ENGLISH LANGUAGE TEACHING AND LEARNING TECHNIQUES APPLIED TO HIGHER EDUCATION STUDENTS: IN THE AGE OF ARTIFICIAL INTELLIGENCE

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Abstract
Through this document, it was possible to analyze the main characteristics of the volume of scientific production regarding the study of the variables English Teaching, Higher Education and Artificial Intelligence. A bibliometric analysis was proposed to analyze details such as Year of Publication, Country of Origin of the publication, Area of Knowledge in which the published research is carried out and the Type of Publication most frequently used by the authors of each document published in high-impact journals indexed in the Scopus database during the period between 2017 and 2022. Among the main findings, it was possible to determine that, for the execution of the different research methodologies, the report of 61 scientific documents related to the study of the application of tools derived from technological advances in Artificial Intelligence at the service of Higher Education,
properly in the teaching of the English language, was achieved. The maximum number of publications in a year was 28 papers submitted in 2022. The country of origin of the institutions that reported the highest number of records in Scopus was China with 41 documents. The area of knowledge with the greatest influence at the time of executing the research projects that resulted in scientific publications was Computer Science, which contributed great theoretical material in a total of 44 publications. Finally, the type of publication most frequently used to publicize findings from the analysis of the aforementioned variables was the Conference Article, which represented 49% of the total scientific production.

Palabras clave: TEACHING ENGLISH, ARTIFICIAL INTELLIGENCE, HIGHER EDUCATION.

1. INTRODUCTION

Currently the learning of the English language is a latent need in the student community, thanks to any process derived from the effects of globalization, and the recognition of this language as the universal language, with which a close relationship is preserved in international scenarios, therefore university students identify the obligatory nature almost of English proficiency, as an added value to their Resumes and a better performance within the execution of tasks related to their professional careers. Therefore, higher education institutions have understood this need and have sought ways to integrate the teaching of English with professional training, and a very useful tool within this objective has been the implementation of digital resources within the fulfillment of academic objectives. These tools, today manage to involve principles of Artificial Intelligence in the feeding of data supplied to educational systems that achieve the interpretation of student behavior within digital platforms, thus identifying the individual needs of each of the actors involved in the teaching-learning process. This information collected by teachers is processed in order to individualize the most efficient methodologies in training for English language proficiency, which represents a very important advantage in ensuring success in this process. Therefore, it is important to know what is the impact generated by the study of Artificial Intelligence based on teaching methodologies for training in a second language, in this case English, recognizing the importance of handling that language in a globalized world. It is expected with the execution of this research work, to know the details regarding the volume of publications registered in Scopus regarding the study of the subject raised above, within which it is expected to identify the year in which it has mostly been published in this regard, which have been the countries globally that have developed more research projects related to the use of technological tools in the teaching of English in the university students, as well as the position of different authors in the face of the latent reality in the new demands that come from each see more diverse needs within the student community.
2. GENERAL OBJECTIVE
Analyze from a bibliometric approach, the characteristics in the volume of scientific production related to the variables English Teaching, Higher Education and Artificial Intelligence, registered in Scopus during the period 2017-2022.

3. METHODOLOGY
This article is carried out through a mixed orientation research that combines the quantitative and qualitative method.

On the one hand, a quantitative analysis of the information selected in Scopus is carried out under a bibliometric approach of the scientific production corresponding to the study of English Teaching, Higher Education and Artificial Intelligence.

On the other hand, examples of some research works published in the area of study indicated above are analyzed from a qualitative perspective, starting from a bibliographic approach that allows describing the position of different authors against the proposed topic.

It is important to note that the entire search was performed through Scopus, managing to establish the parameters referenced in Figure 1.

3.1 Methodological design

![Figure 1. Methodological design](Source: Authors.)

3.1.1 Phase 1: Data collection
Data collection was executed from the Search tool on the Scopus website, where 61 publications were obtained from the choice of the following filters:

- TITLE-ABS-KEY ( teaching AND english, AND artificial AND intelligence, AND higher AND education ) AND ( LIMIT-TO ( PUBYEAR , 2022 ) OR LIMIT-TO ( PUBYEAR , 2021 ) OR LIMIT-TO ( PUBYEAR , 2020 ) OR LIMIT-TO ( PUBYEAR , 2019 ) OR LIMIT-TO ( PUBYEAR , 2018 ) OR LIMIT-TO ( PUBYEAR , 2017 ) )
- Published documents whose study variables are related to the study of English Teaching, Higher Education and Artificial Intelligence.
- No distinction by country of origin
- Without distinction in areas of knowledge.
Regardless of type of publication.

3.1.2 Phase 2: Construction of analysis material
The information collected in Scopus during the previous phase is organized and subsequently classified by graphs, figures and tables as follows:

- Co-occurrence of Words.
- Year of publication.
- Country of origin of the publication.
- Area of knowledge.
- Type of Publication.

3.1.3 Phase 3: Drafting of conclusions and outcome document
In this phase, we proceed with the analysis of the results previously yielded resulting in the determination of conclusions and, consequently, the obtaining of the final document.

4. RESULTS

4.1 Co-occurrence of words
Figure 2 shows the co-occurrence of keywords found in the publications identified in the Scopus database.

![Figure 2. Co-occurrence of words](source)

Source: Own elaboration (2023); based on data exported from Scopus.

Students, Artificial Intelligence, and Education in English, make up the three keywords with the greatest influence within the main group of research identified with the color red in Figure 2, directly related to publications that analyze the variables Higher Education Institutions and English Schools, so it is expected that the
publications identified through the execution of Phase 1 of the methodological design proposed for the development of this document, delve into the strategies that are implemented in the process of teaching a second language, based on the use of ICT and advances in Artificial Intelligence that every day represent new and better tools to ensure a successful learning of English. Teaching also represents one of the keywords most used in the publications analyzed in this article, associated with variables such as E-learning, Teaching Methods, Teaching in the Classroom, which combine the different methodologies, in the application of didactic material from the technological tools manifested in the publications based on Learning Systems, Computer-Assisted Instruction. It draws attention, the keyword Big Data, which feeds with a high volume of information, the systems that are dedicated to support the teaching of a second language, being able to process such data, in order to offer a personalized experience in the learning processes, individualizing the needs of each student through the interpretation of the most effective methodologies for each case.

4.2 Distribution of scientific production by year of publication

Figure 3 shows how scientific production is distributed according to the year of publication.

![Figure 3. Distribution of scientific production by year of publication.](image)

Source: Own elaboration (2023); based on data exported from Scopus

During the year 2022, a total of 28 scientific documents were published through high impact journals indexed in the Scopus database which are closely related to the study of teaching techniques in English language learning in higher education students, based on the contributions of Artificial Intelligence, as proposed in the article entitled “Design of a Path Analysis System for the Implementation of Online English Education based on SVM+LDA” (Niu, 2022) whose purpose was to design a system for the analysis of the implementation path of online English education, understanding that globalization itself has allowed the offers of educational
institutions to diversify their strategies. As shown in the teaching of English based on the use of technological tools the management of big data, cloud computing and artificial intelligence. According to its authors, the demand in China has grown vertiginously due to the awakening of a collective interest in handling a second or third language, in this case English, so the users of digital platforms for this purpose, has increased significantly in recent years. Within the data analyzed necessarily to fulfill their objective, the authors analyze the English learning behavior and the state of use of users of online English education, based on the model of confirmation of expectations, combined with the model of success of the information system and the theory of the relationship with the client. Build a conceptual model of the behavior of continuous use of users of online English education, concluding that such a system has some viability in terms of the academic training of Chinese students in the training of the second language.

4.3 Distribution of scientific production by country of origin. Figure 4 shows how scientific production is distributed according to the nationality of the authors.

![Distribution of scientific production by country of origin](image)

**Figure 4. Distribution of scientific production by country of origin.**

**Source:** Own elaboration (2023); based on data provided by Scopus.

China widely leads the research around English language teaching techniques applied to university students based on the usefulness of Artificial Intelligence, with a total of 41 publications in journals indexed in Scopus during the period 2017-2022. Only one Latin American country has presented scientific production around the topic mentioned above, Ecuador with a publication entitled “The impact of virtual platforms in the field of the knowledge and information society as a learning
resource” (Gonzalez-Carrión, Muñoz-Vallejo, & Sánchez-Landín, 2020) whose objective was to determine the impact of the Kahoot educational platform on students of the Institute of Languages of the National University of Loja (UNL) and how its application has improved student development. It should be noted that this methodology applied in the teaching-learning process is lowered in the game where theoretical-practical knowledge is applied in a playful environment for the student community, thus allowing to get out a little of the “mold” of traditional teaching taking advantage of the tools offered today by ICT, so that the learning of both the English language and other areas of knowledge, become more dynamic and arouse greater interest in students. Therefore, the authors recognize the Kahoot resource as a learning tool that captures the attention of students to learn by playing in a higher education context.

4.4 Distribution of scientific production by area of knowledge

Figure 5 shows the distribution of the elaboration of scientific publications from the area of knowledge through which the different research methodologies are implemented.

![Figure 5. Distribution of scientific production by area of knowledge. Source: Own elaboration (2023); based on data provided by Scopus.](image)

Computer Science was the area of knowledge with the greatest influence in the execution of research projects related to the study of teaching and learning techniques of the English language in higher education downloaded in tools provided by Artificial Intelligence, a total of 44 documents included within their
methodologies, the study from a technological perspective as shown in the article "The model architecture of AI technology in the teaching of higher professional English in the classroom" (Liu, Gong, & Liu, 2022) whose objective was to analyze mainly the establishment of an artificial intelligence technology system model in the teaching of English in higher vocational training classrooms. The authors identify a series of problems in the processing of data that feeds the information systems that make up the technological applications based on Artificial Intelligence, especially those that analyze the behavior of students within virtual platforms, for which the authors propose solutions to these drawbacks recognition of the importance of the development of the different teaching methodologies based on resources currently offered by technological advances in terms of education. The successful integration of English language teaching with the technological proposals currently offered to strengthen the generation of new knowledge is sought.

4.5 Type of publication

In the following graph, you will observe the distribution of the bibliographic finding according to the type of publication made by each of the authors found in Scopus.

The Type of Publication most frequently used by the authors identified through the search executed on the Scopus database under the criteria registered in the methodology proposed for the development of this document, define the Conference Articles, as the most frequent methodology in terms of publications, with a percentage of 49% compared to 33% of Journal Articles. In third place, Conference Reviews with 15% and Book Chapters with 1%. From this last category stands out the document entitled "Perspectives of the teaching of English in higher education institutions in a digitalized educational process" (Kovalev, 2021) whose objective was to analyze the latest trends in the digitalization and computerization of education today, which contribute to the general process of introduction of
modern technologies in education, as a process of stable global trend, which implies
an improvement in the contents, forms and approaches of learning. Therefore, the
authors manage to establish the important contribution that digital media exert on
the academic training and execution of teaching strategies within the preparation
of students in higher education, which, through online learning, manage to detach
their process of acquiring knowledge through traditional methods, taking advantage
of the multiple advantages offered by ICT today.

CONCLUSIONS
Thanks to the bibliometric analysis applied to the search results in the Scopus
database, where the works published in high-impact journals related to the study of
English Language Teaching and Learning Techniques in higher education students
during the period 2017-2022 are contemplated, it was obtained that China was the
country with the highest number of records in said platform with a total of 41
published documents, being the leading country in research related to the topic
mentioned above, followed by Russia with only two publications. Ecuador was the
only Latin American country present on the list with a document that explains the
importance of the application of digital strategies in the training of university
students in search of the necessary tools to have the mastery of a second language,
in this case, English. On the other hand, the area of knowledge with the greatest
influence in the execution of the different research methodologies carried out by
the authors related here, correspond to those derived from Computer Science, thus
explaining the nature of the variables intervened, which led the line of research
related to innovation, Information and Communication Technologies (ICT), Artificial
Intelligence and BigData analysis as one of the most important and determining
sources of information when feeding educational systems with the behavior of
students within the educational applications designed with the purpose of supporting
face-to-face methodologies in higher education. It has been determined that the
type of publication most frequently used within the scientific community referenced
in this document was the Conference Article, which represented 49% of the total
publications identified for further analysis. From the above it was possible to infer
that the conferences related to the treatment of the Teaching and Learning
Techniques of the English Language in students of higher education, resulted in 30
of the 61 publications were carried out thanks to the presentation of the research
findings in these academic spaces. From the above, it is worth noting that the
authors agree on the importance of integrating face-to-face and virtual models in
the teaching of English, in order to expand educational coverage and of course target
all the needs of students by providing the necessary tools for their efficient
performance in the labor market. Finally, it is vital to recognize the contribution of
reviews such as the one presented in the document, since from these results it is
expected to encourage the scientific community to generate new knowledge around
the use of Artificial Intelligence as a strategy in the process of learning a second
language in university students and the generation of awareness as to what it implies for work performance, have the command of the English language today.

REFERENCES


[19] Li, R. (2020). Based on the artificial intelligence technology in higher vocational english major students after-school tutoring system design research doi:10.1007/978-3-030-43309-3_80 Retrieved from www.scopus.com


