



Inquiry research trends through bibliometric analysis (2020-2023)

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ARTICLE INFO	ABSTRACT
Article history Received: 12 June 2023 Revised: 15 August 2023 Accepted: 01 September 2023	This article aims to analyze the trend of Inquiry research through bibliometrics in the Google scholar database from 2020 to 2023. The article consists of a total of 993 articles, then sorted into 788 suitable articles and analyzed. The method used in this research is article analysis using bibliometrics with the following stages: keyword search, initial search results, refining search results, compiling initial data, and data analysis. The results show that publications in scientific articles regarding Inquiry vary every year. Then, the description in Education research trends produces seven clusters, namely science process skills, science teacher, argument driven inquiry, framework, experience, critical thinking skills, and senior high school. The findings of this study are expected to help other researchers who are interested in studying and researching related to Inquiry research trends and recommend directions for further research
Keywords: Bibliometrics Education Inquiry Science	

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INTRODUCTION

Inquiry learning is a learning activity that maximally involves all students' abilities to seek and investigate something (objects, people, or events) systematically, critically, logically, analytically so that they can formulate their own findings with confidence (Calleja et al., 2023; Ruzaman, 2020., Novitasari & Iqbal, 2021). The success of the learning process is inseparable from the teacher's ability to develop learning models that are oriented towards increasing the intensity of effective student involvement in the learning process. The development of the right learning model basically aims to create learning conditions that allow students to learn actively and pleasantly so that students can achieve optimal learning outcomes and achievements. To be able to develop effective learning models, every teacher must have adequate knowledge regarding the concepts and ways of implementing these models in the learning process. Effective learning models are related to the level of teacher understanding of the development and conditions of students in the classroom (Kalogeropoulos et al., 2021; Kinsey & Moore, 2015).

Bibliometrics is a branch of information science commonly used in the library field to find out in detail the year of publication, citations, and images and graphics in the text of the article (Akbari et al., 2020; Bahoo, 2020; Francis et al., 2021). Bibliometrics is widely used to study the interaction between science and technology; investigate the development of new knowledge in a particular field; and produce mapping of fields of science (Bretas & Alon, 2021; Hudha et al., 2020; Li et al., 2022). In looking at Inquiry research trends, bibliometric analysis is important (Agustina, 2022; Ridzuan et al., 2019; Walsh et al., 2018). Bibliometric analysis can help to see the number and quality of scientific publications on Inquiry, the authors most involved in this research, as well as the research trends that have developed in recent years (Nani Rahayu & Sobari, 2021).

Bibliometric analysis of Inquiry research trends provides an appropriate method to analyze the development of Inquiry research (Aparicio et al., 2023; Fox et al., 2021). Bibliometric indicators, including number of citations, source documents, country distribution, top authors of inquiry type and publication type have been frequently used to analyze trends (Kamarrudin, 2022; Mainwaring et al., 2020; Rejeb et al., 2022). Based on the results of a bibliometric analysis of inquiry research articles from several countries, information was obtained that there were several research trends in the inquiry field, for example the use of technology in the inquiry approach, such as the use of computer simulations, interactive software, and online media to increase student involvement in the scientific inquiry process. In addition, research on project-based inquiry was also found, in which this study observed the use of inquiry-based projects where students engage in in-depth and ongoing investigations about certain topics, enabling them to develop critical thinking, collaborative, and problem-solving skills. Teacher professional development in inquiry has also become the focus of research in several countries. This study focuses on professional development programs for teachers, which aim to improve understanding and implementation of the inquiry approach in science learning. This research may involve training, workshops, and mentoring. In addition, there is also a research focus on Inquiry outside the classroom. This research examines the conduct of scientific inquiry outside the classroom environment, such as in the context of field expeditions, science museums, or collaboration with research institutes. The latter is the focus of research on the evaluation and measurement of inquiry results. This research focuses on developing evaluation instruments to measure students' progress in critical thinking skills, problem solving, and content mastery through an inquiry approach.

The purpose of this study is to analyze Inquiry research trends in the last 4 years (2020-2023) to assist educational research. The focus of this research is to determine the trend of Inquiry research during 2020-2023. This research was conducted to answer questions related to the number of Inquiry research each year, ranking of article authors based on the highest number of citations, the number of articles by inquiry type, the distribution of Inquiry publications, the pattern of distribution of research papers based on scientific fields, and the results of visualization of research trends.

METHODS

Research Design

The research followed the bibliometric study guidelines. This research was conducted by utilizing databases derived from Google Scholar, in the form of journals and conference proceedings. This research began with an online search using the Publish or Perish (PoP) application from May 22 -

June 5, 2023. Researchers conducted an online search for articles by entering the keywords "Inquiry, science" from 2020 to 2023.

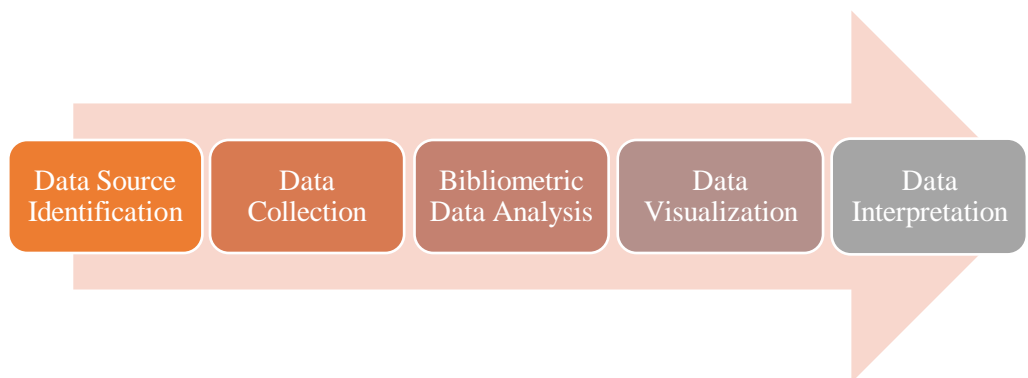


Figure 1. Steps in conducting bibliometric analysis

Data searches were conducted using the Publish or Perish (PoP) application. There are 788 documents that meet the search criteria from 993 documents throughout 2020-2023. The data that has been collected is then stored in the form (ris). Furthermore, the data that has been obtained is then processed in various programs for bibliometric and network analysis: Microsoft Excel and VoSViewer (Nurfauzan & Faizatunnisa, 2021). VoSViewer software was used to determine the research trends on Inquiry. Investigations were conducted to analyze research trends that included the profile of Inquiry publications, the distribution of Inquiry publications based on research locations, the distribution of Inquiry research papers in subject categories, the distribution pattern of Inquiry research papers based on the research methods used, and Inquiry research trends during 2020-2023. The co-occurrence of keywords was performed with VOSviewer, which uses the Visualization of Similarities (VOS) algorithm as an alternative to multidimensional scaling (Aribowo, 2019)

RESULTS AND DISCUSSION

Number of Inquiry research during 2020-2023

Publications devoted to Higher Order Thinking Skills research throughout 2020-2023 are shown in Figure 2. Inquiry research throughout 2020-2023 varied in number. The complete results of the number of Inquiry articles during 2020-2023 can be seen in Figure 2.

Based on Figure 2, it can be seen that if analyzed every year, it turns out that the number of Inquiry research varies and the highest number of inquiry research is in 2021, totaling 260 articles. This shows that inquiry research is still an interesting topic to research, both in terms of model implementation, measured variables, or research methods used in research.

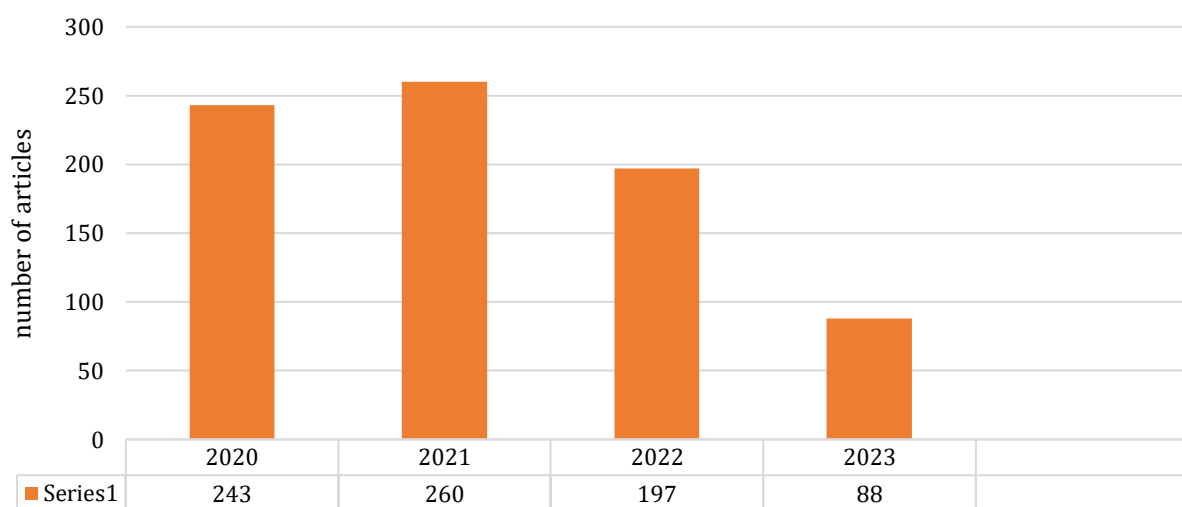


Figure 2. Number of Inquiry research during 2020-2023

Ranking 10 authors of Inquiry articles based on the number of citations

Table 1.
Ranking of Inquiry Article Authors Based on Number of Citations

Author	Research Aims	Citation
A Aditomo, E Klieme	Investigate the forms of inquiry-based science instruction and their correlation with learning outcomes, specifically comparing these relationships across high-performing and low-performing education systems	93
A Sutiani	Implement an inquiry learning model integrated with science literacy to enhance students' critical thinking skills	77
S Uğur, E Duygu, ÖF ŞEN, T Kirindi	Investigate the impact of STEM education on the development of scientific process skills and STEM awareness within a simulation-based inquiry learning environment	60
BS Palupi, S Subiyantoro	Assess the effectiveness of Guided Inquiry Learning (GIL) and Problem-Based Learning (PBL) in improving explanatory writing skills	59
P Kalogeropoulos, A Roche, J Russo, S Vats	Gain insights into the experience of learning mathematics from home during the COVID-19 pandemic, particularly focusing on the perspectives from two primary schools that emphasize inquiry-based learning	55
J Vartiainen, K Kumpulainen	Explore the manifestations of scientific play within early science inquiry contexts	50
E Johnson, C Andrews-Larson, K Keene	Investigate the relationship between inquiry-based learning and gender inequity within the undergraduate mathematics classroom	50
R Sari, S Sumarmi, I Astina, D Utomo	Enhance students' critical thinking skills and learning motivation using an inquiry-based mind mapping approach	47
CT Forbes, K Neumann	Analyze the patterns of inquiry-based science instruction and their relationship with student science achievement based on data from the PISA 2015 assessment	46
J Bleazby	Explore how philosophy in schools, aligned with a Deweyian perspective, fosters moral understanding, moral inquiry, and moral habits as outlined in Australia's Ethical Understanding curriculum	44

Based on Table 1, it can be seen that the most citations of inquiry research with the highest number of citations of 93 are on behalf of A Aditomo, E Klieme, with the title of the article "Forms of inquiry-based science instruction and their relations with learning outcomes: Evidence from high and low-performing education systems". In addition, the most citations are also obtained by articles that examine the implementation of inquiry models, the effects of inquiry implementation on student learning outcomes in biology, physics, chemistry or mathematics subjects.

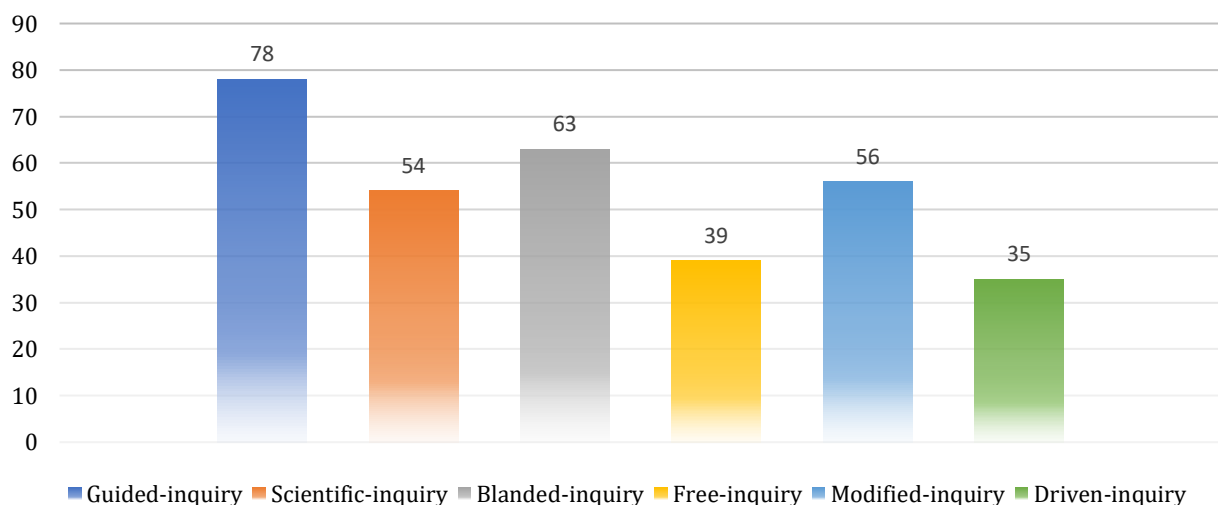


Figure 3. Number of articles by Inquiry Type

Figure 3 shows the number of articles by inquiry type from the distribution of manuscripts during 2020-2023. Based on the figure, it can be seen that the types of inquiry found from the journal review include guided-inquiry, scientific-inquiry, blended-inquiry, free-inquiry, modified inquiry and driven-inquiry. The largest distribution of articles contains guided-inquiry. In the implementation of various types/types of inquiry, there are several things that become additional information for researchers, namely whatever type of inquiry used by researchers all lead to the same thing, namely training students to be able to find themselves in learning. Through this inquiry, students are trained to search and investigate something (objects, people, or events) systematically, critically, logically, analytically so that they can formulate their own findings with confidence.

Distribution of Inquiry Publication Manuscripts Based on the Aspects Studied

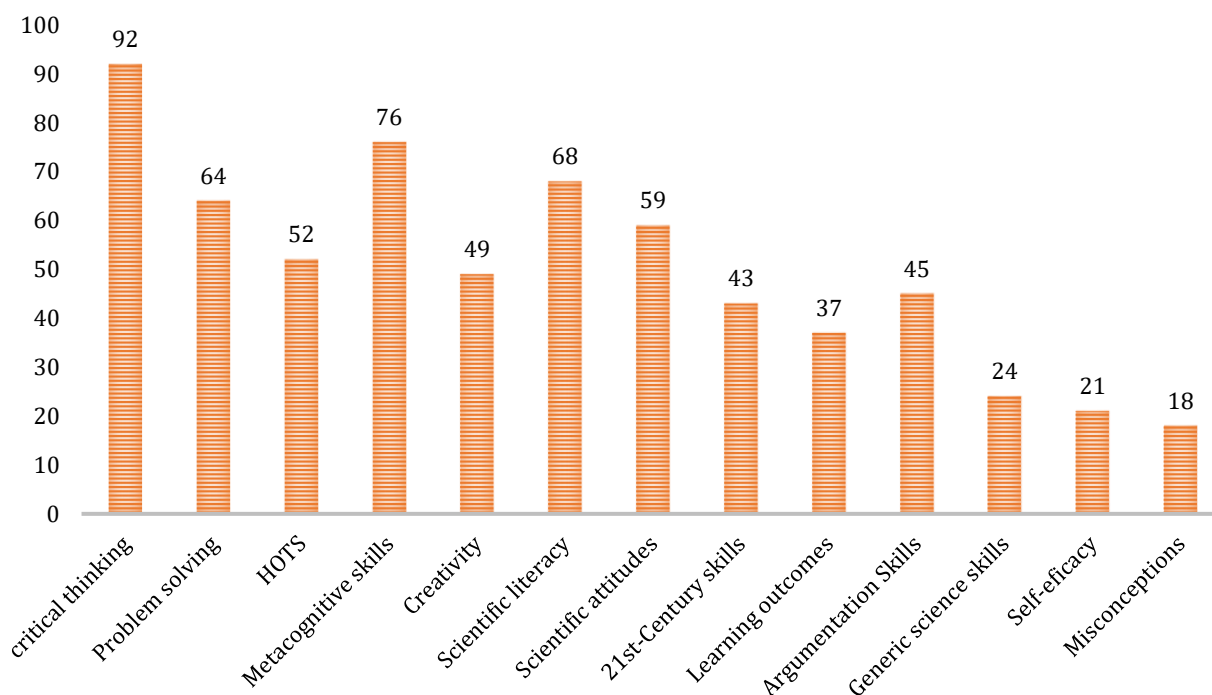


Figure 4. Number of articles according to the Aspects Examined

Figure 4 shows the number of articles according to the aspects studied from the distribution of manuscripts during 2020-2023. Based on the figure, it can be seen that the aspects studied in inquiry research are very diverse, including critical thinking, problem solving, HOTS, metacognitive skills, creativity, scientific literacy, 21st-century skills, learning outcomes, argumentation skills, generic science skills, self-efficacy, and misconceptions. Although there are articles that specifically discuss 21st century skills, most of the aspects studied lead to 21st century skills. This shows that inquiry has characteristics that are very suitable to be applied in training 21st century skills in students.

Distribution of Inquiry Publication Manuscripts Based on Research Location

Based on the distribution of Inquiry publication manuscripts, it appears that the location of research on Inquiry varies, and is dominated by Indonesia by 16%. The other 84% are conducted by researchers from Australia, America, Malaysia, Saudi Arabia etc.

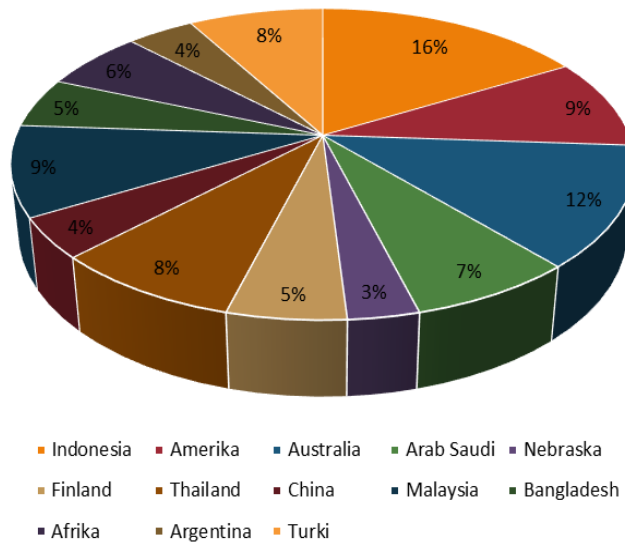


Figure 5. Percentage of total manuscript articles based on research location 2020-2023

The 5 countries with the highest number of Inquiry papers based on Figure 4 are Indonesia, Australia, America, Malaysia, and Turkey. This shows that the inquiry model can be applied in any country, in order to train various student skills, especially in terms of searching and investigating something (objects, people, or events) systematically, critically, logically, analytically so that they can formulate their own findings with confidence.

Distribution of Inquiry Publication Manuscripts Based on Research Methods

In terms of research methods, x shows several research methods used in article manuscripts throughout 2020-2023.

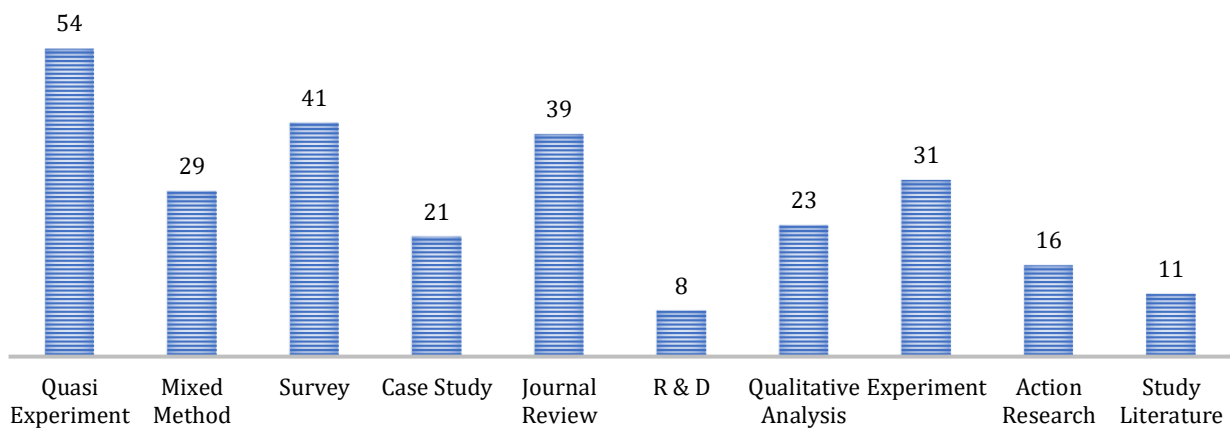


Figure 6. Distribution of Inquiry Publication Manuscripts Based on Research Methods

In the Inquiry model, research methods are used to design and carry out inquiry activities that involve data collection, analysis, and drawing conclusions. Research methods help to ensure that the investigations conducted by students are conducted with a systematic and reliable scientific approach. Research methods commonly used in inquiry research are quasi-experiment, mixed-method, survey, case study, journal review, R&D, qualitative analysis, experiment, actionresearch, and literature study.

Distribution of Inquiry Research Manuscripts in Subject Categories

In terms of research subject categories, Figure 6 shows several research subjects found in the article manuscripts throughout 2020-2023, including teachers, lecturers, students, elementary school students, junior high school students, and high school / vocational school students

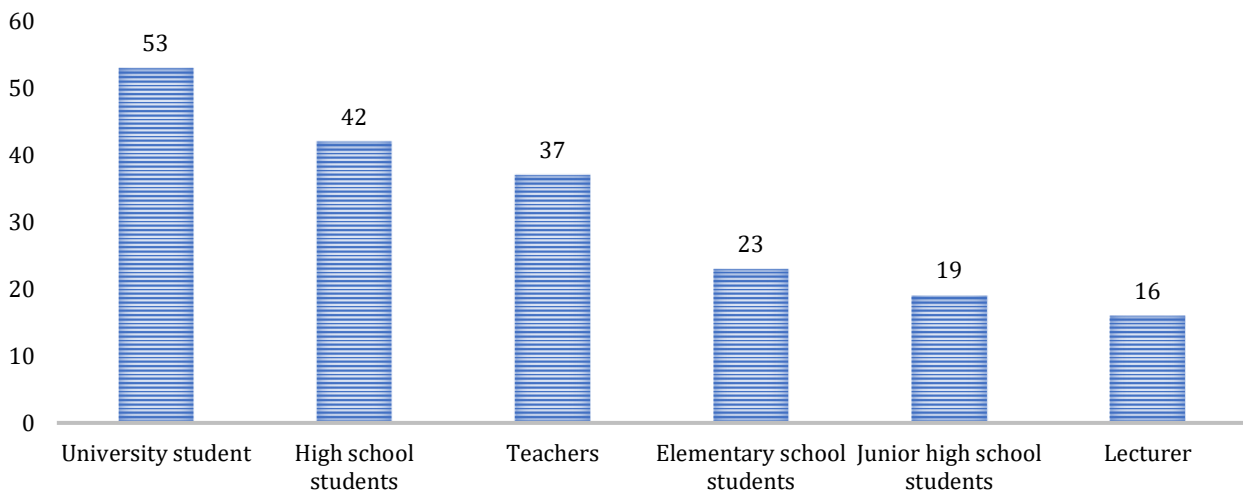


Figure 7. Percentage distribution of inquiry article manuscripts in subject categories

Figure 7 shows the order of the highest number of manuscripts based on the research subject category is university students with 53 manuscripts, followed by high school/vocational school students with 42 manuscripts. Teachers are in the third position with 37 scripts, followed by elementary, junior high, and lecturer students

Visualization of Inquiry Research Trends Based on VOSviewer Software

Research trend mapping is a map visualization that contains topics from science that can help researchers develop their research programs. This visualization can be made using VOSviewer. VOSviewer is a computer program developed to create bibliometric maps (Tupan et al., 2018). In summary, VOSviewer functions to create, visualize, and explore maps based on various forms of networks that show relationships in the citation of a publication (Ab Halim et al., 2021).

Bibliometric mapping with VOSViewer usually uses various database sources such as Google Scholar, Crossreff, Scopus, Web of Science, and Microsoft Academic Search (Aribowo, 2019b). While this research uses Scopus and Google scholar as a database. This is because Scopus and Google scholar are the largest and most reputable databases of national and international scientific publications (Purnomo et al., 2020). Among the 780 manuscripts of Inquiry research articles generated from searches using Publish or Perish with Scopus and Google Scholar databases, researchers can visualize research trends on the topic of Inquiry assisted by the software is VOSviewer. VOSviewe visualization is one of the efforts to help find the novelty of research (Tupan et al., 2018). Figure 6 shows the overall picture of research on Inquiry. Researchers in the world produce 7 main clusters indicated by the colors red, green, blue, yellow, purple, toska, and orange. The first cluster (red color) is science process skills. The second cluster (green color) is science teacher. The third cluster (blue color) is argument driven inquiry. The fourth cluster (light green color) is inquiry in relation to the framework. The fifth cluster (purple color) is experience. The sixth cluster (tosca color) is in relation to critical thinking skills. The seventh cluster (orange color) is structure inquiry.

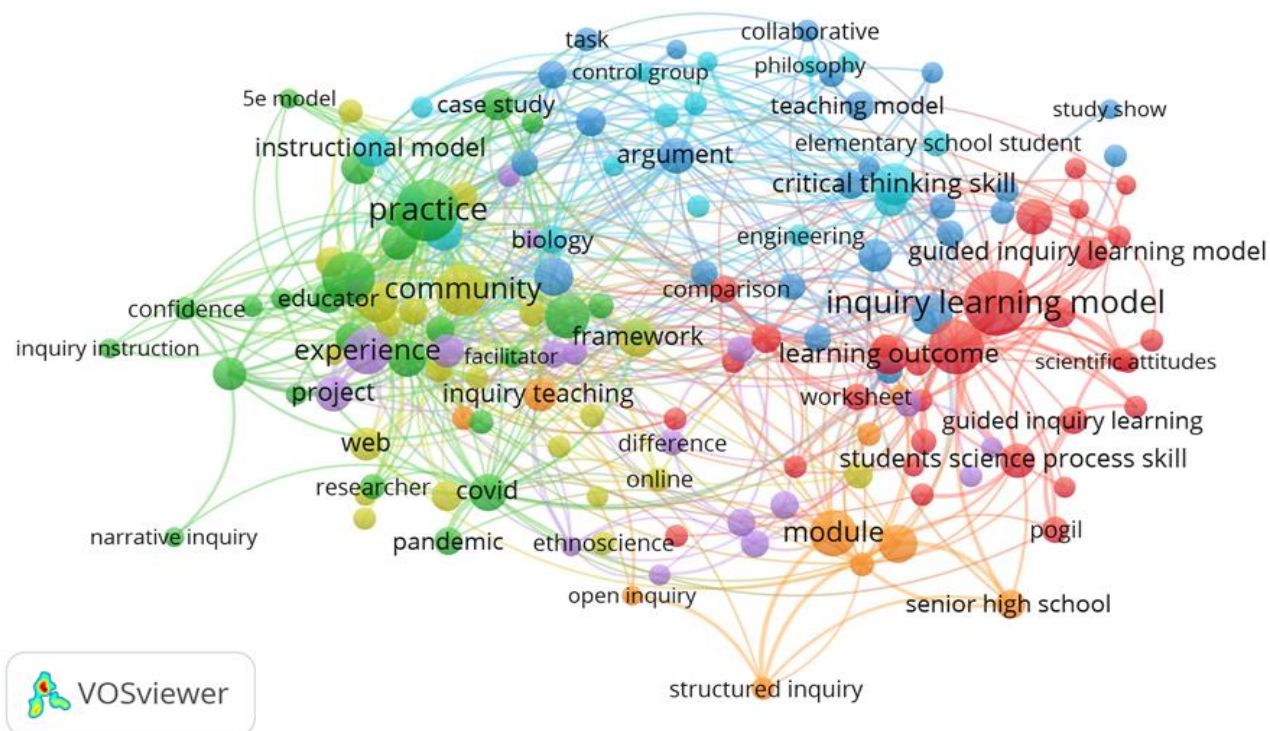


Figure 8. Overview of Inquiry research during 2020-2023 based on Network Visualization results

If we examine the specific relationship between variables to capture the trend and novelty of Inquiry research, several findings are obtained, indicated by the colors red, green, blue, yellow, purple, tosca, and orange.

Bibliometric analysis is a method used to analyze scientific literature with a focus on the number and pattern of citations in these works. VOSviewer is one of the software used to perform bibliometric analysis, and there are several other analysis software such as CiteSpace, BibExcel, and HistCite. Each software has its own focus and advantages, and the choice depends on the purpose of the bibliometric analysis and the level of technical expertise in using the software. The following are the differences between VOSviewer and some other bibliometric analysis software, namely: VOSviewer focuses on network analysis and the interrelationships between bibliographic elements such as authors, keywords, and publications. It helps in understanding the complex relationships between these various elements. VOSviewer is also capable of identifying emerging topics or themes in the scientific literature using cluster mapping analysis or text-based mapping. In addition, VOSviewer is also able to create attractive and intuitive visualizations. It allows users to visualize citation networks, author collaborations, and topics in an easy-to-understand map form. In contrast to VOSviewer, another analysis software is CiteSpace, often used for citation analysis which focuses on the temporal aspect, which means analyzing how citation and collaboration patterns change over time. CiteSpace has tools to model topics based on keywords and visualize them in the form of a map. CiteSpace tends to be more focused on recognizing the structure and development of scientific literature over time. Another software is HistCite, used specifically for historical analysis of scientific literature and its citations. It helps users understand how an area of research evolves over time. HistCite allows users to see a chronological visualization of citations and author collaborations.

Based on the VOVviewer results in Figure 6, it can be explained that cluster 1, namely science process skills, indicated by the red line, provides a finding that research on Inquiry in the realm of science process skills. This is related to the science process skills measured through the implementation of the Inquiry learning model. Through the syntax that exists in Inquiry, it is proven that it can train science process skills (Maison et al., 2019; Rauf et al., 2013).

Cluster 2, namely science teacher, is indicated by a green line, emphasizing that research on Inquiry in the realm of science teacher is studied. Science teacher associated with the Inquiry model is a science teacher who applies the inquiry learning approach in his teaching. Inquiry model is a learning

model that places students as active and independent researchers involved in the process of exploration, discovery, and scientific problem solving (Anderson, 2010; Tessier, 2010). A science teacher using the Inquiry model acts as a facilitator and guide in the learning process. They inspire students to ask questions, identify problems, plan and carry out experiments, collect and analyze data, and make conclusions based on their own findings.

In the Inquiry model, science teachers provide encouragement and guidance to students in developing critical thinking skills, observation skills, questioning skills, and argumentation skills (Kinsey & Moore, 2015; Smith et al., 1984). They help students understand the scientific method and apply it in their own investigations. Cluster 3, Argument Driven Inquiry, is indicated by a blue line, emphasizing that research on Inquiry in the realm of Argument Driven Inquiry (ADI). Argument Driven Inquiry (ADI) is an approach that combines the Inquiry model with a focus on building solid scientific arguments (Afgani et al., 2020; Antonio & Prudente, 2021; Songsil et al., 2019). This approach provides students with opportunities to conduct scientific inquiry centered on building and defending arguments based on evidence and the understanding they develop.

In Argument Driven Inquiry, students are encouraged to act as scientists tasked with answering research questions through the process of scientific inquiry (Chen et al., 2016; Fakhriyah et al., 2021; Salsabila et al., 2019). They identify research questions, design and carry out experiments, collect data, analyze data, and make conclusions based on the evidence they collect. However, what distinguishes ADI from traditional Inquiry models is its emphasis on building scientific arguments (Demircioglu & Ucar, 2015; Erenler & Cetin, 2019; Kurniasari & Setyarsih, 2017). After conducting an investigation, students are invited to present their findings and build an argument based on the evidence they collected. They must use their scientific understanding to explain experimental results, interpret data, and connect their conclusions to relevant scientific concepts

In addition, in ADI, students also learn to consider and evaluate arguments from their classmates. They are encouraged to listen to and critique the arguments of others, and provide responses that are based on evidence and their own developed scientific understanding. This process helps students develop critical thinking skills, argumentation skills and scientific communication skills (Kaçar & Balim, 2021; Metin Peten, 2022; Rosidin et al., 2019).

Through the use of ADI, students not only gain an understanding of science, but also build the ability to think critically, use evidence to support arguments, and communicate effectively (Salsabila et al., 2019). They learn to think as scientists, understanding how science is developed and sustained through building arguments based on empirical evidence.

Overall, ADI links the Inquiry model with a focus on building solid scientific arguments. This approach helps students experience the scientific research process first-hand, develop a deep understanding of science, and build important critical thinking and scientific communication skills.

Cluster 4, frameworks, indicated by the yellow line, emphasizes that research on Inquiry is in the realm of frameworks. In the context of Inquiry models, a framework refers to the structure or guidelines used to support and guide the implementation of Inquiry approaches in learning (Castellanos-Reyes, 2020; González-pérez & Ramírez-montoya, 2022; Rousseau & Billingham, 2018). Frameworks provide a clear structure and systematic steps in designing, implementing, and evaluating inquiry activities in the classroom (Chinn & Malhotra, 2002; Fridley & Sax, 2014; Swan et al., 2020).

Frameworks in Inquiry models usually include the main steps that students and teachers must follow in carrying out the inquiry process. In using the framework in the Inquiry model, teachers can provide clear guidance to students on what is expected of them in each step of the inquiry process (Chinn & Malhotra, 2002). This helps to ensure that students understand the steps to be taken and assists them in developing critical thinking skills, inquiry skills, and scientific communication skills that are important in scientific inquiry.

Cluster 5, Experience, indicated by the purple line, emphasizes that research on Inquiry in the realm of Experience. In the context of the Inquiry model, "experience" refers to the process by which students are directly involved in exploration, discovery, and learning through scientific inquiry activities (Ellis, 2014). Experience is an important component in the Inquiry model as it allows students to develop a deep understanding of scientific concepts and scientific thinking skills (Connelly & Clandinin, 1990; Nixon & Quinlan, 2022; X. M. Wang et al., 2022).

In the Inquiry model, experiences can include a variety of activities such as laboratory experiments, direct observations in the field, independent research, collaborative projects, simulations,

or interaction with digital resources (Lameras et al., 2021; Wilkoszewska, 2015). These experiences are designed to allow students to actively interact with subject matter, scientific concepts, and relevant tools or environments.

Through experiences, students can observe, explore, and try out various aspects of science. They have the opportunity to collect data, observe natural phenomena, test hypotheses, or run experiments to validate or gain new understanding of scientific concepts (Ng et al., 2022; Nixon & Quinlan, 2022). Experiences in the Inquiry model also include opportunities to solve problems or overcome challenges that may arise in the process of inquiry. Students are invited to encounter situations that encourage them to think creatively, make decisions, and test the solutions they find.

The importance of experience in the Inquiry model is that it gives students the opportunity to engage directly in the scientific process, rather than just passively receiving knowledge (Lameras et al., 2021). Thus, they can develop critical thinking skills, problem-solving skills, observation skills, and collaboration skills. In addition, experience can also build students' interest and motivation in learning science. By directly experiencing concepts and phenomena in science, students can develop emotional and experiential connections that give meaning and relevance to their learning.

Cluster 6, namely Critical Thinking Skills, is indicated by a tosca color line, emphasizing that research on Inquiry in the realm of Critical Thinking Skills. Critical thinking skills are the ability to analyze, evaluate, and interpret information critically (Demirel, 2017; Dunne, 2015; Saputra et al., 2019). In the context of the Inquiry model, critical thinking skills are an important aspect that is emphasized in the scientific inquiry learning process.

In the Inquiry model, students are encouraged to think critically in several aspects, including: formulating relevant questions, analyzing and interpreting data, evaluating and drawing conclusions, analyzing arguments and evidence, compiling and presenting arguments (Muhan & Nasrudin, 2021). Through the Inquiry model, students engage in scientific problem solving that involves the active use of critical thinking skills. This model stimulates students to question, analyze, evaluate, and present arguments based on scientific evidence. In this process, students develop critical thinking skills that are important in scientific understanding, decision-making, and problem-solving in everyday life.

Cluster 7, Structure Inquiry, indicated by the orange line, emphasizes that research on Inquiry is in the realm of Structure Inquiry. This is related to one of the types of inquiry. Structure Inquiry, or often also called Guided Inquiry, refers to an approach in the Inquiry model where the teacher provides an organized framework or structure to guide students in the process of scientific inquiry (Kinsey & Moore, 2015). In this structure, students still have the freedom to conduct their own investigations and discoveries, but with guidance and guidance provided by the teacher (Mutezo & Maré, 2022).

The purpose of Structure Inquiry is to assist students in developing scientific thinking skills and lead them to a deeper understanding of scientific concepts (Brown et al., 2021; Podrigalo et al., 2022). This is important because it has several important benefits, namely: 1) Deeper Understanding, in Structure Inquiry, students do not only receive information passively, but they are also actively involved in exploring scientific concepts and phenomena. This helps them understand concepts more deeply than just memorizing facts. Deep understanding allows students to link the concepts they learn with the real world, thereby strengthening their learning., 2) Critical Thinking Skills, through Structured Inquiry, students are invited to ask questions, formulate hypotheses, design experiments or investigations, collect and analyze data, and draw conclusions. All of these steps involve critical thinking skills, such as evaluating evidence, problem solving, and logical analysis. These skills are important in developing students' ability to think critically and rationally., 3) Development of Research Skills, Structure Inquiry encourages students to undergo a more structured research process. They learn how to design experiments or investigations, collect data, analyze results, and compile scientific reports. These skills are not only valuable in educational contexts, but also in the real world where the ability to conduct research and analyze information is a highly sought after skill., 4) Motivation and Engagement, Structured Inquiry Approach is more attractive to students because they have an active role in the process. learning. This can increase their motivation to learn and strengthen engagement in the subject matter. Students feel more connected to the subject matter because they can see how abstract concepts relate to the experiences and knowledge they have., 5) Independence and Problem Solving, students learn to be more independent in overcoming challenges and solving problems. They develop confidence in exploring the scientific world and overcoming obstacles they may encounter in the process of inquiry.

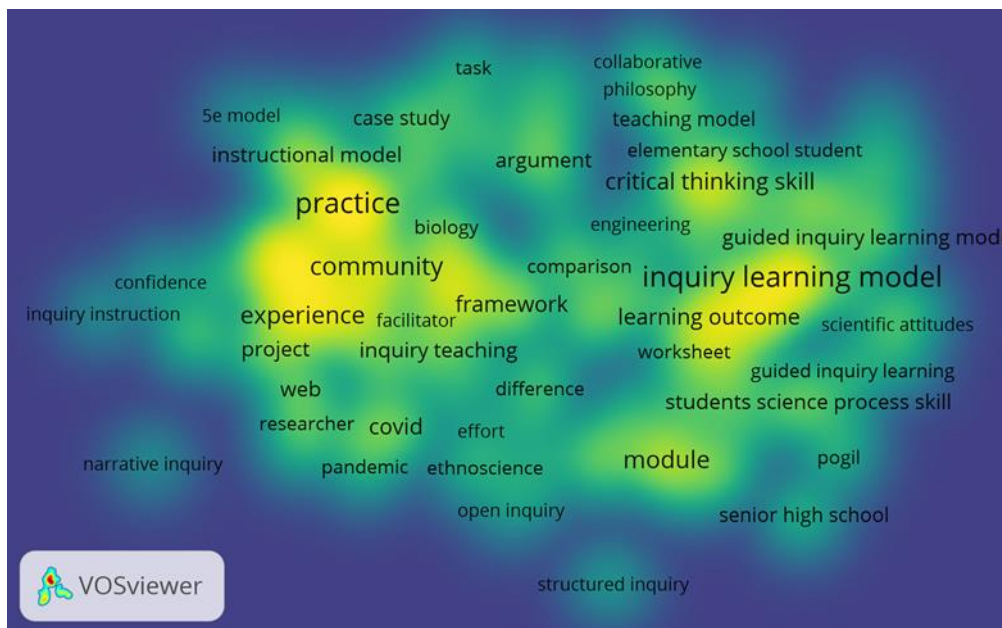


Figure 10. Overview of Inquiry research during 2020-2023 based on Density Visualization results from VOSviewer

Based on Figure 10 Density Visualization from VOSviewer shows whether or not the research is carried out frequently, meaning that the darker the color in the image means that research topics are still rarely carried out (Akbari et al., 2020; Francis et al., 2021; Rosalinda et al., 2022), so that it can be our consideration to develop related topics .

CONCLUSION

In this paper, the author uses bibliometric methods to study the state of research in a particular field of knowledge. The development of Inquiry, identifying the main sources of the number of Inquiry research each year, the distribution of Inquiry publications based on the highest number of citations, the distribution of Inquiry publications based on research locations, the distribution of Inquiry research papers in subject categories, and the visualization of Inquiry research trends based on VosViewer software during 2020-2023. Visualization of Inquiry research trends resulted in 7 main clusters indicated by red, green, blue, yellow, purple, tosca, and orange. The first cluster (red color) is science process skills. The second cluster (green color) is science teacher. The third cluster (blue color) is Inquiry in relation to Argument driven inquiry. The fourth cluster (light green color) is Inquiry in relation to the framework. The fifth cluster (purple color) is experience. The sixth cluster (tosca color) is Inquiry in relation to critical thinking skills. The seventh cluster (orange color) is structure inquiry. The research findings can help related researchers to recognize the global Inquiry research trends and recommend directions for further research. Based on the results of bibliometric analysis of inquiry research articles from several countries through Density Visualization from VOSviewer, it shows whether or not research is carried out, meaning that the darker the color in the image means that the research topic is rarely carried out so that it can be recommended for further research to develop related topics. Topics that are rarely carried out, for example, structure inquiry, narrative inquiry, instruction inquiry and scientific attitude.

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