

## Bibliometric Analysis of Youtube Platform Research Trends Using the Vosviewer Application

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### ABSTRACT

**Background.** Youtube is said to be a media called alternative media. This is said because YouTube makes it easy for teachers or students to be able to carry out learning very well and can make students have increased learning activities and material can be easily understood quickly.

**Purpose.** The aim of this study to find out the effect of using YouTube as an online learning material so that the teaching and learning process continues to run well).

**Method.** The method used in this study is a bibliometric analysis technique that includes RIS data components indexed by journals and by discussing research on YouTube as a learning medium..

**Results.** This shows that YouTube learning media is well used as a learning medium.

**Conclusion.** What can be taken is that YouTube learning media has a positive influence on ease of access, student interest in learning, and improving learning outcomes. In addition, research conducted using the keyword "YouTube Learning Media" over a period of time demonstrates the existence of broad research clusters, interactions, and trends in the context of the YouTube platform. The limitation of this research is using bibliometric data which is limited to indexed journals related to YouTube as a learning medium. This could lead to bias in the data sample, so the findings may not cover all relevant research on YouTube use as an instructional medium. The research recommendation is to conduct qualitative research to deepen understanding of students' and teachers' experiences in using YouTube as a learning medium. This research can involve interviews, observations, or case studies to gain deeper insight into the benefits, challenges, and effects of using YouTube in a learning context.

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### KEYWORDS

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### INTRODUCTION

Social media has become something that is loved by all groups, from children to adults. The rapid development of social media allows all people to have it privately and with a wide reach (Amin, 2019). In contrast to traditional media that need to use services and very large capital, social media that is currently developing does not need to use large capital and manpower because access can be done anywhere and can be done very quickly.easy.



Learning is a thing where there is a process between students and their teachers. In a study (Corte, 2019; Dabić, 2020), students and their teachers carry out things that influence each other with the aim of being able to carry out achievements in a lesson). In a learning process, of course (Casado-Aranda, 2021; Corte, 2019), media is needed that can support the learning process so that learning becomes something that can be understood well and fun (Bartolacci, 2020, 2020).

Learning media is something that consists of several tools and materials used in discussion activities in a lesson where these tools and materials can support students to be able to carry out a lesson so that it can be easy to understand and fun (Corte, 2019; Dabić, 2020). Learning media that can be chosen properly will make students enthusiastic about carrying out learning, then the results achieved will certainly be maximized because students have a very high enthusiasm for learning (Aparicio, 2019; Calderón, 2020).

In modern times and technological advances like today (Batistič, 2019; Corte, 2019), social media can be used as a learning support tool. One of the social media that is often used as a learning medium is YouTube. YouTube is a video displayed online that has been provided by Google. YouTube is an online video site that can be used to search for all kinds of videos in the world. Based on several learning media that have been used (Alnajem, 2021; Danvila-del-Valle, 2019), YouTube is one of the media used to assist the learning process in the classroom. YouTube is able to provide learning with audio visual so that YouTube with its capabilities can provide its own interest for students to be able to pay attention to the learning activities contained in the classroom. YouTube learning media can be studied at home and can be watched by students at any time and can be repeated. Teachers can easily share the YouTube link then students can repeat what is on YouTube at other times (Corte, 2019; Dabić, 2020).

YouTube is said to be a media called alternative media. This is said because YouTube makes it easy for teachers or students to be able to carry out learning very well and can make students to have increased learning activities and the material can be easily understood quickly (Alnajem, 2021; Dabić, 2020). The learning materials provided by the teacher certainly have different levels of difficulty (Ante, 2021; Batistič, 2019). Based on this, YouTube can be used as a medium that can be used to broadcast various kinds of learning videos that can be accessed without using fees or can be accessed free of charge (Benita, 2021; Colares, 2020).

Bibliometrics is a method used in a study to be able to statistically analyze previous literature. Analysis carried out using the bibliometric method can be carried out descriptively because it reviews the characteristics or characteristics contained in an existing literature. Bibliometrics continues to experience development (Alryalat, 2019; Dervis, 2019), one of its developments is having ties with electronic media where an analysis is carried out statistically and using electronics (Dervis, 2019; Dhamija, 2020).

Bibliometrics is an approach or method used in research to analyze and measure literature or previous scientific publications quantitatively (Ante, 2021; Corte, 2019). This method involves collecting bibliographic data, such as title, author, journal publication (Amin, 2019; Ante, 2021), abstract, and keywords, to identify trends, patterns (Alnajem, 2021; Ardito, 2019), and relationships in existing literature (Baker, 2020; Dervis, 2019). Bibliometrics in research has several purposes (Aparicio, 2019; Baier-Fuentes, 2019). First, by analyzing previous literature, researchers can understand scientific developments and research trends in a particular field. This allows researchers to know topics that have been widely researched (Casado-Aranda, 2021; Dhamija, 2020), issues that have not been resolved (Dabbagh, 2019; Dabić, 2020), and the direction of future research development (Baker, 2020; Corte, 2019).

Furthermore (Casado-Aranda, 2021; Ciano, 2019), bibliometrics is also used to identify influential authors in a field (Alryalat, 2019; Corte, 2019), as well as studying collaborations between authors or institutions. By analyzing the patterns of writing and collaboration between writers (Alnajem, 2021; Caviggioli, 2019), researchers can see the influence of individuals in producing scientific work and identify collaboration networks that can influence research development. In addition, bibliometrics can be used to measure research impact and productivity (Ardito, 2019; Corte, 2019). Metrics such as the number of citations or the h-index are used to evaluate the quality and impact of scientific publications and profiles of researchers (Bonilla-Aldana, 2020; Ciano, 2019).

In practice, there are several methods or analyzes that are commonly used in bibliometrics. One of them is citation analysis, which involves counting the number of citations received by an article or author. This method can provide information about the influence of an article or author in the scientific community. Furthermore (Bartolini, 2019; Dabbagh, 2019), there is co-citation analysis which involves calculating the frequency of occurrence of two or more articles in the citation list of an article (Bouzembrak, 2019; Dabbagh, 2019). With this analysis, a relationship can be identified between articles that are often cited together, indicating a connection or topic similarity (Alryalat, 2019; Aristovnik, 2020). In addition, co-clustering analysis is also used in bibliometrics to group articles based on similar citation patterns. With this method (Colares, 2020; Corte, 2019),

The main benefit of using bibliometrics is to provide a deeper understanding of research developments in a field. By analyzing bibliographic data and bibliometric metrics, researchers can identify trends, patterns of collaboration, and influence in specific research areas (Colares, 2020, 2020). This information can be used to guide further research, identify unfulfilled research gaps, and facilitate collaboration between researchers. However (Ciano, 2019; Dabbagh, 2019), keep in mind that bibliometrics has some limitations (Asokan, 2019; Caviggioli, 2019). This method only involves analysis of bibliographic data and does not take into account the quality or content of scientific publications. In addition, bibliometrics can also be affected by factors such as citation bias and changes in research trends.

Therefore, it is important to use bibliometrics as a tool in research, but still complement the analysis with a qualitative approach and contextual understanding of the existing literature. In conclusion, bibliometrics is an analytical method used in research to measure (Aparicio, 2019; Danvila-del-Valle, 2019), analyze, and understand literature or previous scientific publications quantitatively. This method provides insight into research developments (Alnajem, 2021; Caviggioli, 2019), collaboration patterns, author influence, and the impact of scientific publications. By using bibliometrics, researchers can explore existing literature, identify research trends and gaps, and support decision making in academics and research.

The analysis carried out using the bibliometric method has another term, namely a term known as scientometrics. Bibliometrics is carried out with the aim of knowing the contents of an earlier literature (Ciano, 2019; Corte, 2019). Analysis using bibliometrics can provide a mapping of the relationships that exist in previous studies regarding the researchers as well as the emergence of data and can be used to find out the novelty of research that is currently trending regarding the development of YouTube social media which is used as a learning medium (Batistič, 2019; Casado-Aranda, 2021).

Bibliometrics is continued by using software called vosviewer. Viosviewer is used to be able to visualize data that has been selected by researchers and has been previously published. The vosviewer software is useful for researchers to be able to manage published databases and related networks (Aristovnik, 2020; Caviggioli, 2019).

VOSviewer is software or software used to analyze and visualize bibliometric data. This software is specifically designed to process bibliographic data and produce informative and interactive visualizations. VOSviewer can be used to analyze collaboration patterns, identify topic clusters, map citation networks, and visualize relationships between items or entities in bibliometric datasets. In a bibliometric context (Cavaggioli, 2019; X. Chen, 2020), VOSviewer allows users to import bibliographic data from various sources, such as text files or bibliographical databases such as the Web of Science or Scopus (Bouzembrak, 2019; Dabić, 2020). Users can set analysis parameters, such as selecting data processing methods and setting thresholds for filtering data After the data is loaded (Bartolini, 2019, 2019),

One of the main features of VOSviewer is its ability to generate network visualizations. This network visualization depicts the relationships between entities in the dataset, such as authors, articles, or keywords (Bonilla-Aldana, 2020; Dabić, 2020). VOSviewer uses a special algorithm to depict entities as nodes and the relationships between entities as links or edges. In this visualization, entities that have a close relationship will be placed closer to each other (Cavaggioli, 2019; Corte, 2019), while entities that have a weak relationship will be placed further away. VOSviewer also supports various visualization methods that can assist in data interpretation. For example (Asokan, 2019; Bartolacci, 2020), the software can generate cluster maps, where closely related vertices will be grouped together in separate clusters. In addition,

Using VOSviewer, researchers can easily analyze and visualize their bibliometric data, gaining deeper insights into patterns (Anand, 2021; Baier-Fuentes, 2019), relationships, and trends in the scientific literature. The visualizations generated by VOSviewer help in better understanding the complexity of bibliometric data, as well as enable users to identify patterns of collaboration, related research topics (Bonilla-Aldana, 2020; Y. Chen, 2022), or focuses of attention in the literature. In addition (Asokan, 2019; Bouzembrak, 2019), VOSviewer also supports interactive features that allow users to explore visualizations (Demiroz, 2019; Dhamija, 2020), zoom in and out of certain parts (Anand, 2021; Casado-Aranda, 2021), and access detailed information about the entities or relationships involved (Cavaggioli, 2019; Corte, 2019).

This feature provides greater flexibility and exploratory capabilities for users in exploring and understanding their bibliometric data. In conclusion, VOSviewer is a software used in bibliometric analysis to process (Corte, 2019; Dabić, 2020), analyze and visualize bibliographic data. Through its network visualization features and flexible analysis options (Bouzembrak, 2019; Dabić, 2020), VOSviewer helps researchers extract insights from their bibliometric data (Baas, 2020; Benita, 2021), identify collaboration patterns (Ante, 2021; Asokan, 2019), and understand relationships and trends in the scientific literature (Bartolini, 2019; Dabić, 2020).

Vosviewer currently with its popularity can well be able to provide a mapping of the types of analysis that can support the database to find out the network (Benita, 2021; X. Chen, 2020). There are several ways to use the Vosviewer application (Alnajem, 2021; Corte, 2019), namely by importing data and viewing the map The data that has been collected is formatted into the RIS format to be processed using the vosviewer software Based on the background described by the researcher (Ciano, 2019; Colares, 2020). Researchers have decided to use data accessed through publish or perish and use VOSviewer software to collectively analyze YouTube globally (Y. Chen, 2022; Corte, 2019). Researchers carry out a study with the title "Bibliometric Analysis of Youtube Platform Research Trends Using the Vosviewer Application" (Baas, 2020; Baker, 2020).

## RESEARCH METHODOLOGY

The research method used in this study is a descriptive method where an analysis will be carried out on a data that has been collected with the help of publish or perish software. All articles were obtained from the Google Scholar database which was retrieved on May 10, 2023 with the keywords "Youtube Learning Media" (Aparicio, 2019; Benita, 2021). The articles used are articles that have a range of research years in 2018 – 2023. Then the articles are exported in RIS file format. Furthermore (Batistič, 2019; Dabić, 2020), the articles are inputted into the VOSviewer software so that they can be analyzed using bibliometric analysis. With the help of VOSviewer software (Dabbagh, 2019; Dabić, 2020) (Anand, 2021; Bartolacci, 2020), research can be made easier to be able to classify articles that have been used (Asokan, 2019; Baker, 2020).

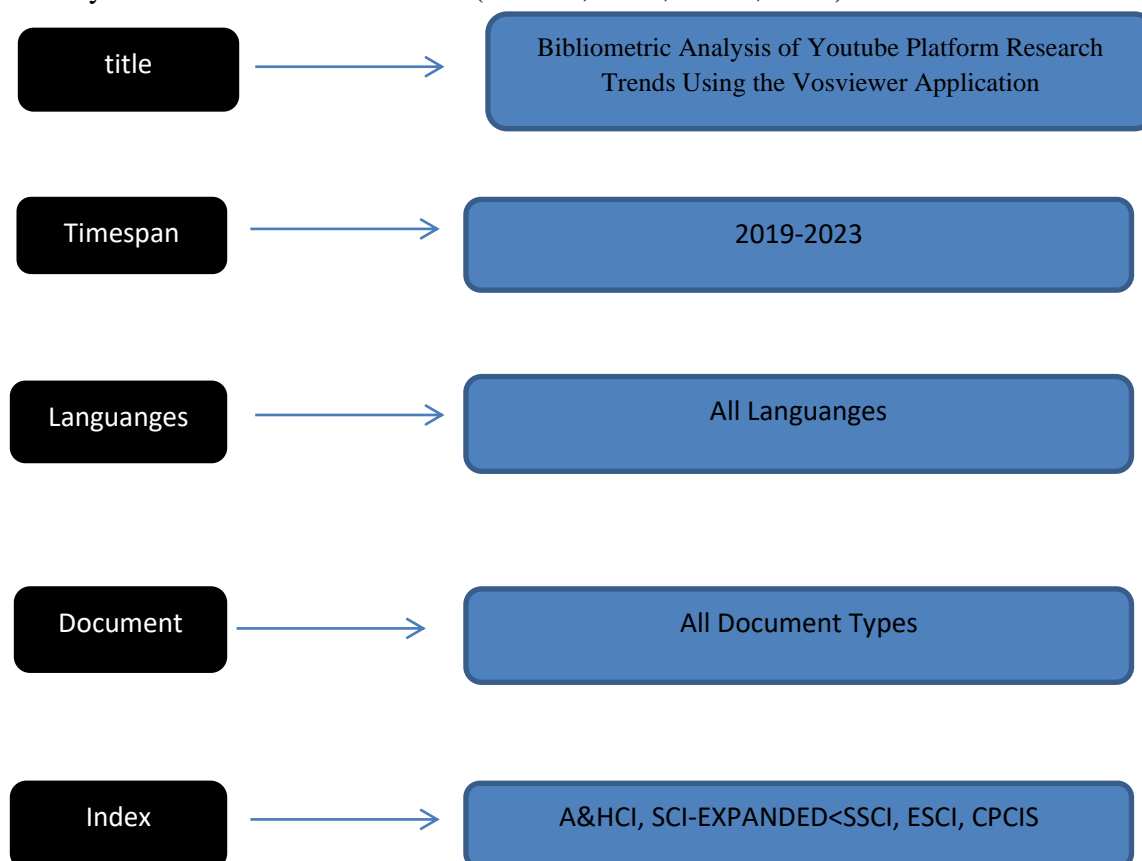


Figure 1. descriptive method flow

Based on the picture in the data quarry above (Caviggioli, 2019; Danvila-del-Valle, 2019), it is known that a research title has been determined (Ardito, 2019; Benita, 2021), namely bibliometric analysis of research trends on the YouTube platform using the Vosviewer application. With the criteria for research time in 2019-2023 (Amin, 2019; Benita, 2021). The research was carried out using descriptive methods (Ante, 2021; Batistič, 2019).

## RESULT AND DISCUSSION

The existence of YouTube learning media can provide convenience in the field of education. Students are very loose about learning because learning videos can be accessed easily without using fees. YouTube media makes learning very fun and not monotonous. Based on this matter, it is known that student learning outcomes also increase due to the existence of learning media through YouTube.

The use of YouTube learning media has brought many benefits in the field of education including:



1. Easy accessibility

YouTube provides easy and fast access to a variety of learning videos. Students can freely access learning videos anytime and anywhere, as long as they have an internet connection. This reduces geographical and time limitations in the learning process.

2. Low cost

YouTube provides a free platform for publishing and accessing learning videos. Students do not need to pay additional fees to access learning materials provided on YouTube. This helps reduce the financial burden on students and educational institutions.

3. Learning variety and creativity

In video form, learning material can be presented in an interesting and creative way. Teachers or educational content creators can use different visual elements, animations, music, and presentation styles to make learning more interesting and less monotonous. This can help retain students' attention and increase their motivation in learning.

4. Independent learning

Through YouTube, students can study independently by following learning videos according to their own learning needs and pace. They can loop the video, stop or replay certain parts that are hard to understand. This flexibility allows students to study at their own pace and feel more comfortable understanding the learning material.

5. Access to global resources

YouTube offers access to learning videos created by teachers, educational institutions and experts around the world. Students can draw on this diverse knowledge and perspectives to broaden their understanding of certain topics and gain new insights. It can also enrich their learning experience.

Through the use of YouTube learning media, students can experience increased learning outcomes. In the right approach, by providing effective and quality learning videos, YouTube can be a valuable tool in supporting a fun, interesting and effective learning process. However, it is important to note that the use of YouTube in education must also be balanced with appropriate learning strategies, supervision and evaluation to ensure that students get the maximum benefit from the learning experience through the media.

In this study, the researcher wanted to know about the research trends found on the YouTube platform. It is known that researchers have determined the year of research, namely 2018-2023, where articles have been published that have a discussion about the YouTube platform, which has a very large number, many and wide. Students' interest in learning when using the YouTube platform has also greatly increased because given the problem-solving abilities contained in learning, it can be obtained based on the results of YouTube videos that have been observed by students. The researcher has determined the keyword "Youtube Learning Media" and carried out a search with the help of publish or perish.

This study aims to analyze research trends related to the YouTube platform in the period from 2018 to 2023. Researchers have determined the focus of discussion on the YouTube platform which has a significant, large, and extensive amount of research. Researchers are also interested in understanding the increase in student interest in learning associated with the use of the YouTube platform.

In this study, researchers used the keyword "YouTube Learning Media" as a reference for conducting a literature search. To obtain relevant and up-to-date data, researchers use search tools such as "Publish or Perish". This tool helps researchers in finding scientific articles that have been published and are relevant to the topic under study.

Through an analysis of the articles that have been found, the researcher hopes to identify research trends regarding the use of YouTube as a learning medium. In addition, researchers also seek to evaluate the impact of using the YouTube platform on students' interest in learning, especially in terms of problem-solving skills that can be obtained through the videos presented on YouTube.

Thus, this study aims to provide a deeper understanding of research developments related to the YouTube platform as a learning medium, as well as the implications for student interest in learning. It is hoped that the results of this research can provide new insights and valuable information for educational practitioners, curriculum developers, and educators to effectively utilize the potential of the YouTube platform in the learning process.

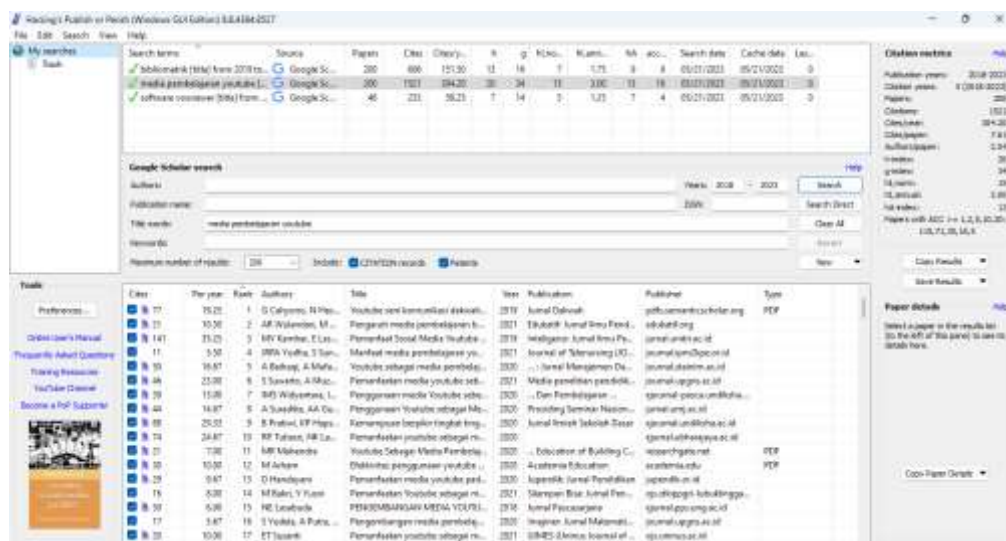


Figure 1. Define keywords and perform a search

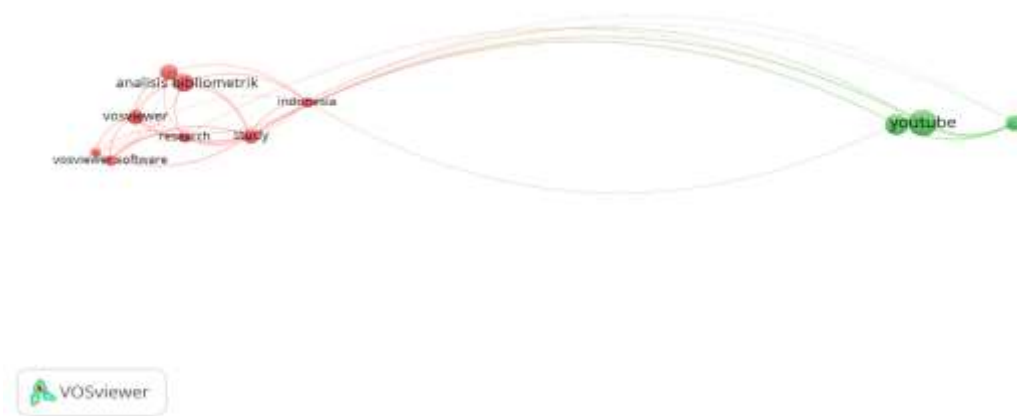
The next step is to use the VOSViewer software to be able to find out the results of the visualization of the articles that have been found by researchers. The following is the result of data mapping based on VOSViewer. VOSviewer is software used for visualization and analysis of bibliometric data. This software allows researchers to analyze and visualize patterns of relationships between scientific articles, authors, keywords, and related research topics. By using VOSviewer, researchers can import bibliographic data that has been collected from articles found in their research. This software will process the data and produce informative visualizations in the form of network or cluster maps.

Through the resulting visualization, researchers can see the relationship between scientific articles based on the similarity of topics, collaboration between authors, or the level of relationship between keywords used in the research. This visualization can help researchers gain a better understanding of research trends, research centers, and the relationships between existing topics.

Using VOSviewer, researchers can visually explore the bibliometric data they collect, identify important patterns, and generate new insights into research.

Figure

2.



### Network Visualization

Network Visualization is a technique or method for visualizing data related to network forms or relationships between entities. In a research context, network visualization is used to describe and analyze relationships between entities such as scientific articles, authors, keywords, or research topics. In network visualization, entities are represented as nodes, while the relationships between these entities are represented as links or edges. This visualization can be in the form of graphs, maps, or diagrams that show the relationship between nodes in the network.

Network visualization has several important benefits in data analysis, especially when dealing with complex and related data. Understanding the relationships and interactions between entities: Network Visualization helps in visualizing and understanding the relationships between entities in a system or network. This helps identify patterns, structures, and dependencies between entities that can be difficult to understand through raw data alone. Cluster and group recognition: Using Network Visualization, clusters and groups can be easily identified. This helps in grouping entities that have a strong relationship or similar characteristics.

Centrality and connectedness analysis i.e. Network visualization allows measurement of the centrality and connectedness of entities in the network. This can help in identifying entities that have a large influence or important role in the network. For example, in social analysis, network visualization can help identify individuals who have many connections or who act as a link between groups. Anomaly detection and hidden patterns Through Network Visualization, hidden patterns or anomalies in the network can be found. Good visualization allows the user to quickly recognize unusual or eye-catching entities or relationships. This helps in detecting events or patterns that might not be apparent in raw data or traditional analysis.

Better communication and understanding, Network visualization helps in communicating analysis results effectively to others. In a visual form, complex information can be presented in an easy-to-understand and attractive way. This allows for more effective sharing of findings with



different audiences and helps build a better understanding of network structure and dynamics. By using Network Visualization, we can extract deeper insights from network data, identify important patterns and relationships, and visualize information in ways that are easy to understand and communicate. It is a very useful tool in data analysis involving interactions and relationships between entities.

Through network visualization, researchers can gain insight into network structure, patterns of relationships between entities, the level of centrality or importance of certain nodes, as well as groups or clusters of entities that are interrelated. This helps researchers understand the patterns and relationships that exist in their research data, as well as identify emerging trends, centers of research, or major themes. By using network visualization techniques, researchers can visually explore and analyze their data, assist in decision making, and generate new insights that can be used for further research development.

Based on the results of the Network Visualization generated from VOSViewer, it was found that there were 11 items analyzed in the dataset. Based on this analysis, there are 2 clusters that can be identified. There are also 35 relationships between these items, with a total link strength of 391.

Based on the results of the Network Visualization generated from VOSViewer, there are 11 items analyzed in the dataset. Network Visualization visualizes the relationship between these items in the form of a network or graph. In this analysis, there are 2 clusters that can be identified. Clusters are groups of items that are connected or have something in common. In this context, the resulting clusters may reflect certain groups or topics related to the items in the dataset.

Furthermore, there are 35 relationships between the items analyzed. This relationship indicates a relationship or interaction between these items. The total link strength of 391 indicates the extent to which the items are linked or strongly connected. Link strength can reflect a variety of factors, such as the frequency of interactions, the strength of the correlation, or the degree of similarity between the items.

Overall, the Network Visualization results from VOSViewer show that there are 11 items analyzed, 2 clusters identified, and 35 relationships between these items. Based on the results of the Network Visualization that has been mentioned, there are several things that can be seen, including the number of items analyzed, there are 11 items analyzed in the research conducted by the researcher. These items can refer to scientific articles, keywords, or other entities that are the focus of research. Identification of 2 Clusters, namely in the network that has been analyzed, there are identification of 2 clusters or groups of entities that are interrelated. This cluster shows that there is a stronger relationship between entities in the same cluster compared to entities in other clusters.

The relationship between items states that there are 35 relationships between the items analyzed. This relationship can mean the link between scientific articles and keywords, or the link between one scientific article and another. This relationship provides an overview of how the items in the study are interrelated and form a network.

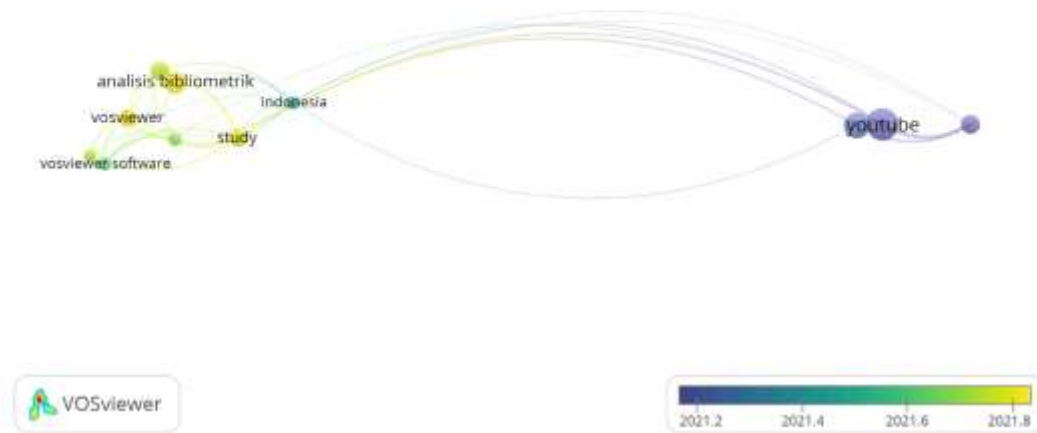


Figure 3. Overlay Visualization

Overlay Visualization is one of the visualization methods used in network or graphical analysis. This method is used to highlight or display additional information on the network being analyzed by changing the attributes or visual appearance of a particular entity or relationship. In the research context of researchers who use VOSViewer, Overlay Visualization can be used to provide additional information on the network that has been generated. For example, Researchers can use Overlay Visualization to give different colors or icons to entities belonging to different clusters. This will assist researchers in visually distinguishing these entities and understanding the groups or themes that are formed. Besides that, Overlay Visualization can also be used to display additional attributes on entities or relationships, such as importance, centrality, or other factors relevant to the Researcher's analysis. By using this attribute, researchers can see certain characteristics or patterns in the network more clearly and easily understood.

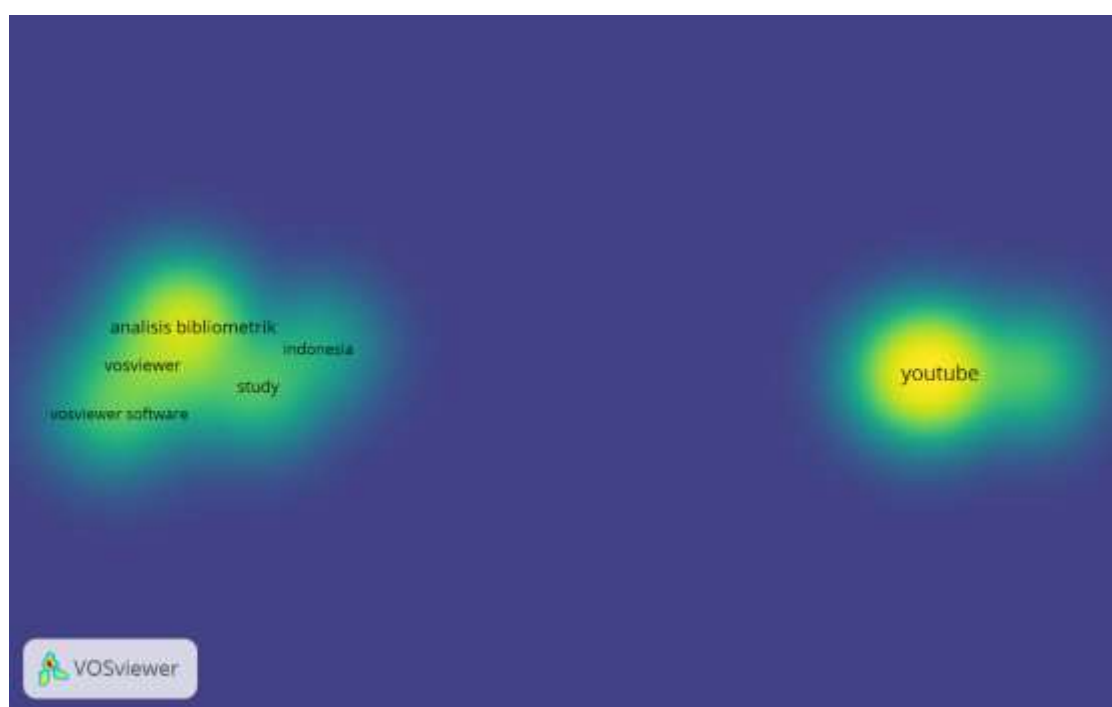
By using Overlay Visualization, researchers can dig deeper and get richer insights about the relationships and characteristics in the network that they are analyzing. The purpose of using Overlay Visualization in network analysis is to provide additional information that can enrich understanding and interpretation of the relationships between entities in the network. Some specific purposes for using Overlay Visualization include differentiating groups or clusters. Overlay Visualization can be used to provide a different visual appearance to entities belonging to different clusters or groups. This makes it easier to visually identify these groups and understand their characteristics and interactions between them.

Highlighting important attributes Overlay Visualization can be used to highlight certain attributes or characteristics of entities or relationships that are relevant to the analysis being performed. For example, Researchers can assign different colors to entities that have a high level of importance, or assign researchers to entities that have a central role in the network. This helps researchers in identifying entities or relationships that have a special role in the network. Displaying additional information Overlay Visualization can also be used to display additional relevant information on entities or relationships in a network. This information can be in the form of qualitative or quantitative attributes such as labels, values, or categories that add to the understanding of each entity or relationship.

Identify patterns or relationships Overlay Visualization can assist in identifying specific patterns or relationships in a network. For example, by using Overlay Visualization, Researchers can see the extent to which entities related to a particular topic interact with each other or how the relationships between groups in a network are. Thus, the purpose of using Overlay Visualization is to provide a richer and more informative visualization of the relationships in the network, thus facilitating deeper understanding and analysis.

Based on the Overlay Visualization from VOSViewer, it was found that there are 163 items related to "YouTube". From this analysis, there are 2 clusters that can be identified. There are also 5 links between items related to "YouTube", with a total link strength of 152. This indicates a connection and interaction between the items.

Based on the results of the analysis obtained from the researcher, it is known that there are 2 clusters. Clusters are groups or groups formed by items that are interrelated or have something in common. In this context, the resulting clusters may reflect certain topics or types of content related to "YouTube". In addition, there are also 5 relationships between items related to "YouTube". This relationship can mean that there is a relationship or interaction between these items. The total link strength of 152 indicates the extent to which the items are related or connected to one another. Link strength can reflect the frequency or strength of interaction between the items, such as the number of links, comment engagement, or references between them.



The average year of publication of items related to "YouTube" is 2021. This indicates that most of the items in the dataset relate to 2021, based on the results of the analysis it is known that there has been an increase in interest or research related to YouTube in that year. The analysis shows that the average publication year of "YouTube" related items is 2021. This indicates that most of the items in the dataset relate to the year 2021. This finding indicates an increase in interest or research related to YouTube in that year.

The reasons for increased interest or research related to YouTube in 2021 can be varied. Some of the factors that may have contributed include the increasing popularity and use of the YouTube platform as a source of information, learning media, entertainment or as a marketing tool. Another possibility is that there are technological developments and accessibility that make it easier for people to create and share content on these platforms. The results of this analysis provide important insights into understanding research trends related to YouTube and also demonstrate the relevance and importance of the platform as a research focus in 2021.

## CONCLUSION

Based on the research conducted, it can be concluded that the existence of YouTube learning media provides convenience in the field of education. Students can conveniently access learning videos at no additional cost. YouTube media also makes learning more fun and less monotonous. In this study, researchers wanted to know research trends related to the YouTube platform from 2018 to 2023. In a search using the keyword "YouTube Learning Media" with the help of the VOSViewer software, 11 articles were found that were analyzed. The visualization results show that there are 2 clusters and 35 relationships between these articles, with a total link strength of 391. In addition, in the dataset found, there are 163 items related to "YouTube". There are also 5 links between items related to "YouTube", with a total link strength of 152. This indicates a connection and interaction between the items. Also, the average year of publication of "YouTube" related items is 2021. This indicates that most of the items in the dataset relate to the year 2021, possibly due to increased interest or research related to YouTube in that year. Density visualization can also provide an idea of the distribution of items related to "YouTube" in the dataset. The conclusion that can be drawn is that YouTube learning media has a positive influence on ease of access, student interest in learning, and improving learning outcomes.

## AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

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