, qualitative research, technology, quality, management, and assessment as shown in Figure 3. The third cluster, shaded in orange, represents a whole range of topics that includes higher education, university, diversity, students, and digitalization. On the other hand, the blue cluster represents some topics such as English as a second language, transdisciplinary, and education for sustainability. While online learning, natural language processing, pandemic and Covid 19 are in the pink cluster, ChatGPT, health and environment takes place in the purple cluster. As these study areas have not yet been specialized, more generic concepts are still being investigated and researched. However, such terms will be useful to anyone researching with the aim of constructing search strings for bibliometric or systematic analysis, or even conducting research on ELT.



4. Bibliometric analysis of the bibliographic coupling by authors and sources

Bibliographic coupling is a method that brings together documents citing the same group of cited sources in terms of comparison of citing articles (Jarneving, 2007). The bibliographic coupling map with respect to authors and sources is presented in Figures 5 and 6, respectively. Three distinct clusters about authors are noticed with a different color in Figure 3A. The author Lawrence Jun Zhang comes from New Zealand, and he has the record of 9 publications with 113 citations and a total link strength of 32. Fan Fang and Honggang Liu from China have been following Lawrence Jun Zhang and they have the same record of 5 documents with 79 and 76 citations respectively and a total link strength of 299. Roman Kralik from Slovakia is another outstanding author who has 5 publications with 158 citations and a total link strength of 1. Xuesong Gao from Australia featuring among the top lists has 5 publications with 17 citations and a total link strength of 15. Harwati Hasim and Zhonggen Yu forming the last cluster have also the same record of 5 documents with 54 and 95 citations respectively. While Hasim has a total link strength of 21, Yu has a total link strength of 9. These results are very similar to the bibliometric analysis of citations as far as authors are concerned and indicate that all those authors are very strongly related to and influential in this research community.

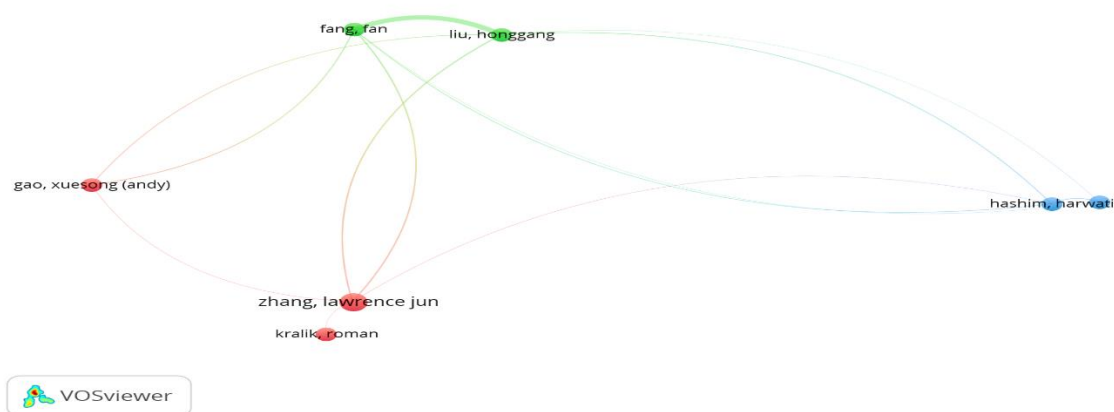


Figure 5. Bibliometric analysis for bibliographic coupling of authors

Regarding the analysis of the sources, clusters are depicted through the colors; orange, red, green, blue, yellow, and purple. The first source is titled “Sustainability” with the document number of 225 and a total of 3788 citations with a total link strength equal to 2029. The next source is titled “International Journal of Sustainability”. It is characterized by the document number of 35 with 249 citations in total and a total link strength of 1210. The other source is “Journal of Cleaner Production”, which has 22 documents with 898 total citations and a link strength of 300.



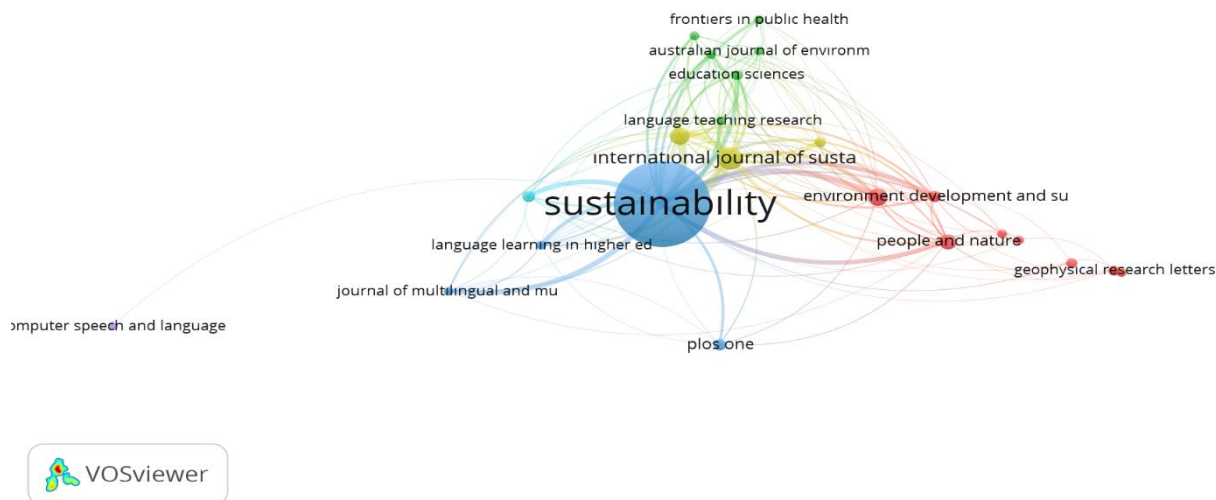


Figure 6. Bibliometric analysis for bibliographic coupling of sources

DISCUSSION

This comprehensive bibliometric analysis represents prominent trends and several important insights into the evolving landscape of sustainability research in English language education. In this sense, the study is very timely, as language education could indeed profoundly influence value, skill, and knowledge development among learners to become active problem solvers for many major global issues like climate change, social inequality, and environmental degradation. Integration of sustainability into language teaching can empower learners to acquire critical thinking, global awareness, and responsible citizenship so that they develop appropriate skills for the attainment of sustainable development goals. Moreover, since English is very much an intercontinental language nowadays, teaching sustainability will be useful in furthering between-culture understanding and collaboration—two highly relevant plans for engaging with the complex, connected issues that challenge the contemporary global community (Cordoba, 2024). As such, a growing stream of publications in this area not only contributes to the development of language education but also supports higher-level efforts toward greater sustainability and equity.

To expand further on, the trends of publications from 2014 to August 2024 clearly point out the prominent growth of sustainability in language education research. First, the field remained somewhat underdeveloped until 2019. It could simply be a question of time, as the integration of sustainability in language education is a rather new thing. Then, in early 2020, the tendency suddenly appeared in publications, reflecting an increased recognition given to such an interdisciplinary area (Yu et al., 2024). In particular, 2022 stands out as the most productive year, where 290 articles reached their peak. This strong growth in scholarly publications can be attributed to the wider global focus on the SDGs. As educational institutions and researchers increasingly frame their work in terms of these global targets, there has been a corresponding growth in research investigating how language education might help to achieve sustainability (UNESCO, 2020a). Furthermore, the emphasis on the SDGs in language teaching and learning is a significant shift in research interests away from the traditionally strategic language teaching and towards a broader concern for social objectives. This trend underlines that education in fostering sustainable practices and demonstrates the potential of language education regarding contributing to global sustainability initiatives (Kohl et al., 2022). As this field continues to develop and evolve, it is most likely that the number of publications is going to increase as scholars search for new ways on how sustainability can fit into language education frameworks. For instance, Meduna from the Czech Republic and Zhang from New Zealand turn out to be at the top when considering the number of publications; both contributed a really high number of



studies. Their high productivity reflects serious commitment to contributing further research in this area and thus probably makes them influential voices within the academic community. The next two contributors after Meduna and Zhang are Burget and Pavelka from the Czech Republic. No doubt, many of the top contributors hail from the Czech Republic, which is possibly a suggestion of the concentrated effort there within the Czech academic community for the exploration and development of sustainability and language education. This could be the proof of strong institutional support and a collaborative research environment within the country to foster research in this domain (Christou et al., 2024). Furthermore, Gao from Australia, Plchot and Křivka from the Czech Republic, and Melor from Malaysia underline the global character of this field of research. The fact that these authors are from different parts of the world underscores again the universal relevance of sustainability in education (UNESCO, 2020b). Climate change and sustainable development are important influential issues on the global agenda, whereby cross-cultural and international approaches to educational research begin to assume greater importance (Droubi et al., 2023). Their contributions to knowledge, therefore, on the basis of these top authors, provide a way not only for advanced academic research but also for practical applications that may benefit educational systems worldwide.

Regarding the top influential journals in the field of sustainability concerning English language education, the analysis revealed that “Sustainability” dominated the domain publications with 498 titles, far ahead of other journals. This dominance underscores this journal's lead in assuming a central role among key platforms to share research related to the integration of sustainable practice into education. Such broad focusing by the journal on sustainability issues likely explains its popularity among researchers seeking to explore interdisciplinary approaches within education (Yu et al., 2024). Following “Sustainability”, the “International Journal of Sustainability in Higher Education” and “Journal of Cleaner Production” are also recognized, though with a considerably smaller number of publications. That the fact these journals appear in the list of top contributing journals raises interests in the fast-building interest in ways of effectively applying issues of sustainability into the setting of higher education. Again, with regard to this study area, leading journals provide valuable insights on challenges and chances for advancing sustainability in educational institutions through research, which is not only theoretical but also practical and applicable across various educational contexts (Abo-Khalil, 2024). The clear lead of “Sustainability” would suggest that at least in the field, researchers prefer to publish in journals that provide broad, interdisciplinary platforms where their work can reach diverse audiences. At the same time, significant contributions from other specialized journals, suggest that there is also interest in more focused discussions about how sustainability principles may be embedded precisely within educational frameworks (Sterling, 2021). On the other hand, the topic research in sustainability for English language teaching underlines the scope and interdisciplinarity of the field. The top “Education and Educational Research” has 196 cited topics, demonstrating the central nature of education in promoting sustainability. This focus indicates that there is a growing recognition of the need to mainstream sustainability in learning processes if current competent skills and knowledge are to be developed to solve contemporary global problems (Parr et al., 2023). Closely following is “Language and Linguistics”, which represents another important area under study and points out how much attention is placed at the interface of language teaching and education for sustainability. The almost equal attention to these two areas—education and language—reflects the beginning of an understanding that sustainability is not something related either to the environment or to economics, but rather cuts across all fields of learning and communication (Brundiars et al., 2021). The findings also underpin how the combining of issues of sustainability into education and language disciplines is a highly promising space for transformative change. Through its embedding within educational frameworks, it provides learners with critical thinking skills and global awareness to navigate and address a lot of life's most complex problems (Ahmad et al., 2023). In the same way, embedding sustainability in language education will create an avenue for increasing learner perspectives and responsible communication practices that are more ethical in nature.

Moreover, the bibliometric analysis of keywords through co-occurrence mapping gives some very important clues to the thematic structure of research on sustainability in language education. There were five distinct clusters of keywords identified through VOSviewer. Each of these clusters



captures a unique thematic focus within the broader landscape of the research under consideration. This clustering not only underlines the diversity of topics under exploration but also underscores their interrelatedness with respect to sustainability and language education. To be more precise, the red cluster, with "sustainability," "climate change," and "professional development" as very prominent keywords, describes the grass-roots constituents for what integration means within the education for sustainability field. These themes are relevant to knowledge about how language education might contribute to larger environmental and social targets (Yu et al., 2024). It is understood that, with the strong emphasis on sustainability in language education, there would be a great commitment to the development of educators and learners themselves for better preparation regarding the upcoming global challenges (van Eck & Waltman, 2017). On the other hand, the green cluster appears to be oriented towards "sustainable development," "sustainable development goals," and "qualitative research," thereby showing that interest is increasingly growing in language education, taking into consideration the United Nations' Sustainable Development Goals. The fact that technology, management, and assessment-related keywords have emerged shows interest by researchers in innovative practices and methods of measurement to strengthen analysis for sustainability activities within education settings. Within this orange cluster—with keywords such as "higher education," "university," "diversity," "students," and "digitalization"—one is able to deduce how institutions of higher learning change their role in their pursuit for sustainability. This cluster thus brings out the role of diversity and digitalization as key partners in shaping education into times ahead when sustainable practices in higher education are increasingly viewed in the light of inclusivity and technological advancement (Brundiers et al., 2021). The blue cluster, with keywords like "English as a second language," "transdisciplinary," and "education for sustainability," chimes in with the function of language education underpinning interdisciplinary approaches toward sustainability. The language education argued here is not only a medium for communication but is also taken as a critical tool in bringing plural disciplinary perspectives on sustainability (De la Fuente, 2022). The pink and purple clusters deal with contemporary and emerging issues. The pink cluster, with keywords such as "online learning," "pandemic," and "natural language processing," reflects the turns of education as a result of COVID-19. This cluster gives more emphasis on digital tools and remote learning as maintaining educational practices through crises. The purple cluster, including "ChatGPT," "health," and "environment," has been indicating an emerging interest in the intersection of language technology, health, and environmental sustainability. The cooccurrence mapping of the keywords finally reveals a complex and dynamic research landscape in which traditional topics are being enriched with new interdisciplinary approaches. From this place, these findings supply a kind of map that would provide future research directions, listing areas where sustainability and language education come into contact most dynamically and thus lay a foundation for constructing targeted research strategies within this fast-developing field.

What is more, the bibliometric analysis of citation by countries and organizations depicts how research on sustainability in the teaching of the English language is currently being conducted globally. It is indicated that a good number of research is the product of EFL and ESL countries. The result underlines the developing importance of integrating concepts of sustainability into English language teaching within different linguistic and cultural contexts. It means that China was the largest contributor, with a total of 322 publications and 4,130 citations, showing this country's large contribution to the growth in the development of research into this topic. This is further validated by the contribution of the United States and England, both native English-speaking countries, into this research domain. With 213 publications and 3,708 citations, the United States, together with England, having 110 publications and 1,405 citations, shows that research on sustainability in English language teaching is also gaining ground in countries where English is the native language. Other non-native English-speaking countries, Spain and the Czech Republic, that have contributed significantly demonstrate that there is a general interest in the subject area stemming from all regions. The organizational analysis identified important contributions from institutions such as Charles University in Prague and Tokyo University, both of which contribute a sizeable number of documents and citations. In other words, these institutions are among the biggest contributors toward supporting research into sustainability within language education, probably thanks to dedicated research programs or collaborative networks focused on this theme. To summarize, the bibliometric analysis of the



citations by the country and organization thus reflects a vibrant research landscape that is truly global. Evidently leading are EFL and ESL countries, while native English-speaking countries and key academic institutions deliver important contributions to collaborative and interdisciplinary research on sustainability in English language education. These results are a map of the current state of the field, but also a guide for future research studies and potential international collaborations.

Furthermore, the bibliometric coupling analysis by authors and sources brings out the solidarity of the research community. All the authors, such as Lawrence Jun Zhang, Fan Fang, and Honggang Liu, are located very close to each other and hence highly connected through a collaborative network. The link strength of the highly cited authors, for example, Roman Kralik, is relatively low, thereby indicating that although their work has huge impacts, they have narrow scopes or are less related to other parts of the research network. It can be seen that "Sustainability" is leading in the ranking both by publication titles and in total link strength, which more definitely defines its position as a central hub of research into sustainability. Strong coupling between sources like the "International Journal of Sustainability" and the "Journal of Cleaner Production" with "Sustainability" means that these journals have been frequently cited together, and therefore, there is a coincidence of interests in research and interest in themes related to sustainability.

All in all, the results of this study are expected to highlight the trends and patterns in sustainability research in EFL teaching, analyzed with various bibliometric methods. These patterns provide insight into the evolution of this field, the influence of key contributors, and the central themes that have driven recent scholarly discourse.

CONCLUSION AND SUGGESTIONS

This comprehensive bibliometric analysis points to key trends and insights into the dynamic evolving landscape of sustainability research in English language education. Further consideration given to the issue of the significance of the present research makes it clear that sustainability in language teaching is not an academic end but an important prerequisite for how future generations can work on global challenges such as climate change, social inequality, and environmental degradation. Sustainability has to be integrated into English language teaching because language is such a powerful tool in the way human beings think, express themselves, and engage with the world.

Seeing that English is an international lingua franca, the ways it is being taught will have far-reaching implications both for researchers and educators. By making language education integrated with ideas of sustainability particularly making necessary changes on language curricula or faculty development programs, educators can provide learners with knowledge that makes up a critical base of thinking, global awareness, and ethical frameworks in which contemporary complexity will be understood and addressed. In fact, this approach offers more than just enhanced language proficiency, as it gives students a deeper sense of responsibility and active citizenship and sensitizes them to be meaningful contributors to sustainable development goals (SDGs). Therefore, it is important that educators be oriented regarding sustainability in their practice and make attempts toward the achievement of the SDGs through innovative language approaches. For example, sustainability-themed texts such as novels, articles, and documentaries that address environmental and social issues can be integrated into the lesson. Moreover, fostering engaging discussions related to sustainability and enriching relevant vocabulary will not only help students develop a sense of ownership and responsibility towards their environment but also improve their language skills. This can also be supported by the help of authentic contents via news articles, podcasts, or even TED Talks on ecological topics, which will foster critical engagement with real-world issues. Finally, students can organize virtual exchanges with students from several countries to discuss one of the key challenges related to sustainability, which will enhance their intercultural understanding and improve their conversational skills. It is clear that the increased research in this area is a necessity for further progress in education methods contributing to the global effort toward a more sustainable, equitable, and inclusive world. For researchers, this study reinforces the fact that, as time passes, the importance of interdisciplinary approaches linking sustainability and language education will only grow in



importance, thus indicating that future research should further continue the pursuit of inquiry in this area.

While this article has undoubtedly added valuable insights, there are many areas that require further research. Future research should be conducted, for example, on explicit pedagogical approaches and teaching strategies in the integration of issues of sustainability into language education. Although this study has pointed out the growing interest in this area, it still lacks many empirical studies that examine the influence of these approaches on learners' sustainability literacy and general linguistic proficiency. Further research may be done on how digital tools and technology support—for example, online learning platforms or natural language processing—might enhance the effectiveness of education for sustainable development in language classes. Comparative studies across different cultural and linguistic contexts will help this domain of research understand better how to tailor sustainability education for diversified learners across the globe.

This study is not without its limitations. First, it limited itself to studies indexed in specific databases. This points to a limitation: relevant studies published elsewhere could have been missed in the analytical process. The focus on English language education, though deliberate in nature, further limits the findings' generalization possibilities to other language education contexts. The fact that this research is exclusively based on bibliometric methods is also a limitation, as it only allows the indication of trends and patterns but does not give any deep, qualitative understanding of the content and impact of the research under scrutiny. In this respect, future studies should focus on sampling different sources, representing other language education contexts, and complementing the bibliometric approach with qualitative analysis to reduce these limitations.

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