Artificial Intelligence as a Support for Arabic Language Learning in Higher Education with VOSviewer Analysis

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Abstract— **The world is increasingly showing the progress of human resources in the field of science and technology, and the development of knowledge about this technology also continues to accelerate rapidly with the discovery of many features that have sprung up to be utilized according to human technological needs. Especially in the field of education, the development of technology-based features is also increasing, supported by technology-based learning systems. Newly emerging learning systems, such as an online machine-based intelligence apk that performs class teaching movements according to the connection provided by humans, this effort is a type of association in the interaction between robots and humans with correspondences that are linked between signals and movements. In this case, the robot provides an educational learning system with a discourse recognition process. The use of robots in learning Arabic in higher education also shows how an educational institution designs the latest technology-based learning system with the use of online robots to assist the learning process in the classroom. This online robot learning system is closely related to the use of supporting wireless network cables in the online robot association; therefore, a bibliometric analysis will be carried out on the use of artificial intelligence in supporting Arabic language learning in higher education with the help of VOSviewer. The results of the VOSviewer overview will provide conclusions about the extent to which artificial intelligence effectively supports Arabic language learning in higher education.**

Keywords— **Arabic Language, Artificial Intelligence, VOSviewer Analysis**

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I. INTRODUCTION

Education is a basic need for every individual human being (Dewi, 2020; Elihami & Syahid, 2018; Hakim, 2020), this is a form of the essence of developing knowledge as an advantage of life for humans, periodic knowledge continues to grow along with the passage of time (Latifah et al., 2020; Maulidiyah, 2020; Widiyono, 2020), from a learning system based only on the lecture method in the early 18th century, increasingly developing educational progress with the help of technology, especially for the world of education there is also technological direction in supporting students' knowledge (- Lie et al., 2020; Abbasi et al., 2020; Al Mamun et al., 2021), with the foundation as a path that must be taken to recognize a series of learning processes, for that many approaches have been taken to solve how the learning process is increasing (Albarrak et al., 2021; Alshawish et al., 2021; Alvarez, 2023), improving the quality of learning will reflect how a nation has children with effective knowledge integrity.

Technology is also a form of direction for the development of science based on science and technology (Mitek, 2022; Qays et al., 2023; Ramadhani, 2018), it is undeniable that various educational institutions will not be able to escape their relationship with technology (Andika et al., 2023; Roth et al., 2020; Tai, 2020), it is like a fuse in an effort to improve the quality of learning that is nuanced over progress, it is clear that efforts to empower technology in educational institutions really help improve the quality of learning more effectively, especially in world education institutions, this can be evidence that Indonesia is able to show the nation's children who are broad-minded with high technological knowledge. of course this supports the nation's movement in the advancement of world education (Aghabalaei et al., 2023; Asha et al., 2023; Mourtzis et al., 2022). Not only educational institutions, the movement of socio-cultural systems and other environments in all aspects also really needs the role of technology in the journey of life. This is a form of high quality nation, especially in the soaring movement of science and technology.

The use of this technology has increased sharply when viewed from the use of the last few years. Where all regions really need the use of technology in the continuity of learning (Banja et al., 2022; Nagy et al., 2022; Thurzo et al., 2022), of course this is strongly associated with the role of the share of disease outbreaks that attack the world (Angelini & Shah, 2021; Bélisle-Pipon et al., 2021; N. Liu et al., 2021). With this incident, this is the culmination of many individuals who are technologists who come up with learning designs that want to be conveyed and in order to create a learning process that remains effective, previously this overwhelmed guardians, educators and initial students (Ahuja & Nair, 2021; Ara Shaikh et al., 2021; Theodoraki et al., 2023). Because the development is very sharp without any prior introduction to the design features that exist in technology to be utilized in the continuity of learning. Technology-based learning systems are also felt by Higher Education institutions, in its continuity, Higher Education is much more familiar with this kind of learning system, but in its time it has not known significant development, this is also felt in Arabic language learning (Alam et al., 2022; Alanazi et al., 2022; Cervantes et al., 2020), this learning really requires in-depth understanding and study to achieve effective results from the learning process.

Arabic language learning is an example of learning that is fun to learn, understanding the material is very characteristic of its own (Achar et al., 2018; Elhoshi et al., 2023; Talaviya, 2020). For this reason, in its continuity, this learning has also begun to be developed in line with the use of increasingly sophisticated technology (Baldos et al., 2019; Jiang et al., 2023; Koçak, 2019), with the use of Arabic language learning technology will show if this learning is able to compete in technological developments, in its design many features are found that can support Arabic language learning in achieving its learning existence based on technology (Ahn & Lee, 2021; Aljizawi et al., 2021; Humaisi et al., 2019), it is undeniable that the features that support this are still equipped with a deep understanding of the material, vocabulary, reading, and exercises, as well as learning videos, one of the technological fractions that support the development of learning systems is this Artificialt Intelligent, this application is a kind of artificial intelligence robot that will help increase students' knowledge in learning (Abduljabbar, 2019; Bakytbekov et al., 2023; De Vries et al., 2023). This media will help

user adaptation in improving the quality of learning by humans.

Basically, this use has been used in various aspects that require the help of this intelligence robot in honing the ability of memory, thinking, and quality in testing the ability of its users (Benjamens, 2020; ERKOÇ et al., 2023; Lin & Wu, 2021). Its use is in accordance with the essence of the purpose of this media in creation, of course if the use of learning media will clearly show that educational institutions are capable of utilizing science and technology for the advancement of the nation's educational knowledge (Aldhahi et al., 2021; Amoussou et al., 2023; Bakytbekov et al., 2023). The use of special programmed media with the help of remotes and as such in regulating the mindset and knowledge that will be channeled. For Arabic language learning itself, of course, the use of Artificial Intelligence is very beneficial, this is of course seen from how the continuity of learning runs, which shows a high increase in educational effectiveness (Horie, 2019; Hu et al., 2020; May, 2021). in the production of learning media based on brain intelligence, of course, it also requires an important role for computer networks to organize navigation systems in the continuity of an efficient teaching and learning process.

To analyze this in depth, a review will be carried out with a literature review in analyzing Artificial Intelligence in supporting Arabic language learning in Higher Education, the effectiveness of using this media which is felt to provide a learning process that has a high advantage. and in the analysis will be able to find the impacts found in the use of Artificial Intelligence as a means of supporting learning (T. Liu et al., 2023; Polas et al., 2022). For this reason, further study by running a bibliometric analysis in solving this media study in its integrity to improve the quality of education. The results of the analysis findings will be explained in detail in the delivery of the discussion on the analysis of this Artificial Intelligence in supporting interactive learning To display the results of this bibliometric analysis overview (Akbari et al., 2023; Humaisi et al., 2019; Kinghorn et al., 2019), researchers will move the scientific data collected in the form of RIS data which will be transferred to the VOSviewer software.

VOSviewer aims to show how the picture of the results of the review of previous scientific data that has been relevant in research studies on the use of Artificial Intelligence in supporting Arabic language learning in Higher Education. in the results of the VOSviewer picture, various clusters will be found which determine the groups of scientific data that are relevant in the use of Artificial Intelligence (De Blaquière et al., 2019; Farooq et al., 2020), in this study the researchers focused more on describing the results of relevant data in the research cluster how the role of Artificial Intelligence in supporting Arabic language learning in Higher Education is carried out effectively. In the results of the analysis and data collection in VOSviewer, a validation model will also be presented which provides a detailed explanation in reviewing the access to the relationship of each cluster in its utilization in various objects.

To find out the results of the research review carried out, the researcher has entered the analysis data with a scientific approach, the data is obtained from various searches for scientific articles on Scopus, Dimension, and ScienceDirect about Artificial Intelligence supporting Arabic language learning with VOSviewer bibliometric analysis with detailed discussion results, researchers chose to analyze the findings of this study with bibliometric analysis with the help of VOSviewer nothing but to facilitate analysis and can facilitate assessment in various factors about the impact of the use of Artificial Intelligence either positive or negative. Then from that it will be concluded how the findings will be about Artificial Intelligence supporting Arabic language learning in Higher Education, as well as showing the progress of the nation's education based on modern technology.

II. METHODE

In obtaining research results on the themes studied, the researchers used the research methods of literature analysis studies and bibliometric analysis (Arruda et al., 2022; Cascajares et al., 2021). For the literature analysis study, researchers conducted a review of scientific data that was first relevant in analyzing the use of Artificial Intelligence to help support Arabic language learning in Higher Education. the results of the analysis will be processed in the database that has been referred to national and international research that is traced on the Scopus, Dimension, and

Science Diretc platforms. As for the review with bibliometric analysis, researchers also use a review of databases indexed by Scopus, Dimension, and Science Direct, these data have been summarized in research that is sure to be relevant because it has national and international titles. Dedicated writing is summarized in international writing with the use of accurate research references (Djeki et al., 2022; Jia et al., 2022). In Scopus, data review can only be input with 200 data using free fire, while Dimension and Science Direct can input scientific data indexed nationally and internationally around 1500 scientific databases or more.

The assessment of scientific data processing will be transferred in the form of a RIS database for requirements in inputting processed data for bibliometric analysis in the VOSviewer software (Y. Li & Zhou, 2021; Rizky Jumansyah, 2022). Data processing that has been mapped will be able to see how the network and density visualization. This is with the aim of making it easier for researchers to draw conclusions from direct bibliometric analysis, as well as providing an accurate explanatory picture to be summarized later in the results and discussion (Sheng et al., 2023; Yang et al., 2023). In addition, the mapping results will be grouped in the form of relevant clusters and accurate data presentation about the researcher's objectives in analyzing how Artificial Intelligence helps learning Arabic in Higher Education. the results of the analysis data will also be summarized in the form of mapping nodes in the form of horizontal, vertical, and circular (Roth et al., 2020; Soegoto et al., 2021). The use of Artifialct Intelligence will greatly impact the advancement of technology, especially in educational institutions.

In revealing contributions about the review of research conducted in order to obtain relevant and accurate dabase results. So the researchers identified the stability of the use of Artificial Intelligence in supporting Arabic language learning in Higher Education (Dewi, 2020; Hakim, 2020; Rahayu, 2020). This also considers how effective the continuity of learning is with the use of Artificial Intelligence, namely a learning system based on artificial intelligence technology that is able to explore new learning systems with the help of internet wireless networks, besides that it also reveals the determinants of Artificial Intelligence that have an effective contribution in supporting learning which will be mapped using VOSviewer software (Allam, 2019; M. Li et al., 2023; Roth et al., 2020), the validation of data collection is input from accurate relevant data and published in the last 5 years to conduct a bibliometric analysis study on VOSviewer and these results have been summarized in the discussion of VOSviewer bibliometric analysis.

III. Result and Discussion

Research conducted to analyze bibliometric about the use of Artificial Intelligence in supporting Arabic language learning in Higher Education, in this case before reviewing further, researchers first provide insight into this media. This media is a kind of media that provides artificial intelligence tests in the form of online robots. This media will direct both parties in teaching will be directed to the theory of computer science to solve cognitive problems that are closely related to human intelligence. In this case, learning with this intelligence media starts with the introduction of problems and also teaching system patterns. The abbreviation in this media is more familiar with the name AI (Artificial Intelligence) which strongly connotes robotics or futuristic scenes. The learning system using robotics is very concrete with scientific robot learning fiction. The learning system is based on modern technology that matches the efficiency with statistical computing of learning by using the movements of artificial disciplines in the direction of interactive learning.

Learning by using Artificial Intelligent is very beneficial for both parties who teach, for educators this is a spark and an increase in the quality of the quality of education, while for students the media with this brain intelligence system certainly provides knowledge movements with the use of modern technology-based robots to students, in addition to increasing the quality of knowledge is also very real with direction and guidance from mere robotives. Some educational institutions in running a learning system based on artificial brain intelligence learning media can also be conditional on the use of E-Learning or deep learning. Knowledge materials will be exerted and processed in the use of AI to review the quality of robotics power in delivering teaching materials that have been connected. This is supported by mechanical

turk with dynamic movement through kinesis streams. In Artificialt Intelligent, the concept of wireless internet is very applicable, because the teaching system with this technology needs wifi access that connects robotics with students in channeling knowledge. This robotics-based learning is also equipped with material delivery facilities, videos, and competency tests.

The use of robotics in the teaching system is also felt by Arabic language learning in universities in recent years, this is seen by how the linkage of artificial intelligence is able to improve the teaching system based on technology and instill integrative knowledge values, of course the learning process using robotics in Arabic language learning will give its own impression as a new value in the existence of interactive teaching quality with the help of artificial intelligence robots. For this reason, this research aims to analyze how the views of previous studies in assessing Artificial Intelligence are able to overhaul the robotics-based learning system designed with artificial intelligence in supporting the development of students' knowledge in learning that is understood. The results of bibliometric analysis of Artificial Intelligence in supporting Arabic language learning have been summarized in the clusters obtained in the mapping results using VOSviewer software.

The development of knowledge summarized in the robotics systematic shows how the program processing is done by experts to be able to cover the needs of teaching materials needed in related learning, in learning Arabic in Higher Education for learning programming that is needed do accommodation in the form of material guides, supporting teaching materials, Arabic vocabulary, Qiraah, learning videos and competency tests that have been summarized in the robotics systematic on the artificial intelligence produced. The use of this media as a learning support gives its own impression in accordance with the rapid development of the teaching world which is very competent and has an eran link with technology. The teaching system using Artificial Intelligent for students really has its own superior value, this is because the previous learning system at the Higher Education institution level already has a relationship with technology. Of course, if the use of AI is widely developed, it will improve the quality of effective student abilities. For students, the use of this media helps them to develop designs for more productive use of technology.

Learning using AI is able to show the quality of machine-assisted learning algorithms and is filled with supporting feature designs that are science and technology oriented. Learning design can be qualified in the order of data processing and prediction design that is distributed before starting the use of the application. Therefore, the study of the analysis found after inputting data from searching scientific databases from Scopus, Dimension, and Sciendirect to examine in-depth analysis of the review of Artificial Intelligence in supporting the Arabic learning system in Higher Education. The results of the research described through mapping with VOSviewer software found a study of literature and bibliometric analysis, in the research that took place the database from Scopus was reviewed from the collection of data surveys of around 250 scientific databases relevant to journals published in international journals in the last 5 years, for searches with Dimension data entry 2000 scientific databases in the published period in the last 5 years as well and in science direct a mapping analysis was carried out with data entry 1500 relevant and concrete scientific databases published in international journals. Each of these scientific databases is transferred in the form of a RIS document which is a concrete requirement for inputting bibliometric analysis data on the VOSviewer software. The results of image mapping with VOSviewer will be explained as follows:

a. Scopus-indexed RIS Data Mapping Results

Research that has been conducted by researchers provides very significant bibliometric analysis valifdation results on the use of Artificial Intelligence based on artificial intelligence robots that are accommodated to greatly support the learning system in Higher Education. this can be seen from the results of the cluster image which is able to imply the meaning if the teaching system supported by Artificial Intelligence is very capable of providing significant changes to the learning process. Apart from that, it is also able to show how the existence of education in recent years has jumped up drastically in the learning and teaching system. From the Scopus data test processing with the analysis test capacity of 250 scientific data published in international journals, the results of

the ris data mapping in the VOSviewer software below are obtained.

Figure 1 Data search related to Artificial Intelligence research on the Scopus Database

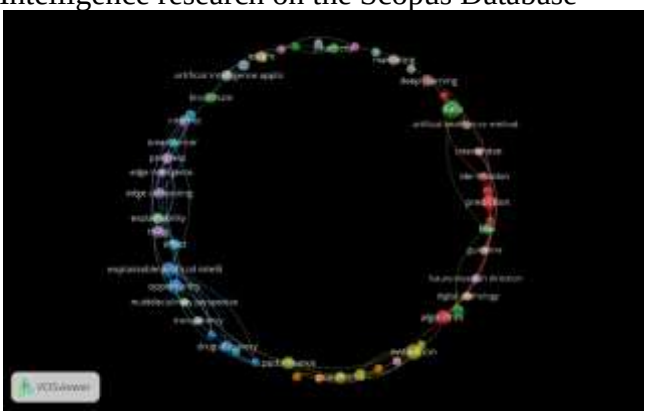

Fig 1. Results of RIS data mapping with Scopus data analysis

Figure 1 Alt Text. This data was taken from the Scopus database using the publish or perish application for the last 5 years and analyzed to find out how many people are researching Artificial Intelligence which has been indexed by Scopus

The results of the mapping image obtained on RIS data through data searches in Scopus to be able to assess bibliometric analysis of the use of Artificial Intelligence in an effort to support the improvement of the quality of learning, especially in Arabic language learning in Higher Education. the picture of the results of this mapping is obtained by testing the results of research summarized in 250 scientific data published in international journals. Then the RIS data is transferred to the VOSviewer software to facilitate bibliometric analysis of Artificialt in supporting the quality of learning, seen from the discovery of clusters divided into 54 clusters that are closely related to all aspects, for education has a cluster group that is widely filled, because it is known that the learning system at the educational world level has a lot to do with the use of Artificialt Intelligence.

The results of the review for Arabic language learning are also many who use this Artificial Intelligence media as a learning support medium, this can be seen from the various existence presented by this artificial robot intelligence in covering data processing that is transferred to be channeled back to students, of course it is clear that this will support the teaching system to be of high quality with the basis of education that is closely related to modern technological advances. The conclusion of the analysis review with Scopus also states that the use of artificial robot intelligence is able to become a level power and benchmark for the progress of educational institutions in all directions in the competition for science and technology in the world of education in the modern era.

Mapping Results of RIS Data database in Dimension

The results of the second mapping validation in this study were carried out by inputting data with the scientific data index on Dimension, the data inputted on Dimension can be taken by searching in the last few years, in this study the researcher decided to take scientific data published in international journals as many as 2300 scientific papers with discussions about Artificial Intelligence. The results of the data obtained will be transferred in the form of RIS data which will also be distributed to the VOSviewer software, this aims to be able to analyze bibliometric about how the use of Artificial Intelligence in educational institutions in supporting the learning process, especially in Arabic language learning. The processed data results obtained in the RIS Dimension data will be explained by the researcher about several clusters that are grouped for its use as an artificial intelligence robot, the mapping on VOSviewer from the processed data is attached below.

Figure 2 Data search related to Artificial Intelligence research on the Dimension Database

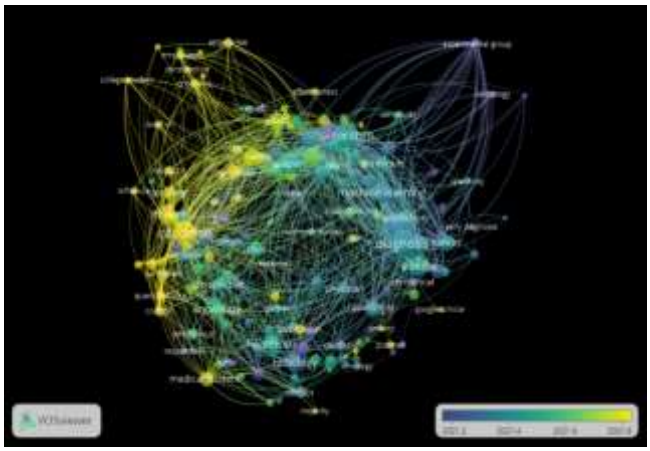

Fig 2. Mapping results with RIS data on Dimension

Figure 2 Alt Text. This data is taken from the Dimension database by downloading the RIS file on the website, the files taken are from the last 5

years and analyzed to find out how many people are researching Artificial Intelligence.

The picture above is the result of mapping RIS data using data processing inputted from Dimension. The purpose of this input is still the same as the previous index data, which is to find out how Artificial Intelligence supports development in modern technology-based science. This data is obtained by searching the Dimension index by inputting data that is converted into RIS data and transferred to VOSviewer software to get mapping results with bibliometric analysis. After mapping, researchers get the results of bibliometric analysis. The results of the picture explain that there is a significant influence on the use of Artificial Intelligence in the learning process in various aspects, educational institutions have full control of the use of this artificial intelligence robot in an effort to improve the quality of learning quality.

The results of the picture also explain that there are 49 clusters that break down the use of Artificial Intelligence in various aspects, and this breakdown is done according to the use of various fields in honing the intelligence capabilities of individual knowledge by using artificial intelligence robots. This use has been combined by the global system, for the use of Artificial Intelligence holds 75% of the new advantages in the world of education, the lack of percentage of Artificial Intelligence in Indonesian educational institutions is because Indonesia is still lacking the procurement of this media as a teaching medium in each educational institution, other than that the relevance of use has been declared effective as a way to support more effective learning and based on modern technology.

The images produced in the mapping also provide a statement that the scope of use of this artificial brain intelligence with the help of this robot form has a significant user turnover, this is seen in the image networks interconnected or meet each other at the starting point of Artificial Intelligence. Of course this proves that the learning network with the use of artificial robot intelligence is very effective in helping both parties in the teaching process to be more productive and capture knowledge with a quick release, the contribution of this use is also inseparable from the role of the internet wireless network or wifi which is the main travel point for the running of artificial robots to provide effective knowledge insights in line with the use of internet-based computer technology. In Arabic language learning, this media also has a significant contrast in supporting the transfer of technology-based material that will be carried out in the era of the onslaught of advances in science and technology as a support for the learning system in the modern global era.

b. RIS Data Mapping Results using the Science direct database

Not much different from Dimension, Science direct also provides a mapping picture of the bibliometric analysis carried out, in referring to the mapping results, Science direct data input is also carried out which is moved into RIS data and then entered into the VOSviewer software to get the intended bibliometric analysis results. Data input is taken as many as 2500 scientific databases referenced from international journals that can be guaranteed to be accurate in their relevance to discuss the use of Artificial Intelligence as a means of supporting learning in Higher Education. the results obtained also show a great influence in the extability of the advantages of teaching media based on modern technology with robotic aspects of artificial intelligence. The database results that have been input into VOSviewer provide an overview of the clusters related to the intended research, the researcher has attached the mapping description below:

Figure 3 Data search related to Artificial Intelligence research in the Science Direct Database

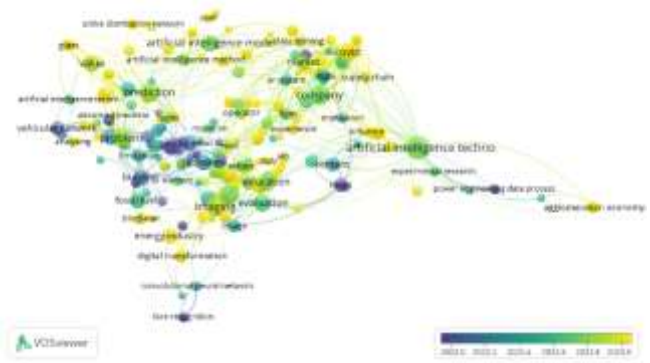

Fig 3. Results of mapping RIS data with science direct database

Figure 3 Alt Text. This data is taken from the Science Direct database by downloading the RIS file, the data is taken from 100 articles in the last 5

years and analyzed to find out how many people are researching Artificial Intelligence.

This is the result of mapping produced by validating scientific data collection taken from Science direct data which is then transferred into RIS data to make it easier to index bibliometric analysis using VOSviewer software, this data entry is carried out to be able to draw analytical conclusions on this third platform about how the use of Artificial Intelligence plays a role in learning media systems in several educational institutions, especially at the Higher Education level. Data validation is inputted from the discovery of the last 5 years of analysis data that has been confirmed to be accurate educational relevance, in terms of learning systems based on artificial intelligence robots, not much different from other learning, Arabic language learning in Higher Education has also begun to apply the use of artificial intelligence robots in the development of learning systems based on modern technology.

The findings of the data results on Science direct explain if Artificial Intelligence is very accurate with the learning system in various aspects of knowledge, the clusters obtained in terms of bibliometric analysis research are 60 clusters, all clusters are teaching systems that are summarized in various aspects that contribute to the use of modern technology in learning. The picture also provides guidance that periodic teaching from year to year has a close continuity that cannot be separated from technology, this is also a form of progress in the human resources of a nation if it is able to interact with the development of learning, this is valued because quality learning is considered to have integrity and insight if it is able to interact with the increasing progress of science and technology.

The results of the review also explain that knowledge has an important role because the education system if the cluster group has 77% of relevant research discusses how the assessment found by previous researchers on Artificial Intelligence in the progress of world education, especially in Indonesia, one of which is teaching that has begun to apply the use of artificial intelligence robots as a supporting medium in learning in several educational institutions in Higher Education gets an effective value to continue to be used as a supporting medium for modern technology-based learning. Also as a manifestation of a nation in showing its educational progress in the international education assessment arena.

With the results of the analysis that has been obtained, and also has reviewed the study data traced by searching data in the Scopus index and Dimension database and Sciencedirect database. The data test is made sure to be relevant and accurate because it is taken from the results of the validation of international journals on the use of Artificial Intelligence in supporting learning in Higher Education, the study is analyzed more deeply because it looks at how the contribution of its use also affects the learning of Arabic in Higher Education level institutions. the results of the analysis explain that the use of Artificial Intelligence is accurate with the world of learning, this is a form of integrity of a nation in competing with the advancement of science and technology in the world of education. And for Indonesia, the use of Artificial Intelligence has entered a percentage of use of more than 70% in various aspects of the intended knowledge, of course this makes a picture if Indonesia is able to compete in technology in the international education arena.

IV. CONCLUSIONS

The study of bibliometric analysis in Artificial Intelligence research in supporting learning in Higher Education is considered to have a very large and significant advantage, this is seen from the results of mapping with the findings of accurate clusters stating that this media greatly contributes to advancing world education based on modern technology computer networks. This analysis is obtained from inputting RIS data taken from Scopus 250, Dimension 2300, Science direct 2500 scientific data, this data input is taken from the acquisition of relevant research published in the last 5 years. And moved into the VOSviewer software to review bibliometric analysis, this aims to get the results of image mapping in drawing the essence of how the relevance of its use in the field of education, especially in the learning process in Higher Education. these results have been summarized in the form of the discussion above, with an assessment if Artificial Intelligence is very relevant as a means of supporting learning, especially at the Higher Education level, and provides a conclusion if this artificial intelligence

robot media is able to become a form of educational competition in the international arena and as evidence of mastering modern technology-based education according to the development of advances in science and technology.

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