

# ESL STRATEGIES: BIBLIOMETRIC ANALYSIS THROUGH SCIENTIFIC MAPPING IN WOS AND SCOPUS AND NETWORK ANALYSIS

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## INTRODUCTION

Language learning strategies are crucial for learning English as a foreign language (EFL) (Leba et al., 2021). The field of language learning strategies has grown significantly, experiencing many twists and turns over the years (Thomas et al., 2021). The need to investigate writing strategy use in different socio-cultural contexts has been suggested as one of the primary themes in L2 writing research (Hosseinpur & Kazemi, 2022) not knowing how to control the anxiety of learning a language must be harmful so, educators must emphasize a variety of different learning strategies, depending on the speaking anxiety level of their students (Munchen et al., 2021)

The objective of this analysis is to go deeper into the language learning strategies used in virtual environment. According to (Malpartida et al., 2021), who recalls (Alhaysony, 2017; Taheri, Sadighi,

**ABSTRACT:** The field of language learning strategies has been growing interest in students who tend to recall them to learn more effectively and faster a language. In some cases, learning a language causes traumas and not knowing how to control the anxiety, follow motivation and keep up with the task can be overwhelming. In this review, the most frequently used strategies in language learning have been examined. The articles reviewed were from 2000 until 2022 across two databases, Scopus and Wos. The methodology used in the review was bibliometric analysis. From the review, it was found that students use their language learning strategies according to their language level and the skills they try to master. More studies should cover this area in order to start applying common and useful strategies in regular classes.

**KEYWORDS:** language teaching, Bilingual

Bagheri & Bavali, 2020), 'other studies show that language learning strategies and English proficiency have been mainly researched in face-to-face higher education settings' and (Mizhe et al., 2021) several study limitations were identified (uneven regional studies, insufficient research samples, single research methods, and lack of theoretical paradigms in training learning strategies. According to (Almusharraf et al., 2021), there is a need to identify the relationship between learner characteristics and reported levels of language learning strategies and examine the influence that self-efficacy, instrumental motivation, effort and persistence, and preferences to analyze the language learning strategy needed.

Educators need to look for the most suitable teaching method in the current learning environment through the identification of the language learning strategies (LLS), which are conscious behaviors used by language learners to foster the acquisition, storage, and use of new information, although there have been several reviews of the field's output, few have targeted research in a specific context (Thomas et al., 2021) Motivational strategies have been recognized as a crucial but insufficiently explored component in the second language (L2) learning(Lin et al., 2021; Thomas et al., 2021)

Informing students about how, when and why strategies are used enables them to apply strategies in different learning tasks and transfer the implementation of strategies in new contexts and tasks, which is extremely important in autonomous learning of professionally oriented English communication for intending educators (Dmitrenko et al., 2020) cited by (Dmitrenko et al., 2021)

The methodology used to achieve this goal is first looking at Scopus and WoS, a couple of databases containing a wide list of references and authors. While that was done, a research on Scimago and the ranking of the journal were the paper was placed and finally an elaboration of some seeds which later on, were loaded to R cloud and used to gather graphics to finally be interpreted.

In this article, there is a criteria to be considered, a summary and an introduction in which the need for research is explained, and then an analysis based on the seeds gathered is presented.

## **METHODOLOGY**

The methodological process developed involves two big steps: first, scientific mapping of the area, which is carried out through a bibliometric analysis of the scientific production registered in Scopus and WoS, and second, network analysis that allows identifying the most relevant documents on learning strategies and establish the main groups in which research in the area is currently framed.

## **SCIENTIFIC MAPPING**

To carry out a production analysis and scientific mapping, the five bibliometric

methods suggested by (Zupic & Čater, 2015) are used: citation analysis, word co-occurrence analysis, co-citation analysis, co-authorship analysis and bibliographic coupling analysis. The two databases were used together because according to (Echchakoui, 2020) it allows us to have a broader view on the topic it is being studied. Wos and Scopus are also well known around the world according to (Pranckutė, 2021; Zhu & Liu, 2020).

The search parameters are listed in the following table:

Bases	Scopus	WoS
Periodo de consulta	2000-2022	
Fecha consulta	27 de enero de 2022	
Tipo de documento	Artículo, libro, capítulos de libro, actas de conferencia	
Tipo de revista	Todas	
Campo de búsqueda	Titulo	
Terminos de búsqueda	"language learning strateg**"	
Resultados	300	158
Resultados generales	360	

Table 1. Research Criteria

These search criteria yielded 158 records in WoS and 300 in Scopus, which finally became 360 because there was an overlap of 27,3 % between these two databases. R cloud was used to see how many of them were twice. The terms 'language learning strateg\*\*' were intended to cover the largest number of records within these databases by including in the search parameters. As a result, 88% of publications in this area were found in English, and that can be because according to (Vera et al., 2019), magazines and authors use that language to be more visible in the learning community. The files found in Spanish and German are just 4% of the publications that were gathered.

language <chr>	percentage <dbl>
ENGLISH	0.88
GERMAN	0.04
SPANISH	0.04
TURKISH	0.02
UNSPECIFIED	0.02
OTHERS	0.00

The tool used for the bibliometric analysis is Bibliometrix which is a free tool, according to (Aria & Cuccurullo, 2017), because it allows working with different databases taking into account all its properties. It has also been used and validated by other types of research (Acevedo et al., 2020; Di Vaio et al., 2021; Duque, Samboni, et al., 2020; Duque, Trejos, et al., 2021; Landinez et al., 2019; Queiroz & Fosso Wamba, 2021; Secinaro et al., 2021; Tani et al., 2018).

## NETWORK ANALYSIS

Once the records obtained in WoS, and Scopus were merged and duplicates were eliminated with the Software R, the bibliography was gathered, and a network of citations was structured using graph theory as a model, which is a technique that facilitates the generation of information on the typology and characteristics of the network, as well as all the documents that comprise it (Wallis, 2007; Yang et al., 2016).

Subsequently, three bibliometric indicators are calculated: the Indegree (number of times that a document has been referenced by others (Wallis, 2007)), the Outdegree (number of times that a particular node cites others or the number of connections of each document otros (Wallis, 2007)), and the Betweenness (degree of intermediation and centrality of each element within the network (Freeman, 1977)), The betweenness takes place when one file is referenced, and It references the others (Zhang & Luo, 2017).

The knowledge network of this area is the result of all the documents obtained from the databases and their respective references, which implies that those results come from multiple sources that are not only part of WoS and Scopus but also from other databases and scientific publications. This co-citation map allows the visualization of the structure of a knowledge area. It makes easier the identification of its sub-areas or research currents (Gurzki & Woisetschläger, 2017; Zuschke, 2020) to facilitate the graphic visualization of the knowledge network of the study area on learning strategies, the Gephi tool is used (Bastian et al., 2009).

The indegree, outdegree and betweenness indicators are calculated for each network record, allowing its classification using the tree metaphor (Robledo et al., 2014; Valencia et al., 2020). Taking this analogy into account, three categories emerge: The roots (high indegree), where classic documents are observed, especially contemplating publications that are cited but do not cite others (Wallis, 2007). Then there is the trunk (high betweenness), there are documents that cite but at the same time are cited by others (Zhang & Luo, 2017); in this component, the structural works are grouped, which connect the theoretical foundation of the classics with this research. Finally, the leaves (high outdegree), focus on the most recent documents, and that the others cite (Wallis, 2007), This methodological procedure has been used and validated in previous studies (Buitrago et al., 2020; Clavijo-Tapia et al., 2021; Duque, Meza, Giraldo, et al., 2021; Duque, Meza, Zapata, et al., 2021; Duque, Toro, et al., 2020; Duque & Cervantes, 2019; Ramos et al., 2021; Rubaceti et al., 2022; Torres et al., 2021; Trejos-Salazar et al., 2021).

# RESULTS

## Bibliometric analysis

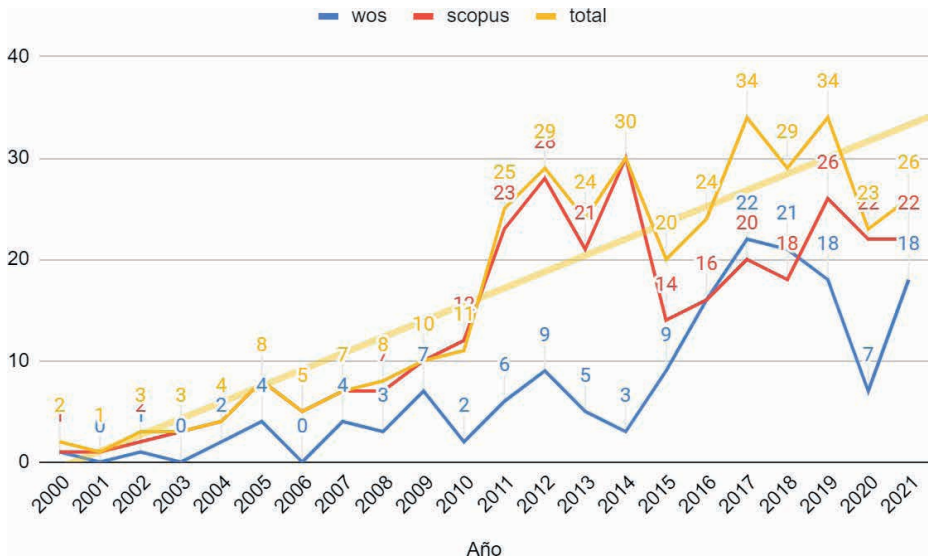


Figure . Publication number per year

Publications started to grow in 2011 dramatically. The highest number of publications was 34 in 2017 and 2019. Still there were years in which the publications on learning decreased; for example, 2015 only came to 20. By reading the Scopus final results per year, it could be assumed that 2014 was the year in which there were more publications on that area, while in Scopus, it was 2017 and 2018, the years in which the production of papers increased.

## wos, scopus y total

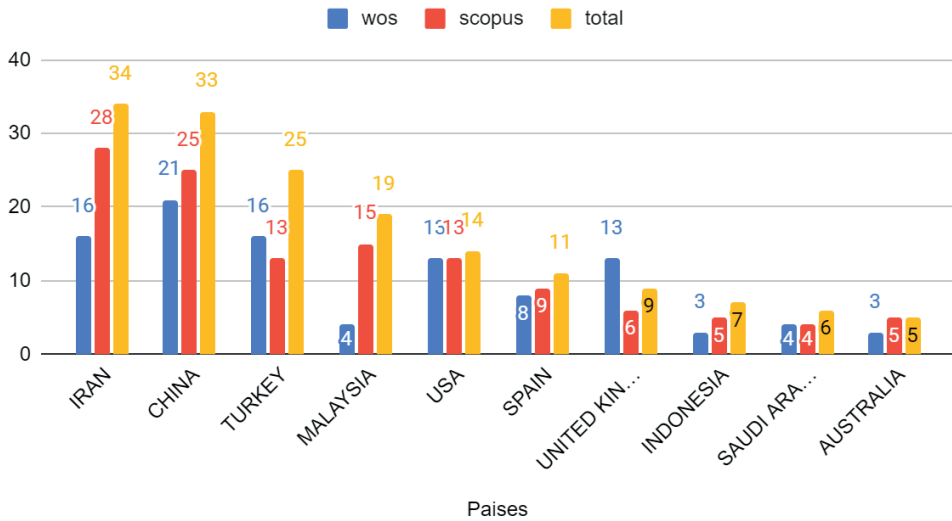


Table or figure. Production by Countries

Countries located in Asia command the topic of learning strategies. In contrast, Europe and the rest of the countries can only have a dozen articles written, collaboration between authors from the same nationality is also evidenced. There are some curiosities, such as the fact that authors from the trunk in the science tree and work in South America end up adding publications and numbers to the country they are originally from.

journal	publications	database
1 ENGLISH LANGUAGE TEACHING	20	scopus
2 SYSTEM	20	scopus
3 LANGUAGE LEARNING JOURNAL	14	scopus
4 ASIAN EFL JOURNAL	13	scopus
5 THEORY AND PRACTICE IN LANGUAGE STUDIES	13	scopus
6 INTERNATIONAL JOURNAL OF APPLIED LINGUISTICS AND E...	10	scopus
7 STUDIES IN SECOND LANGUAGE LEARNING AND TEACHING	9	scopus
8 LANGUAGE LEARNING AND TECHNOLOGY	8	scopus
9 INDIAN JOURNAL OF SCIENCE AND TECHNOLOGY	6	scopus

Table. Major magazines

System is the main journal in this field; this magazine has a classification of Q1 in Scimago and gathers around 20 publications in this field and not far away is English Language and Teaching and Theory and Practice in language studies which is also Q1 in

Scimago and also holds a number of 20 publications.

The top of the magazines has more than five publications compared to the one that takes place as the third magazine in the ranking of journals in language learning strategies.

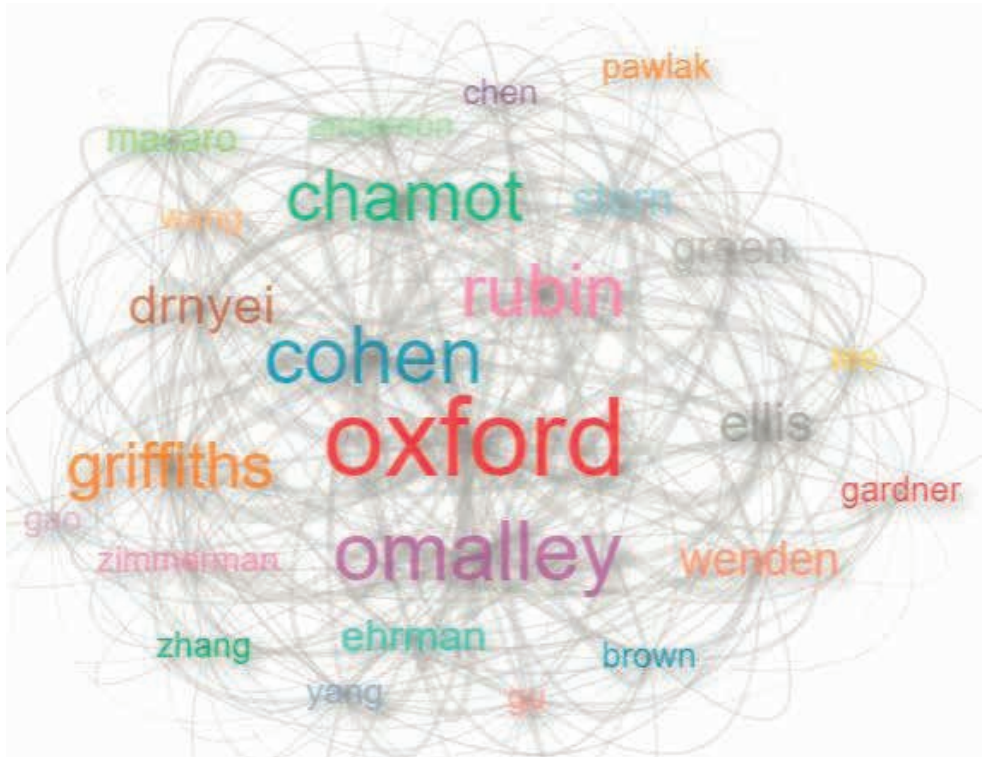


Table. Main authors by database

The main authors in this language learning strategies area are Miroslaw Pawlak, Carol Griffiths and Rebecca Oxford. They have more than six articles each one also, by the research done in Google Académico, It can be inferred that Griffiths worked with Oxford in 2014 and published two articles in the journal System, in 2016 she published with Incecay in the journal New Directions and in 2020 she published alone in the journal Applied Linguistics. At the same time, although Pawlak is the most published author, Griffiths has more than 100 points more citations than Pawlak. Oxford is the most cited author with more than 4500 citations which is nine times higher than Pawlak, the most published author.

In this collaboration network, it can be seen some of the authors have been working together, and they enjoy publishing by teams as well. In the figure on the bottom, it can be seen the highest work is done between the authors in green in this net, authors have been working together from 2014 until 2019 on AIP Conference Proceedings. Although Sulaiman has the highest H index, which is 17, at the same time, He is ten times more cited than the

authors in the green net. In this figure, also, a strategy to grow up in terms of research can be analyzed. For instance, authors who do not usually work together tend to look for more popular authors to increase their popularity levels in the field.

One of these examples is seen in authors who are not even shown in the image because of their number of articles is just a few.



Figure. Collaboration network between authors.

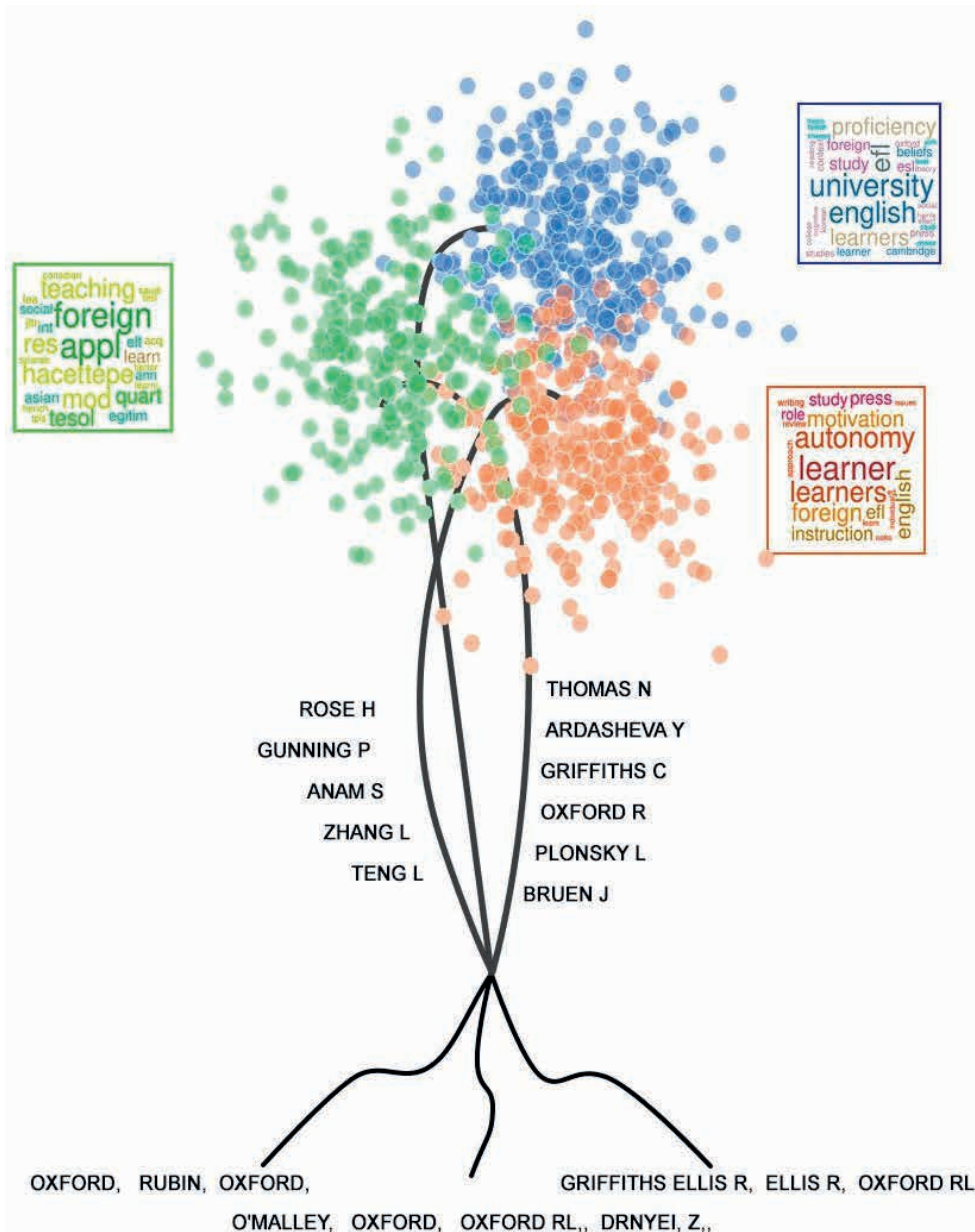


Figure. Collaboration network between countries

In this figure of collaboration network between countries, it can be seen how Asia leads the research although they are linked to North America and Europe. There is a connection that is not usual, and that is India with Chile, but as explained before, it is a







Science Tree Analysis

Through the science tree analysis, it was possible to catch the most relevant documents in the area. The documents were selected because of their relevance in the field. For this review, the documents with the highest indicators were selected: ten classics (roots), ten structural (trunk) and ten (leaves). In order to establish the sub areas or common areas of research, the proposed clustering algorithm was developed (Blondel et al., 2008) in

this way three main groups are identified, which can be represented on the leaves.

## **ANALYSIS OF THE ROOT**

Various research on learning strategies have been developed over the last five decades, and important issues such as the classification of strategies, the relationship between strategy use and student progress, among others, have been defined, (R. L. Oxford, 1989; Vanniarajan, 1990) defines a language learning strategy as the way a learner communicates. (R. Oxford & Nyikos, 1989) are really into knowing what strategy the student selects (R. L. Oxford, 1982) focuses on how students learning gets lost or forgotten also, an inventory is created by (R. L. Oxford & Green, 1995) what is more (R. L. Oxford, 1989) just studies the good learners, the ones that become successful as (R. L. Oxford, 1989; Rubin, 1975; Vanniarajan, 1990) just like (Rubin, 1975) who argues that a lot can be gathered from the students who are great, (R. L. Oxford, 1992) says that students in Iran focus on metacognitive ones, (Wagner, 2007) says that there are several individual differences like personality, temperament, and mood and they may change the strategy used.

## **ANALYSIS OF THE TRUNK**

This category deals with research publications on the subject of learning strategies, which are connected with the previous ideas that emerged from classical authors on this subject.

Self-regulation remains a fundamental pillar in the development of research related to learning strategies in recent years. However, it has been a difficult construct to understand. According to (Teng and Zhang 2016)and (Teng and Zhang 2016; Thomas and Rose 2019) who point out that there is a need to separate the concept of self-regulation and self-directed learning, as there is a tendency to confuse and confuse their relationship with learning strategies. In addition to this, (Plonsky 2011) considers that it has no conclusive.

On the other hand, (Anam and Stracke 2016) in his research reveals that young learners report active use of socio-affective and metacognitive strategies and moderate use of cognitive strategies. Among the preferred strategies are learning from others and regulating one's own learning, while among the least preferred strategies are memorizing words and practicing outside the classroom. In addition (Bruen 2001) points out that, the results of more proficient learners are due to the fact that they use more language learning strategies, in particular more cognitive and metacognitive strategies. In this way, (Rose et al. 2018) After consulting more than 1000 research articles he comments that there are many qualitative and quantitative methods to explore the issue of learning strategies and that the use of strategies is positive in the results obtained by students, as well as (Gunning and Oxford 2014) who concludes that the awareness and use of strategies helps students

positively in learning foreign languages.

Perhaps, this is due to the support of (Gunning and Oxford 2014) who points out that there is a strong relationship between metacognition and the success of learners who know what learning strategies they develop in their learning process. While it is true that it is essential to investigate the needs related to learners, it should not be forgotten that, according to(Gunning and Oxford 2014) the emotions of researchers and teachers should be complemented by the diversity of complementary perspectives on language learning strategies.

On the other hand, (Gunning and Oxford 2014; Griffiths and Oxford 2014)comments that the controversy is not only in the definitions of strategy but also in strategies and competence, theoretical foundations, categorisation, context, teachability, research methodology and analysis. Another controversy has arisen in data collection, although psychometric analyses, according to (Ardasheva and Tretter 2013) have benefited the research process.

## **LEAVES (PERSPECTIVES)**

With the bibliometric review process carried out, there are 3 main sub-areas (clusters), emerging in this field of study, which denote the most recent lines of research. Each of them is presented below.

### **PERSPECTIVES CLUSTER 1**

In this cluster, there is a thought which can be handled as the importance of gender, personality and language proficiency in the use of learning strategies, authors claim the importance of treating each individual as a different person, and teachers can make use of the already listed strategies to be able to classify each one of the learners and match with his/her the strategy that better suits the learning situation.

### **PERSPECTIVES CLUSTER 2**

In this cluster, there is a tendency to talk about motivation and different kinds of strategies such as the social, the compensatory and the ones that deal with self-regulation and efficacy. Most authors are worried about the context they are in; they feel that is needed in order to help students to learn better and faster. Even teachers in the middle east are exploring how students would learn quickly and without suffering.

### **PERSPECTIVES CLUSTER 3**

These authors work more in terms of autonomy and instruction. They do worry about implementing the language learning strategies in their classroom. That is why, they match

the English Language Abilities with the methodology they are trying to use. A couple of them focus on autonomy to reach objectives in the learner's way.

## **CONCLUSIONS**

In this paper, strategies in language learning were examined through a bibliometric analysis. The articles reviewed were from 2000 until 2022 across two databases, Scopus and WoS, and then, after looking for them in both places, the final result was given: 158 records in WoS and 300 in Scopus which finally became 360 papers where authors, co-citation, countries and journals were considered.

The language in which this topic is worked is English. The countries that have been working on this are located in Asia. The journal that published the most on the topic was system and the author who has a bigger database was Rebeca Oxford.

Around fifty years of work have been used to promote the classification of the learning strategies and the relationship between strategy use and student progress. (Pawlak, 2021) Argues there is a need to research in real classrooms and find new information that can be articulated with what has already been published. Learning strategies are helpful to educators, teachers and students and even an index to measure how beneficial that is. The metacognitive strategies are used over the cognitive or social ones. There is a need to update conceptualizations because the research is old. The least used strategies by learners were memory and affective strategies.

For future research, an extensive review of the use of learning strategies for other learning skills could be carried out. There is a need to investigate whether there is or not a relation between self-reported learning strategies and language proficiency.

## **LIMITATIONS AND RECOMMENDATIONS:**

There are three recommendations for further research. First, it is the natural way of handling research just because of the way of being, the second one is the fact that just two databases were used and there could be more into other databases so, that is the second suggestion, the final would be no working on r cloud or bibliometrics but in other programs to corroborate that what has been done is accurate.

## AGENDA OF RESEARCH

Perspective	Topic	Reference
a replication of this study with different population, if possible a larger sample to increase the power of the statistical tests, is suggested interviews and observations together students' beliefs towards learning strategies	Statistical tests	(Mokhtari, 2020)
Relate the skills with the needed learning strategy (vocabulary, grammar)	Learning Strategies	
Future studies that include English proficiency as a variable may be able to provide a more comprehensive elucidation of LLSs, AGOs, and the correlations that exist between them	Comprehensive elucidation of LLSs, AGOs,	(Shyr et al., 2017)

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