



A META-ANALYSIS OF THE FILTER BUBBLES ON SOCIAL MEDIA: RESEARCH NOVELTY AND ITS IMPLICATIONS FOR UNDERSTANDING THE CHARACTER OF PANCASILA

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ABSTRACT

The phenomenon of filter bubbles on social media disrupts a comprehensive understanding of Pancasila and triggers opinion polarization that threatens national unity in Indonesia. This study aims to examine the development of research related to the filter bubble phenomenon by utilizing a meta-analysis literature study method. The data sources used are Google Scholar, with the application Publish or Perish to identify research trends. Further, novelty analysis of the research was conducted using the VOSviewer application. The search was conducted on international journal publications indexed by Google Scholar using the keywords "filter bubble, social media" from 2013 to 2023, and a total of 985 articles were found. Findings indicate that publications related to this topic have seen a relatively high increase from 2013 to 2023, suggesting a potential trend for increased research interest in the coming years. From the data obtained, results indicate that there are several interesting topics as research novelties, including filter bubbles on social media and their implications for the distortion of understanding Pancasila's character. The implications of the Filter Bubble phenomenon on the understanding of Pancasila's character create significant challenges in efforts to build strong national awareness and identity in Indonesia. Filter bubbles narrow access to information, potentially reducing a comprehensive understanding of Pancasila and triggering opinion polarization that threatens national unity. Further research is needed to examine the mechanisms of filter bubbles and mitigation strategies to strengthen understanding of Pancasila and build inclusive national solidarity. Additionally, this article is also important as a source of data for the development of research on the topic of filter bubbles.

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1. INTRODUCTION

In the era of increasingly rapid digital information, social media has become one of the main sources of information for many people. Its presence allows individuals to connect with various content, news, and views from around the world (Ahmed, 2020; Lee, et al., 2016; Putri, et al., 2024). However, behind this convenience and wide access comes the phenomenon of filter bubbles, which is a serious concern in the context of social and political dynamics. The filter bubble, which is the result of information curation by social media algorithms to present content that matches user preferences, has led to various debates about its impact on opinion diversity, opinion polarization, and social stability (Daus, 2024; Ekström, et al., 2022). Unfortunately, the reality is that social media utilization and technological development have affected people's lives, both positively and negatively (Hafiz, et al, 2021; Tuli, et al., 2021). Social media enables new interactions that were previously unavailable to ordinary people, but are often misused, negatively impacting public opinion, social, political and cultural issues. This phenomenon has an impact on distorting the understanding of the character of Pancasila, especially among the younger generation (Rakhmah, 2021).

The use of the internet in Indonesia has increased every year, the results of a survey conducted by the Association of Indonesian Internet Service Providers (APJII) noted that in 2016 as many as 132.7 million people became active internet users from the total population of Indonesia 256.2 million people (Association of Indonesian Internet Service Providers, 2016). In 2017, it increased to 143.26 million active internet users out of a total Indonesian population of 262 million people (Asosiasi Penyelenggara Jasa Internet Indonesia, 2017). In 2018, there was another increase of 171.17 million active internet users from the total population of Indonesia 264.16 million people (APJII, 2019). In 2019 to 2020, it increased again to 196.71 million internet users from a total population of 266.91 million Indonesians (Association of Indonesian Internet Service Providers, 2020). It is predicted that it will continue to increase along with the completion of the palapa RING network project which will increase the reliability of connections throughout Indonesia.

The results of research by HootSuite and social marketing agency We Are Social state that internet users in Indonesia are aged 16 years to 64 years with an average time surfing online for 7 hours 59 minutes, which exceeds the average time of people in the world who surf online for 6 hours 43 minutes per day using the internet. The social media platforms that are frequently visited by internet users in Indonesia include Youtube, WhatsApp, Facebook, Instagram, Twitter, Line, Messenger, LinkedIn, Pinterest, and Wechat. These various social media platforms are used by the public and the millennial generation only to socialize and become a new public space for interaction and even political participation (Hootsite and We are social, 2021; We Are Social and Hootsuite, 2020).

Deep concern when Microsoft released the results of the Digital Civility Index (DCI) research in early March 2021. This Microsoft research measures the level of politeness of internet users throughout 2020. The results are quite shocking, Indonesian netizens are the least polite in Southeast Asia. Indonesia is 29th out of 32 countries surveyed. With these results, Indonesia is the country with the lowest level of politeness in Southeast Asia (Abiyuna, 2023; Dewi, 2021; Yayan, 2022). Various interesting phenomena to see the level of politeness of Indonesian netizens in cyberspace are summarized in several news reports, such as Indonesian netizens who are cyberbullying foreign artists Han So Hee from South Korea just because they are carried away by emotions into the real world from a drama film entitled "The World of The Married". Furthermore, Indonesian netizens are acting again, Reemar Martin, an influencer from the Philippines, became a victim of cyberbullying because he was jealous that many Indonesian men idolized him because he was beautiful (Kompas.com, 2020). Finally, on April 4, 2021, Indonesian netizens took action again by cyber bullying a gay bride from Thailand (Anandawati, 2021).

Research on Filter Bubble is not the first time research has been conducted, previously there were researchers who had conducted similar research. Like Wulandari et al. (2021) who conducted a study entitled The effect of the bubble filter algorithm and echo chamber on internet usage behavior, with the results of the study saying that it is true that bubble filters and echo chambers can affect the scope or ecosystem of internet users. This can be seen from the way the algorithm system provides unique content to each user. In terms of influence and impact, between filter bubbles and echo chambers can both have a positive and negative impact on internet users, it can even be said that each impact has an equally large influence.

Furthermore, Bustanur et al. (2022) with the title Analysis of The Filter Bubble Algorithm in The Search for Information on The Internet states that the filter bubble effect in the context of information society in the cyber-religion era can be an obstacle to the realization of religious moderation. This is because realizing religious moderation requires a comprehensive understanding of religion. At the same time, the filter bubble effect can inhibit Internet users from the full flow of information by isolating users in "information bubbles" for personalization. The inhibition of religious moderation due to the filter bubble effect can be described through two conditions: 1) hyper-rationality; and 2) echo chamber.

Furthermore, Indriani et al. (2020) with the title Analysis of The Filter Bubble Phenomenon in The Use of Online Media for Millennial Generation (An Ethnography Virtual Study about The Filter Bubble Phenomenon) explained the results that most informants did not know the term 'Filter Bubble', but had assumed it for a long time. When they understand the term better, they realize that they need to be more critical of what they read, and literacy is an important competency in this era. Although, aside from whether or not this filter bubble can build their identity, some deny that it has any relevance while others seem to think it provides some additional value in it. The additional values that are imprinted on the way people perceive information today, might as well be within the filter bubble itself when discussing the filter bubble phenomenon.

The bubble filter is becoming increasingly important due to its possible impact on reducing information diversity, strengthening opinion polarization, and even threatening national unity by narrowing exposure to diverse viewpoints. In Indonesia, the implications of the bubble filter on the understanding of the character of Pancasila, as the foundation of the state, pose significant challenges in the effort to build strong national awareness and identity.

Although several studies have been conducted to examine the filter bubble, there is still a need to further investigate the mechanisms behind this phenomenon and develop effective mitigation strategies. In-depth research on the filter bubble can provide valuable insights to strengthen the understanding of Pancasila values and build inclusive national solidarity in Indonesia.

Thus, the filter bubble phenomenon is a complex challenge that needs to be studied in depth, including through a careful literature study. Through this literature review approach, we can generate a deeper understanding of this phenomenon and find potential research novelty that can provide new answers to existing problems. Thus, innovations in understanding and addressing the impact of filter bubbles may emerge, paving the way for more effective and inclusive solutions to the challenges presented by the dynamics of modern social media including the phenomenon of filter bubbles by exploring its implications for understanding the character of Pancasila and offering contributions in the development of relevant mitigation strategies. It is hoped that this research will provide a deeper understanding of the filter bubble as well as lead to more effective measures in promoting national unity and integrity in Indonesia.

2. METHOD

This research employs the literature study method by gathering metadata from Google Scholar as the primary data source to support a comprehensive understanding of the research topic. A literature review, as noted by (Lim et al., 2022), functions to summarize and synthesize existing academic work within a particular discipline and can be undertaken either as a component of a conceptual or empirical project or as an independent scholarly investigation. Google Scholar was selected as the academic database due to its provision of easy access to data commonly utilized in research and writing, such as titles, abstracts, and authors' keywords, which enhances researchers' understanding of the complexity and diversity of the scientific system (Hafidh et al., 2023). To facilitate and streamline the data collection process, the Publish or Perish application is utilized, which significantly simplifies the search and filtering of publications indexed in Google Scholar (Husaeni & Nandiyanto, 2022). Through this application, citation data is retrieved efficiently and subjected to analysis to generate relevant and meaningful statistical information (Nugraha et al., 2023; Aulianto et al., 2019).

In this study, the keywords "filter bubble, social media" were employed to search for journal publications indexed between 2013 and 2023, ultimately resulting in a collection of 985 articles that were deemed relevant to the research focus. The collected metadata was then processed using Publish or Perish and saved in .csv format to enable further detailed analysis through Microsoft Excel. During the analysis phase, patterns and thematic trends emerging from the data were carefully identified and examined to reveal deeper insights into the existing body of knowledge. The findings from this analysis are subsequently presented narratively in the research results section, providing a coherent overview of the current state of research. Furthermore, a novelty analysis was conducted using the VOSviewer (Visualization of Similarities) application, which allowed for the visualization of keyword networks and identification of new and emerging research topics that hold potential for future academic exploration and contribute to the advancement of knowledge in this field. VOSviewer is a tool used to visualize the results of article searches based on specified keywords. The steps for utilizing VOSviewer, as explained by (Herdianto et al., 2021) in (Ajinegara and Soebagyo 2022), include: first, determining the keywords to be used in the search process; second, conducting the article search based on those keywords; third, filtering and processing the search results to match the research needs; fourth, collecting and organizing the statistical data obtained from the search; and fifth, performing bibliometric analysis to understand the relationships between topics and to identify emerging research trends. By using VOSviewer, we can create a broad bibliometric map in a simple way, making it easier to understand the existing relationships (Kurnia, 2021).

3. RESULTS AND DISCUSSION

3.1 Understanding Filter Bubble

The bubble filter was first introduced by Eli Pariser in 2011 at a TED Talks seminar in California. Pariser defines the bubble filter as an environment where the information we see on the internet is increasingly personalized, so that we are more often exposed to information that matches our beliefs (Azizi, 2023; Pariser, 2011b). This concept shows how individuals on the internet can be trapped in an information environment that only reflects their own views and preferences. The bubble filter algorithm works by providing similar content based on user behavior on the internet, such as liking posts, sharing, commenting, clicking on certain links, and user search history (Wulandari et al., 2021). Pariser (2011a) realized the existence of this algorithm after analyzing his friends' posts on Facebook, where the system displayed posts from liberal-leaning friends more often than conservative ones. This happens because the system's algorithm knows the topics that users often click on in Facebook. This algorithm is widely applied in social media and serves as a filter in the search for information in the midst of a flood of information flow. The information that appears is the result of relevance to the topic searched and the context of a particular issue (Geschke et al., 2019). Hartono (2018) stated that bubble filters are algorithms created to facilitate searches on social media, especially Facebook, and help advertisers target their target market. Haim et al. (2017) added that instead of ensuring diversity, this algorithm aims to maximize economic benefits by increasing media consumption.

Bubble filters also can reinforce ideological segregation by recommending content that matches the user's views. As a result, users may only be exposed to certain viewpoints, reinforcing polarization and limiting access to diverse information. This can increase social anxiety and tension (Flaxman et al., 2016; Wulandari et al., 2021). Irawan (2022) identified three characteristics of filter bubbles on social media. First, algorithms collect and analyze

data from user habits through digital footprints such as search history, clicks, and location. Second, it creates an echo chamber effect on the home page or timeline of social media. Third, the personalization of content by algorithms causes a distortion of the heterogeneity of the content that appears. Although bubble filters provide convenience, there are new threats in the form of positive and negative impacts for internet users. Social media users tend to search, click and like certain content. This data is recorded by algorithms that then present information based on these digital footprints, both through Google Search and platforms such as YouTube, Instagram, Facebook, and Twitter (Paramita et al., 2019). These algorithms herd individuals with similar views into the same information space, including believing in fake news. This phenomenon is called the "mobocracy algorithm" which gives power to the mob or crowd, so that the bubble filter increasingly directs users to only see certain points of view (Wibowo, 2017; Simon, 2020).

From the description of the filter bubble concept, the author identifies several negative impacts for internet users. First, perspective limitation where users are only exposed to certain viewpoints, making it difficult to understand different views. Second, polarization of opinions that reinforces hatred and incomprehension between groups. Third, information limitation as the filter bubble limits access to diverse information. Fourth, the spread of false information is amplified as users are more exposed to unverified content. Fifth, heightened social anxiety and tension as the bubble filter reinforces polarization and limits understanding.

To overcome the filter bubble, the first step is to expand your sources of information. In addition to following mainstream media, it's important to find alternative sources of information with different viewpoints. Listening to podcasts, reading books or following blogs with different viewpoints can help. Interacting with people who have different views is also important. Healthy and open discussions help to see issues from different perspectives. It is also important to maintain a critical attitude towards the information received. Before trusting or sharing information, make sure it is valid and comes from a reliable source. Maintaining awareness of the filter bubble and trying to break out of it is important to gain a better understanding of the world and society around us (Zaman, 2023).

3.2 Data Search Results

The results showed that over a 10-year period from 2013 to 2023, there were a total of 985 international journal articles focusing on the topic of "filter bubble, social media". Of these, the articles have been cited 54,494 times, with an average citation per year of 4,954, and an average citation per article of 54.82. Each article author has an average of 598.01 articles related to this topic, with an average of 2.27 authors for each article. The H-index for this topic is 100, indicating a significant level of impact in the scientific literature. In addition, the g-index of 218 indicates that 218 articles are most frequently cited in this topic. The normalized h-index is 68, and the annual h-index is 6.18, while the hA-Index is 37. This analysis provides a clear picture of how significant the topic of "filter bubbles" is in the scientific literature and how it affects the direction of research and understanding in the field. Analysis of the number of publications in each year shows a consistent upward trend from 2013 to 2023 (see Figure 1). At the beginning of this period, the number of publications remained relatively stable at around 20-50 publications per year. However, starting in 2017, there was a significant increase in the number of publications, with the increase continuing until 2023.

The year-on-year increase in the number of publications may reflect an increased interest and awareness of the filter bubble phenomenon among researchers. This may be due to increased attention to the role of social media and information curation in shaping individuals' perceptions and access to information. This trend also reflects the importance of bubble filters as a relevant and interesting research topic in various disciplines, including computer science, sociology, and political science. With a significant increase year on year, it can be concluded that bubble filters are becoming an increasingly important and prominent subject of debate in the academic literature.

The graph depicts a significant increase in the number of publications on bubble filters from 2013 to 2023 (see Figure 1). This deviation indicates that the bubble filter phenomenon has become an increasingly important and interesting research subject for scholars. This increased interest reflects an awareness of the important role social media plays in shaping the way we interact with information, as well as its impact on individuals' perception and access to information. As the number of publications increases, this suggests that there is a growing need for a better understanding of the filter bubble and its impact in various aspects of life. Researchers need to continue to develop innovations in research methodologies, mathematical modeling and data analysis techniques to better understand the dynamics of the filter bubble. These innovations are essential to address the complex challenges posed by the filter bubble, as well as to create effective solutions to promote healthy and pluralistic access to information. Therefore, this increase in the number of publications also emphasizes the need for interdisciplinary collaboration to develop a holistic approach to understanding and addressing the filter bubble phenomenon. By linking academic analysis with relevant practices and policies, we can create more effective strategies in managing the impact of filter bubbles in society.



Fig. 1 – Number of Publications on Bubble Filter Research Topics

Analysis using the VOSviewer engine shows that the concept of bubble filters has started to emerge as a separate research topic since 2018 (See Figure 2). However, the currently available definitions do not fully reflect the bubble filter phenomenon. The use of the VOSviewer engine has identified several research topics related to bubble filters, which include the concepts of filter, bubble, social media, individual, Pariser (which refers to Eli Pariser, who first proposed the concept of bubble filters), echo chamber, user, information, problem, algorithm, study, effect, addition, impact, solution, media, model, case, sequence, role, review, use, system, and analysis.

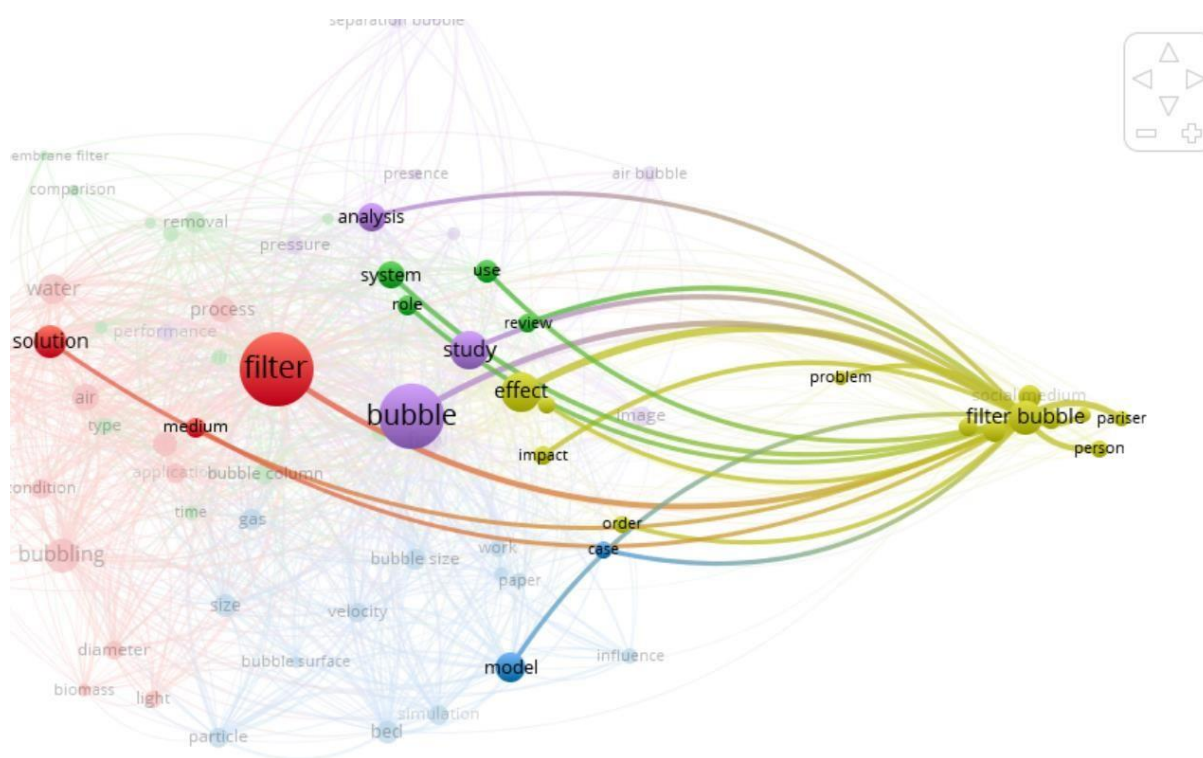


Fig. 2 – Visualization of Links Between Bubble Filter Research Topics

The importance of retaining key elements in the research topic, including filters, bubbles and social media, suggests that research is still focused on understanding how information curation by social media algorithms affects individuals' perception and access to information. Concepts such as "echo chamber" and "algorithm" highlight the important role of technology in shaping the filter bubble, while concepts such as "impact" and "solution" indicate efforts to understand the consequences and find solutions to this phenomenon. While some research topics may

still be fragmented, the identification of key elements such as "filter" and "bubble" in this analysis provides a more comprehensive understanding of the bubble filter phenomenon. In developing further research, it is important to continue to explore the relationship between these elements and consider the broader context of social media and information curation.

Trend analysis using the VOSviewer engine shows that the bubble filter phenomenon has started to grow since 2018 and has continued to increase to date (See Figure 3). The analysis shows that bubble filters have a distinct position in the topic network compared to other identified topics, suggesting that it is a relatively new topic in research and has emerged significantly since 2018. In this context, the increased research interest in bubble filters may reflect a growing awareness of their impact on social and political dynamics, as well as the need to further understand the mechanisms behind them.

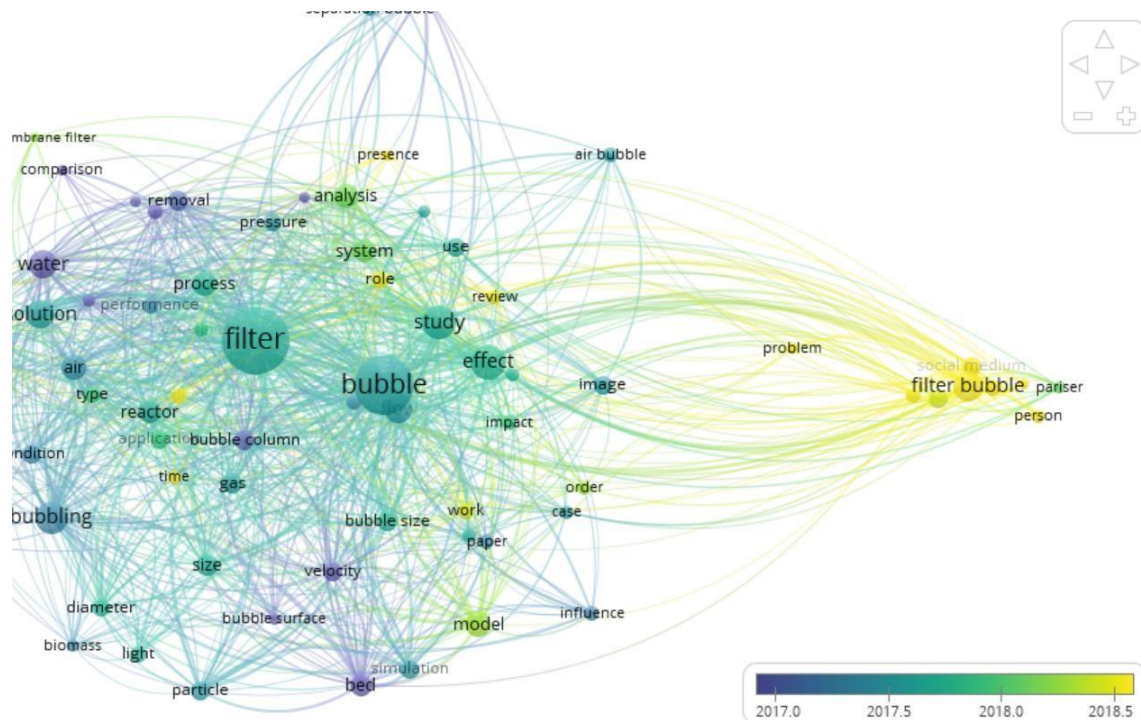


Fig. 3 – Visualization of Research Topics by Year

Although not yet fully socialized in the scientific literature, the increasing research interest in bubble filters suggests that the topic has become a subject of significant and interesting debate in various disciplines. This emphasizes the importance of continuing to explore and understand the implications of bubble filters and viewing them in the broader context of ongoing social and technological change. As such, further research in this area can provide deeper insights into the impact of the filter bubble as well as create more effective solutions in dealing with it.

From the analysis, it can be concluded that research on bubble filters has seen an increase in interest since 2018. Although the concept of bubble filters is not yet fully defined, analysis using the VOSviewer engine has identified a number of related concepts, including filters, bubbles, social media, individuals, algorithms and more. While there is still fragmentation in related research topics, awareness of the implications of bubble filters and attempts to find solutions has become an increasingly prominent focus of research. Bubble filters were also found to be a relatively new topic in research, suggesting that there is still great room for exploration and deeper understanding of this phenomenon and its implications in a broader context. As such, further research in this area will provide deeper insights into the impact of the filter bubble and help create more effective solutions in addressing the challenges it presents in an increasingly complex era of social media and information curation.

The meta-analysis shows an increasing trend in the number of publications related to the filter bubble phenomenon over the years, signaling a growing interest and awareness of the importance of this issue in the context of social media and information curation. This research successfully provides a broader understanding of the impact of the filter bubble on individual perceptions and access to information. In terms of understanding the character of Pancasila, the filter bubble has significant implications as it limits information curation to only those perspectives that suit their own preferences. This has the potential to make it difficult for Indonesians to fully understand and appreciate the values of Pancasila, which in turn can threaten the integrity and unity of the nation.

While the bubble filter poses challenges in strengthening the understanding of Pancasila characters, this research also reveals opportunities to formulate effective mitigation strategies. Understanding the mechanisms and consequences of the filter bubble allows us to develop a more holistic approach in promoting a correct understanding of Pancasila and building inclusive national solidarity. This discussion also underscores the

importance of further research in exploring the implications of the filter bubble further, as well as designing more effective mitigation strategies. This research, therefore, provides an important basis for further studies in an effort to improve understanding and appreciation of Pancasila values amidst the rapid development of information technology.

4. CONCLUSION

The conclusions of this meta-analytic study on bubble filters highlight the complexity of social media dynamics and information curation, and reveal the critical role of this phenomenon in influencing individuals' interactions with information in the digital age. The bubble filter, with its significant impact on understanding the character of Pancasila, represents a serious challenge in maintaining the national consciousness and integrity of the Indonesian nation. Lack of exposure to multiple perspectives can lead to distortions in the understanding of national values, potentially threatening the nation's identity and unity. However, the results of this study also open up opportunities to develop effective mitigation strategies by delving deeper into the mechanisms and consequences of the filter bubble. Therefore, further research is urgently needed to expand the understanding of the filter bubble and develop practical solutions that can strengthen the correct understanding of Pancasila and support the building of inclusive national solidarity amid the rapid development of information technology.

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