

Developing Critical Thinking Indicators and Research Trends in Islamic Religious Education with VOSviewer

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Abstrak

Penelitian ini bertujuan untuk mengembangkan indikator berfikir kritis siswa dan menemukan *state of the art* dengan menggunakan Vos Viewer. Salah satu cara untuk mengembangkan indikator berfikir kritis melalui sebuah penelitian. Tugas guru selain mengajar adalah melakukan penelitian. Penelitian dikatakan baik jika menemukan unsur temuan baru sehingga memiliki kontribusi baik bagi keilmuan maupun bagi kehidupan. Salah satu kesulitan dalam penelitian adalah menemukan novelty, saat ini dengan aplikasi Vos Viewer maka dengan mudah menemukan kebaruan dari sebuah variabel penelitian, seperti variabel berfikir kritis. Subyek penelitian siswa pada lembaga pendidikan Islam. Obyek atau fokus penelitian adalah mengembangkan indikator berfikir kritis siswa pada pembelajaran pendidikan agama Islam. Selain itu penelitian bertujuan menganalisis peluang dan perkembangan tren penelitian terkait *critical thinking* dalam pembelajaran agama Islam. Penelitian ini penting sebagai satu cara untuk membantu guru-guru pendidikan agama Islam mengembangkan indikator berfikir kritis sebagai upaya membiasakan siswa mengimplementasikan literasi membaca dan numerasi sesuai dengan tuntutan kurikulum merdeka. Metode yang digunakan bibliometrik dengan pengumpulan data artikel dari tahun 2018-2022 melalui situs Google Scholar dan Scopus dengan software Publish or Perish 1.000 jurnal. Hasil penelitian mendeskripsikan bahwa indikator berfikir kritis dapat dikembangkan melalui membiasakan siswa menganalisis, mengevaluasi dan mencipta. Hasil penelitian dengan aplikasi Publish or Perish (PoP) menetapkan berfikir kritis dan keterkaitannya dengan pendidikan agama Islam belum banyak yang meneliti.

Kata Kunci: Keterampilan berfikir kritis, pendidikan agama islam

Abstract

This research aims to develop indicators of students' critical thinking and find the state of the art by using Vos Viewer. One way to develop critical thinking indicators is through research. The teacher's job besides teaching is to conduct research. Research is said to be good if it finds elements of new findings so that it has a contribution both to science and to life. One of the difficulties in research is finding novelty, nowadays with the Vos Viewer application it is easy to find the novelty of a research variable, such as the critical thinking variable. The research subject is students in Islamic educational institutions. The object or focus of the research is to develop indicators of students' critical thinking in learning Islamic religious education. In addition, the research aims to analyze the opportunities and development of research trends related to critical thinking in Islamic learning. This research is important as a way to help Islamic religious education teachers develop critical thinking indicators as an effort to familiarize students with reading literacy and numeracy in accordance with the demands of the independent curriculum. The method used is bibliometric by collecting article data from 2018-2022 through Google Scholar and Scopus sites with Publish or Perish software for 1,000 journals. The results of the study describe that critical thinking indicators can be developed through familiarizing students with analyzing, evaluating, and analyzing.

Keywords: Critical thinking skill, islamic religious education

Introduction

Critical thinking is a tool for learners to develop. By being taught critical thinking skills, learners are empowered to analyze, evaluate, and make informed decisions. There are four competencies that can be strengthened and empowered to students. They are critical thinking skills, creativity skills, communication skills, and collaboration skills. Wagner (Wagner, 2010) stated that there are seven skills needed in the 21st century, namely: (1) critical thinking and problem-solving skills, (2) collaboration and leadership, (3) agility and adaptability, (4) initiative and entrepreneurial spirit, (5) able to communicate effectively both orally and in writing, (6) able to access and analyze information, and (7) have curiosity and imagination.

So the 21st century demands education to prepare students who can face global economic competition. *The Partnership for 21st Century Skills* emphasizes that 21st-century learning must teach four competencies: *communication, collaboration, critical thinking, and creativity*. (Frydenberg, M., & Andone, 2011) It also states that to face learning in the 21st century, everyone must have critical thinking skills, digital literacy knowledge and abilities, and media literacy and master information and communication technology

The field of Islamic Education answers these challenges with various innovations that continue to be developed. These innovations are implemented in the form of new models, methods, or ideas, conceptually, theoretically, and in learning practices. Islamic education is not only about knowing God or Islamic concepts, but students must be able to think based on facts, analyze data, and think critically. Critical thinking requires a process to solve problems, analyze problems and sub-problems, and think carefully from all points of view.

In Islamic religious education (Mardhiah et al., 2021), thinking critically is one of the abilities emphasized in the 2013 curriculum. The Decree of the Minister of Religious Affairs No. 183 of 2019 concerning the Islamic and Arabic Language Education Curriculum in Madrasah confirms that one of the reasons for developing the 2013 curriculum in subjects is to develop critical and solutive learning patterns. Thus, PAI learning curriculum 2013 must be able to accommodate students' critical thinking skills. For this reason, the Decree of the Minister of Religious Affairs stipulates that the ability to think critically is one of the core competencies that must be achieved in every PAI subject, which includes akhlak akidah, Qur'an hadith, fiqh, and SKI. (Narulita et al., 2022)(Minister of Religious Affairs of the Republic of Indonesia, 2019).

High-level thinking skills (HOTS) in Islamic Religious Education are mental processes that include the ability to formulate problems, give and analyze arguments, make observations, compile hypotheses, perform deductions and inductions, evaluate, make decisions and carry out actions

The results of Bahri and Supahar's research reinforce that *students' critical thinking in Islamic Education Subjects* must be owned, especially in solving religious and religious problems. This research also compiled an integrated test instrument for religion and science to measure critical thinking skills in high school PAI learning (Bahri & Supahar, 2019). Taufiqurrahman et al. compiled a measurement instrument for higher-order thinking skills (HOTS) in PAI (Taufiqurrahman et al., 2018). However, based on research by Zulfa et al. (Zulfa Indah Pratiwi & Dewi Maharani, 2020), it is claimed that this ability is in the category of not good because students are not trained in terms of examining, questioning, attributing, and seeing consistency in an Islamic religious education problem.

Learning Islamic Religious Education for male and female students, in addition to requiring critical thinking skills, also requires problem-solving (Cahyono, 2017); problem-solving skills related to planning skills in solving problems and utilizing various information

to develop qualified strategies so that problems can be solved effectively and efficiently (Zulfa Indah Pratiwi & Dewi Maharani, 2020).

In research, an analysis is needed, one of which is bibliometric analysis. Bibliometrics is a method used to introduce scientific publications related to scientific citations used in library science or other fields. Bibliometrics, according to the method used in an article that is descriptive to find out the author, the level of collaboration, and literature, it can be concluded that bibliometrics is literature in scientific publications to find out the analysis of writing, author, and literature.

Research Method

The VOS Viewer application is used to create bibliometric maps on a computer program. Its purpose is to analyze and visualize citation relationships in articles. VOS Viewer can search databases such as Google Scholar, Scopus, Crossref, Semantic Scholar, and PubMed. Bibliometric research has also been conducted on the critical thinking ability of Islamic Religious Education. However, it is important to maintain objectivity and avoid subjective evaluations. It has been claimed that the variable has been widely studied, but it has not been linked to problem-solving. This bibliometric research aims to analyze research trends on problem-solving related to Islamic Religious Education using VOS Viewer and identifying themes that have been little researched in the past.

Bibliometric analysis research methods are utilized to address research inquiries by examining research advancements and literature (Shuhaimi, Awang, and Jaafar 2024) (Hakim, 2020). The metadata of scientific journals on mathematical critical thinking ability based on problem-solving was mapped using reputable and accredited international journals from quartile 3 (Q3) and national journals from Sinta 2 to Sinta 6 (S2-S6) obtained from the Google Scholar website. A total of 1,000 journals from 2017-2022 were included. The first stage of bibliometric analysis involves collecting articles related to mathematical critical thinking skills using Publish or Perish (PoP). The data is then processed and analyzed using Microsoft Excel to generate tables and graphs. Additionally, VOS Viewer. is used to visualize the article data in the form of a network. The following description explains the stages of bibliometric analysis.

Firstly, the PoP software was used to search for research articles using the keyword 'Islamic religious education critical thinking skills based on problem-solving' with a search year range of 2017-2022 and a maximum of 1000 results. Google Scholar was selected as

the database for the search due to its ease of use and accessibility. The results are displayed in Figures 1 and 2.

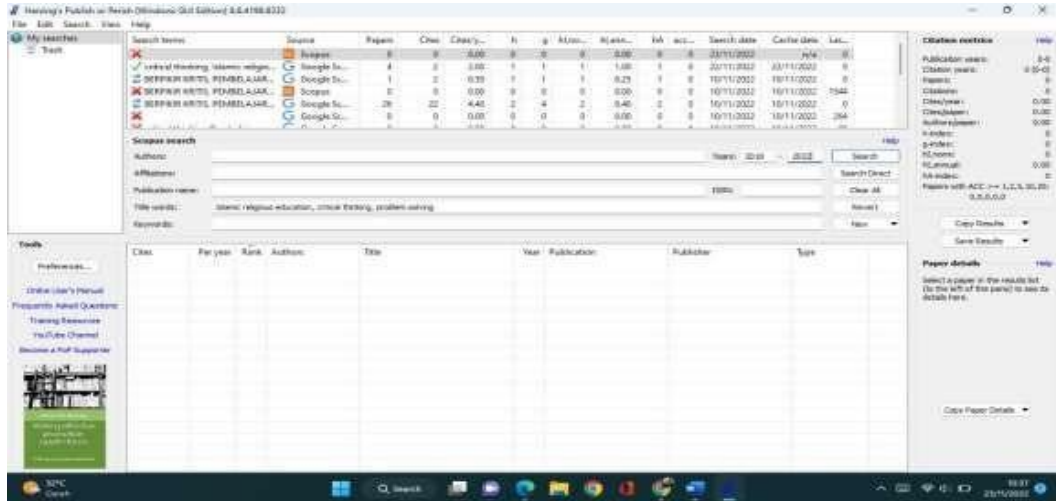


Figure 1. Scopus Database Search

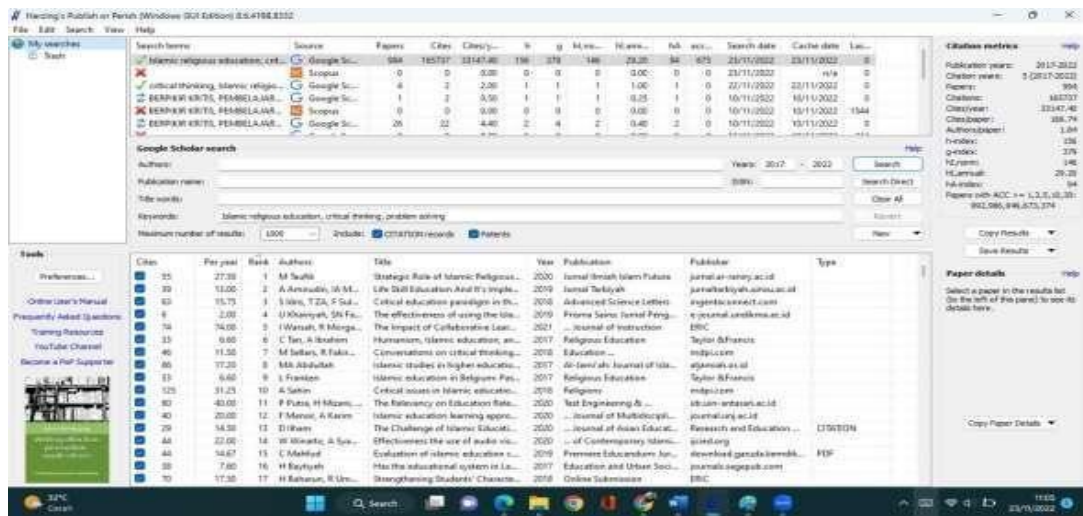


Figure. 2 Google Scholar Database Search

Figures 1 and 2 show that the maximum number of searches allowed in Google Scholar is 1000. We could have entered a value of less than 1000 but would get a less detailed map. From Figures 1 and 2, information on *citation marks* is obtained that describes the quantitative data, which is shown in Table 3.

Table 3. Citation Marks

Result	Explanatory
Keyword	<i>Islamic religious education critical thinking skills based on problem-solving using Publish or Perish</i>
Publication Years	2017-2022
Citation Years	5 (2017-2022)
Paper	997
Citations	442.775
Cites/years	63253.57
Cites/Paper	444.11
Author/Paper	2.61
H-Index	266
G-Index	641
hI, norm	197
hA, annual	28.14
Ha- Index	121

Paperswith ACC>= 1,2,5,10,20:992,986,946,673,374

The explanation of Table 3 can be found in the Results and Discussion section. The data from Figure 3 is stored in several formats, including CSV and RIS. CSV is used for processing table and graphic data, while RIS is used for processing data in the form of networks and maps using VOS Viewer software. VOS Viewer software is used to analyze the development of scientific publications and the ability to think critically in mathematics based on problem-solving. The processed data is presented through network visualization, overlay visualization, and density visualization. The network visualization map displays the linkages and clusters of research themes related to keywords. Overlay visualization is used to identify the year in which the related research theme was conducted. Density visualization, on the other hand, is used to analyze research themes that are already saturated and have not been studied extensively.

Result and Finding

The Concept of Critical Thinking in Islamic education

The ability to think critically is one of the essential intellectual capital that is very important for everyone, this ability is a fundamental part of human maturity. Critical thinking is thinking reasonably and reflectively by emphasizing decision-making about what to believe and do. Critical thinking is analyzing ideas or ideas in a more specific direction, distinguishing, selecting, identifying, studying, and developing them in a perfect direction. Richard Paul (Bunge, 1997) defines that: "Critical thinking is that mode of thinking – about any subject, content or problem – in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them. Critical thinking is a model of thinking about anything,

substance, or problem. The thinker improves the quality of his thinking by skillfully handling the structures inherent in thinking and applying intellectual standards to it.

Ennis (Reeder, 1984) defines critical thinking as reflective thinking that focuses on decision-making patterns about what to believe and should do. Critical thinking people will evaluate and then infer a thing based on facts to make a decision.

Critical thinking skills are the ability to think at a complex level and use analysis and evaluation processes. Critical thinking involves inductive thinking skills such as recognizing relationships, analyzing open problems, determining cause and effect, making conclusions, and accounting for relevant data. At the same time, deductive thinking skills involve solving spatial problems and logical syllogisms and distinguishing facts and opinions. From the opinions regarding the definition of critical thinking above, the author can conclude that critical thinking is deep, complex, and essential. So critical thinking that leans towards cognitive elements is crucial in creating an intellectual/knowledge basis for students.

In modern education, critical thinking is an important thing to develop. There are several considerations for developing critical thinking. According to H.A.R Tilaar (Tilaar, 2011), there are four considerations why critical thinking needs to be developed in modern education including:

1. Developing critical thinking in education means rewarding students as a person (respect as a person).
2. Critical thinking is an ideal goal in education because it prepares learners for their life of maturity.
3. The development of critical thinking in the educational process is a traditional ideal such as what is to be achieved through the study of the exact sciences.
4. Critical thinking is something that is needed in democratic life. So critical thinking must be developed.

The application of Islamic education learning to reach the HOTS level must meet the level of analyzing, evaluating, and creating, as Anderson & Karthwohl said, which categorizes the ability of the process of analyzing, evaluating, and creating, including high-level thinking. In the learning process, it can be seen at the level of analyzing when students do group assignments by making analysis results, such as project assignments to make videos given by teachers, then presented and shown material about tolerance in Indonesia, then poured in the form of mind mapping. Students present n from the perspective of student

knowledge; this learning model shows that students are already able to think critically and solve problems. At the level of evaluation, it can be seen when teachers deliberately give incorrect statements regarding tolerance material in Indonesia, aiming to stimulate students to think and convey their arguments. The level of creativity in learning can be seen when the teacher evaluates student changes after learning, such as students' attitudes towards differences in religion, ethnicity, language, and customs. Meanwhile, other evaluations carried out by PAI teachers in seeing student success are carried out by giving several questions at the end of the lesson orally and if they have entered two or three new meetings, give questions in writing referring to the HOTS indicator.

The Trend of Research in The Field of Islamic Religious Education and Critical Thinking Skills

Based on Figure 3, the center of research related to Islamic religious education critical thinking skills based on problem-solving where there are 8 clusters or groups marked in red in group 1, green in group 2, blue in group 3, blue in group 4, light green in group 5 purple and blue in group 6 and brown in group.

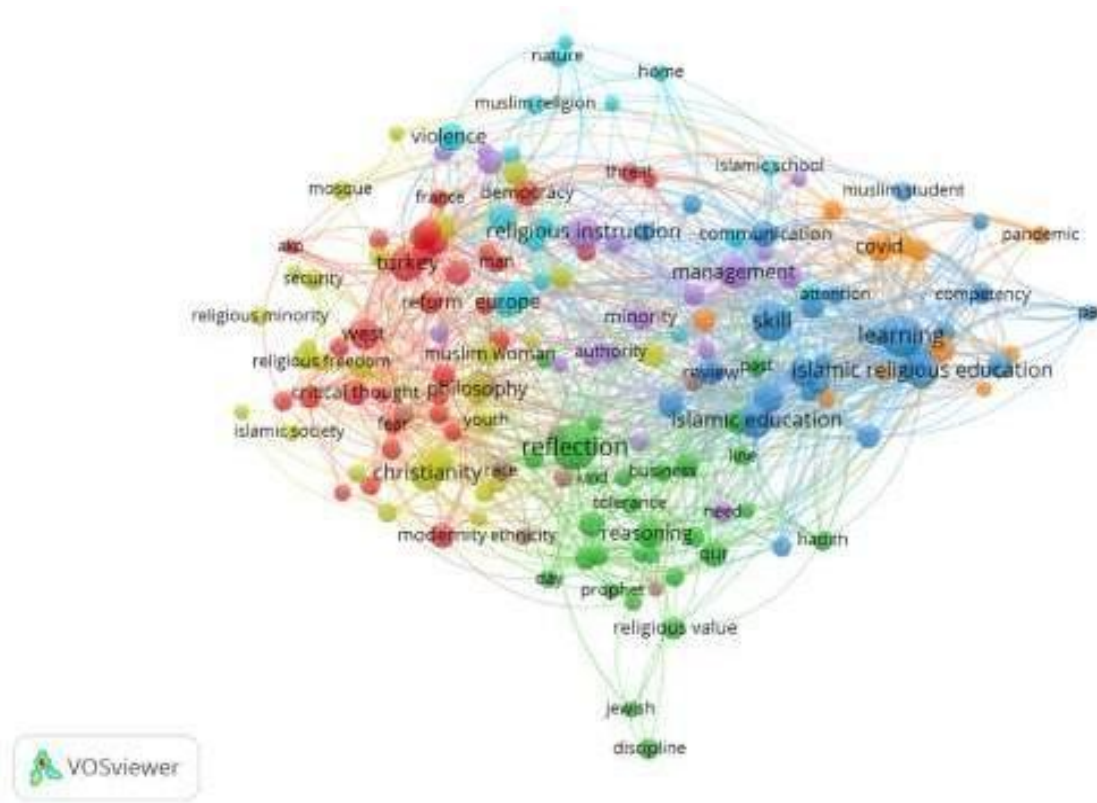


Figure 3. Network Visualization VOS Viewer

The results of network visualization using VOS Viewer show the relationship between variables/themes consisting of 88 variables where 23 variables are contained in cluster 1, 20 variables are in cluster 2, 16 variables are in cluster 3, 14 variables are in cluster 4, 11 variables are in cluster 5, and 4 variables are in cluster 6. For example, in cluster 1, the thinking variable is related to the variable, Islamic religious education, Islamic education, religious Value, religious Instruction, Religious Leader, discipline, learning, Islamic School Muslim religion beginning, skill, Islamic Reflection, Critical Thinker, Islamic Society, perspective, tolerance, and others. Research on thinking is related to many of these variables, but some are rarely studied related to Islamic religious education critical thinking skill based on solving problem can be seen figure 4

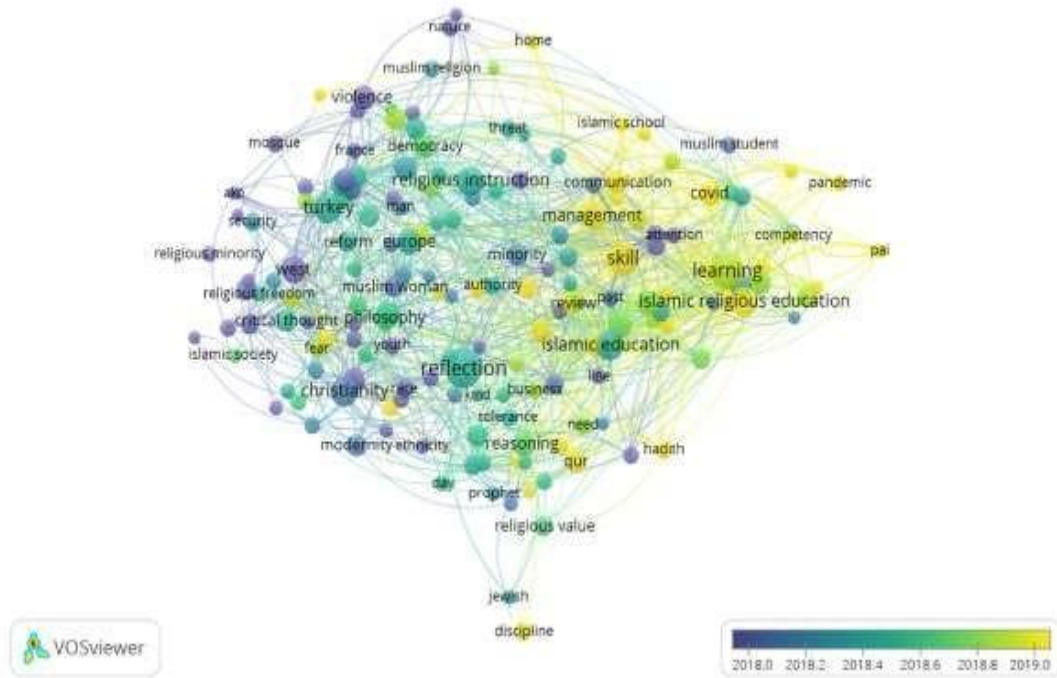


Figure 4. Network Visualization VOS Viewer

The results of overlay visualization in Figure 4 using VOS Viewer show that thinking variables were widely published between 2017-2018, closely related to critical thinking skills based on problem-solving. The results of overlay visualization also show in 2018-2022 variables as research centers. At the same time, the results in 2020-2022, as discussed, include Islamic Education, Religious Education, religious instruction, skills, and reflection.

The Development of Research Variables with Vos Viewer

Teachers have a duty in addition to teaching is to conduct research, such as classroom action research and other forms of research. research results must be reported in the form of articles and others. The difficulty for teachers and other people in general is finding new and much-needed research variables at this time. In the 4.0 era we no longer need to manually collect articles or books to find new variables for research. Islamic education teachers can use the VOS Viewer application and others to find new variables effectively and efficiently. The following is an example of the results of searching for research variables that have not been widely researched in the field of Islamic religious education.

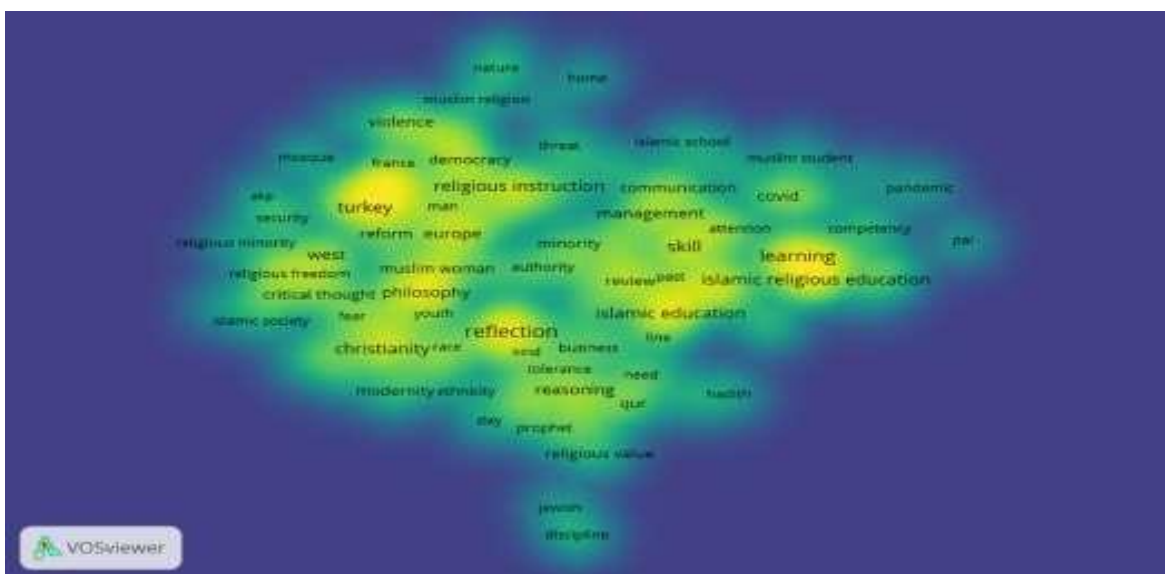


Figure 5. Density Visualization VOS Viewer

Figure 5 shows density visualization using VOS Viewer, which occurs in the topic of critical thinking skills of Islamic education based on problem- solving. According to the results of research conducted by Tupan et al. (2018) in density visualization, there are several regional colors, such as yellow, green, and blue, which indicate each result obtained according to the region's color. If the color of the region is marked yellow like a thinking variable, it has been done a lot (Eryanti & Soebagyo, 2019; Karim & Soebagyo, 2021) so that there is a relationship between topics while the area is greenish-yellow such as religious values and religious education and blue areas such as PAI, Islamic school, Muslim Student and Pandemic this means that it has not been done much so that in this result it shows that there is a novelty that can be developed (Ajinegara & Soebagyo, 2022; Sugestiana & Soebagyo, 2022). Related higher-order thinking skills are similar in research that concludes

that further research needs to be carried out to reveal more tactics mastered by students in order to be able to solve a problem (Leonisa & Soebagyo, 2022).

Conclusion

The results of the study based on overlay visualization and density visualization in 2018-2020 centered on variables related to critical thinking in Islamic religious education that have opportunities and novelty to be researched in the future are learning variables, higher order thinking skills, and Islamic religious education. The results of research on the development of indicators using VOS Viewer on indicators of critical thinking in Islamic religious education learning, which is the ability to analyze, evaluate and create or provide idea and idea.

Bibliography

- Bahri, M. F., & Supahar, S. (2019). Kemampuan Berpikir Kritis Menggunakan Tes Terintegrasi Agama dan Sains dalam Pembelajaran PAI di SMA. *Edukasi Islami: Jurnal Pendidikan Islam*, 8(2), 233–251.
- Bunge, M. B. (1997). Richard Paul Bunge, M.D. *Experimental Neurology*, 148(2), 395–396. <https://doi.org/10.1006/exnr.1997.6726>
- Cahyono, B. (2017). Analisis Ketrampilan Berfikir Kritis Dalam Memecahkan Masalah Ditinjau Perbedaan Gender. *Aksioma*, 8(1), 50. <https://doi.org/10.26877/aks.v8i1.1510>
- Frydenberg, M., & Andone, D. (2011). “Learning for 21 st.” *Journal; Century Skills*.
- Mardhiah, I., Hadiyanto, A., Amaliyah, A., & Hakam, A. (2021). Developing Learning Competencies of Multicultural and Local Wisdom Values-Based Islamic Religious Education in Higher Education in Indonesia. *Hauula: Indonesian Journal of Multidisciplinary Islamic Studies*, 5(1), 81–92. <https://doi.org/10.21009/005.01.04>
- Narulita, S., Hyangsewu, P., & Diens, A. (2022). Moderate Muslim Characters in The Quran and Its Implementation in Islamic Religious Education Learning in Public Universities. *Jurnal Online Studi Al-Qur’an*, 18(1), 75–90. <https://doi.org/10.21009/jsq.018.1.04>

- Reeder, H. (1984). The Nature of Critical Thinking. *Informal Logic*, 6(2), 1–8.
<https://doi.org/10.22329/il.v6i2.2729>
- Shuhaimi, Joharri, Hapini Awang, and Mohd Fairuz Jaafar. 2024. “Worldwide Research history and Trends on Blockchain Applications in Education : A Bibliometric Analysis , 2017-2022.” *Multidisciplinary Reviews* 7(3).
- Taufiqurrahman, T., Heryandi, M. T., & Junaidi, J. (2018). Pengembangan Instrumen Penilaian Higher Order Thinking Skills Pada Mata Pelajaran Pendidikan Agama Islam. *Jurnal Pendidikan Islam Indonesia*, 2(2), 199–206.
<https://doi.org/10.35316/jpii.v2i2.74>
- Tilaar, H. A. R. (2011). *Pedagogik Kritis, perkembangan, substansi, dan perkembangannya di Indonesia*. Rineka Cipta.
- Wagner, T. (2010). *Overcoming The Global Achievement Gap*. Mass: Harvard University.
- Zulfa Indah Pratiwi, & Dewi Maharani. (2020). Penerapan Pembelajaran Pendidikan Agama Islam (PAI) Berbasis Higher Order Thinking Skills (Hots). *Jurnal Qiroah*, 10(2), 57